eddi

microgeneration energy diverter

operation and installation manual

myenergi.uk

Model No: EDDI-16A1P01

Contents

Introduction

Thank you for choosing **eddi**. Of course, we think you have made an excellent choice and are sure you will be very happy with the features, benefits and quality of this **myenergi** product.

eddi 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.

These instructions will help you to familiarise yourself with the **eddi**, by reading the instructions, you will be sure to get the maximum benefit from this 'eco-smart' device.

varisine™ Technology

varisine™ is the proprietary power control technology used in the **eddi**. The technology enables the output voltage to be very smoothly adjusted in order to alter the power to the heater. The power to the heater is always a sine wave and only the voltage is altered.

This control technology is more sophisticated than many other products on the market and the technology ensures trouble free operation with all inverters and compatibility with all import/export energy monitors and electric meters.

Safety

The device has been manufactured in accordance with the state of the art and the recognised safety standards. However, incorrect operation or misuse may result in:

(!)   Injury or death to the operator or third parties.

(!)   Damage to the device and other property of the operator.

(!)   Inefficient operation of the device.

All persons involved in commissioning, maintaining and servicing the device must:

(!)   Be suitably qualified and competent.

(!)   Have knowledge of and experience in dealing with electrical installations.

(!)   Read and follow these operating instructions carefully.

(!)   Always disconnect the device from the supply before removing the cover.

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.

(!)   Be aware that the heat sink (at the rear of the device) can on occasion reach high temperatures.

Disposal

In accordance with European Directive 2002/96/EC Waste Electrical and Electronic Equipment (WEEE) and its implementation in national law, used electrical devices must be collected separately and recycled in an environmentally responsible manner. Ensure that you return your used device to your dealer or obtain information regarding a local, authorised collection and disposal system. Failure to comply with this EU Directive may result in a negative impact on the environment.

Copyright

Copyright of these operating instructions remains with the manufacturer. Text and images correspond to the technical level at the time of going to press. We reserve the right to make changes. The content of the operating instructions shall not give rise to any claims on the part of the purchaser. We are grateful for any suggestions for improvement and notices of errors in the operating instructions.

Overview

Microgeneration systems such as Solar PV and small wind turbines are at their most efficient when the generated energy is consumed on-site rather than exporting it to the grid. This is what we call 'self-consumption'.

eddi is an energy management system for use with grid-tied PV or wind turbine systems. Excess energy from the microgenertation system is used to heat water or rooms rather than exporting it to the grid.

A grid current sensor (supplied) simply clips around the incoming supply cable. This sensor is used to monitor excess power and **eddi** automatically adjusts the voltage to the heater load, thereby consuming the surplus power. A self-powered wireless sensor (**harvi**) is available separately.

An internal expansion interface provides a means to install a Relay & Sensor Board to enable various functions such as auto switching from day-time and night-time supply, heat pump interfacing for Legionella control and temperature sensing.

eddi utilises **myenergi's** proprietary **varisine**™ technology to ensure compliance with worldwide power grid standards.

Feature Set

- 3.68KW / 16A max. heater load
- Supports two heaters (sequentially)
- Integral bypass switch
- **varisine**™ PWM technology
- Fan-less cooling
- Built-in programmable boost timers
- Energy savings data logging
- Graphical back-lit LCD screen for ease of use
- Overload and short-circuit protection
- Automatic Daylight Saving Time adjustment
- Relay & Sensor Board add-on option
- Wall mounting bracket for ease of installation
- Fully EMC and safety compliant (CE)
- 3-year warranty

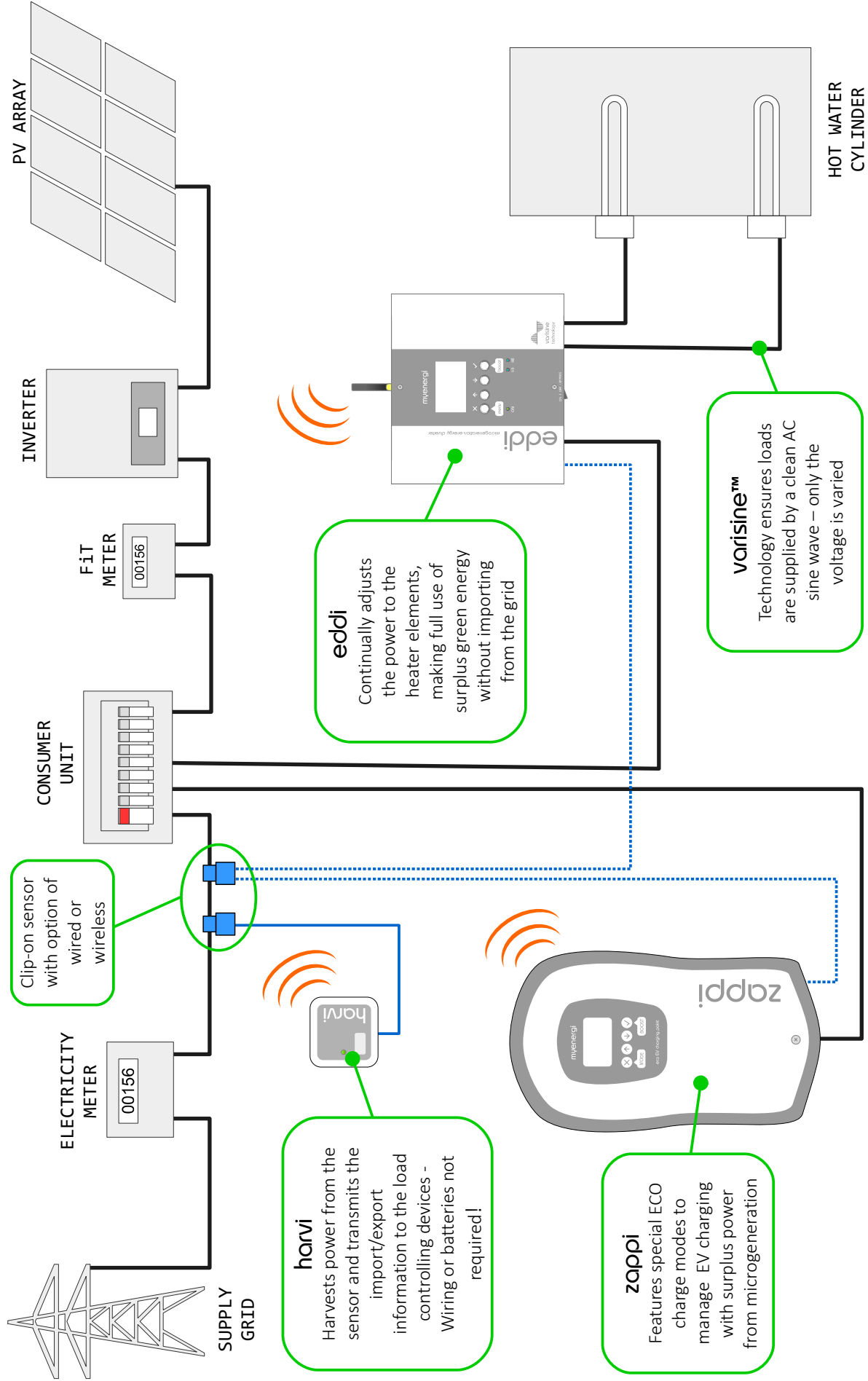## Overview Diagram

The diagram over the page, shows the **eddi** as part of a complete energy management system. Other **myenergi** products are shown and how they integrate with the grid connection and the microgeneration system.

Box Contents

- 1x **eddi** unit with mounting bracket attached
- 1x Current Transformer with 5m cable (Grid CT sensor)
- 1x Antenna
- 1x Operation & Installation Manual

Overview Diagram

PV ARRAY

INVERTER

FiT METER
00156

CONSUMER UNIT

ELECTRICITY METER
00156

SUPPLY GRID

HOT WATER CYLINDER

eddi
Continually adjusts the power to the heater elements, making full use of surplus green energy without importing from the grid

varisine™
Technology ensures loads are supplied by a clean AC sine wave – only the voltage is varied

Clip-on sensor with option of wired or wireless

harvi
Harvests power from the sensor and transmits the import/export information to the load controlling devices - Wiring or batteries not required!

zappi
Features special ECO charge modes to manage EV charging with surplus power from microgeneration

Operation
Controls & Indicators

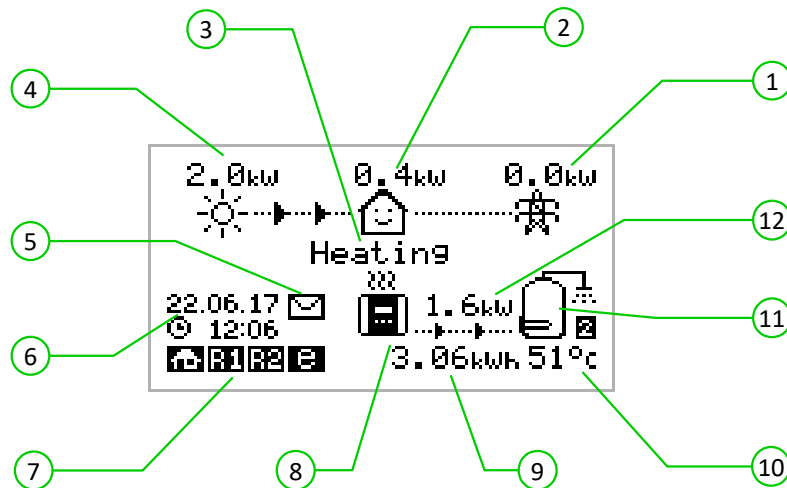| 1 | Display | Graphical LCD display with LED backlight |

| 2 | Power on indicator | Illuminates when:
Unit is connected to the mains supply and;
the BYPASS switch is in the ON position (I) |

| 3 | Control buttons | Four tactile buttons used to navigate the menus and alter settings: |

     Enter menu (from main screen)| Exit current menu

     Move up a menu item | Increase value

     Move down a menu item | Decrease value

     Boost | Select item | Confirm value and move to next setting

| 4 | Heater output indicators (1 &2) | Illuminates when the respective heater output (1 or 2) is active
The brightness will vary with the output voltage
If both 1 & 2 are lit together, both heaters are at maximum temperature |

| 5 | ON/OFF and BYPASS switch | This switch has three positions:
I   ON   - eddi is on (this is the normal position)
0   OFF   - eddi is off (the power on indicator will be off)
II   BYPASS   - eddi is bypassed; the mains supply is directly connected to the Heater 1 output. In this position the Power indicator will be off and the Heater 1 indicator will be illuminated |

Display

①	Import / Export Power	The power being either imported or exported from or to the grid (kW). The direction of the arrows indicate if the property is currently importing power (left) or exporting power (right) The size of arrows is proportion to the level of power. When the property is neither importing or exporting power, the figure will be 0.0kW and there will be no animated arrows. The property is then said to be 'in balance'
②	House Load Power	The power that the property is currently using in kW It does not include any surplus power being sent to the heater(s) *Note: This is displayed only when the Generation Sensor is installed (either connected to CT2 input or a harvi device)*
③	Operating Mode	The current operating mode is displayed here (see *Operating Modes* page 10)
④	Generation Power	The power being generated at this time in kW *Note: This is displayed only when the Generation Sensor is installed (either connected to CT2 input or a harvi device)*
⑤	Message Icon	When this icon is present there is a message from the myenergi server This only applies if you have the myenergi hub device
⑥	Date & Time	The current date and time
⑦	Status Icons	These icons indicate that the import limiting is active (house), a relay is on (R1 / R2) or the e-Sense input is live (e)
⑧	eddi Icon	This eddi unit. If there are wavy lines above the icon, the unit is thermally limiting (the output power will be temporarily reduced)
⑨	Energy Diverted Today	The accumulated energy that has been sent to heater(s) today Only the surplus energy is included
⑩	Temperature	If the optional Relay & Sensor Board (see page 32)is fitted and temperature probes are installed, the temperature of the active heater is displayed
⑪	Heater Icon	This icon represents the active heater, and next to it is the heater number
⑫	Power Diverting to Heater	When eddi is heating, arrows will show here along with the power in kW

Display Icons Key

House Consumption – Not Importing

House Consumption – Importing

Solar Generation Power

Wind Generation Power

Grid Power – Import / Export

Power Flow Direction – Small Amount

Power Flow Direction – Medium Amount

Power Flow Direction – Large Amount

Waiting For Surplus Power

Maximum Heater Temperature Reached

eddi Device – Normal

eddi Device – Too Warm (output limited)

kW   Instantaneous Power

kWh   Accumulated Energy Today

Heater – Top Immersion

Heater – Bottom Immersion

Heater – Radiator

Heater – Underfloor

Heater – Swimming Pool

Relay – Relay 1

Boiler

Heat Pump

Message Available

Import Power Limiting Active

Relay 1 or 2 – On

Economy Tariff Electricity Available

Active Heater Number

DSR Mode Active

Operating Modes

Waiting for Surplus
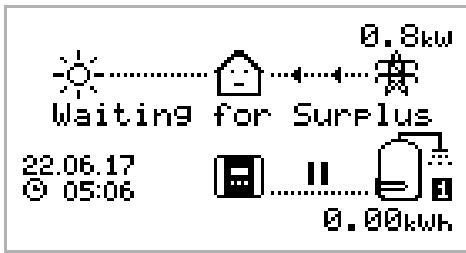
eddi is waiting for surplus power from the microgeneration system.

The house in the centre is straight faced as grid electricity is being used by the house (0.8kW is this example).

We can see that eddi hasn't started heating with surplus power yet today as there is no accumulated energy; the 0.00kWh under the water cylinder symbol.

Heating
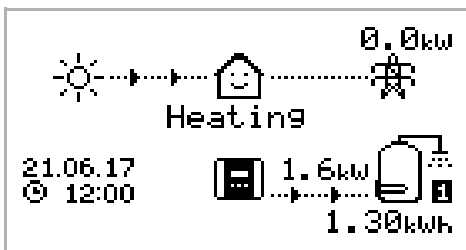
eddi is now diverting power to the heater.

The heater currently being heated is shown by the icon on the right and the small number (1 in this case) corresponds to the heater number.

The amount of power being diverted at any one moment is shown between the eddi icon and the heater icon (in this screenshot the diverted power is 1.6kW).

All of the surplus energy which has been set to the heater today is displayed under the heater icon (1.30kWh) in this example.

Now the house is smiling because there is no grid electricity being used.

Max Temp Reached
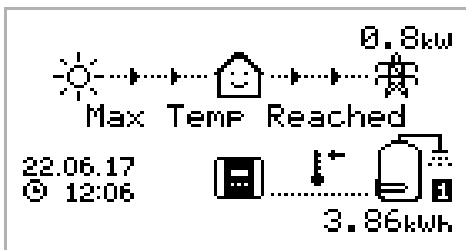
The heater is now at maximum temperature.

Now there are no arrows or power figures for the heater and a thermometer symbol is shown.

As eddi is no longer able to divert the surplus power to the heater and so this is now exported to the grid (0.8kW in this example).

If there is a second heater present (connected to Heater 2), eddi will switch over to start heating Heater 2.

Boosting
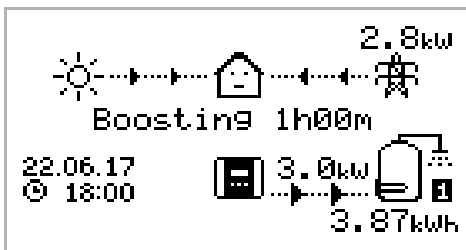
Boosting means eddi is giving maximum power to the heater, irrespective of available surplus power.

The arrows going to the heater are large and the power figure (3.0kW in the example screen) is the heaters' maximum power level.

During a boost , it is likely that there will be power imported from the grid (2.8kW here).

The timer starts at (1h00m) and will count down until the boost ends. The boost duration may be altered with the ⬆ or ⬇ buttons.

Manual Boost

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 with a duration of 1 hour, this can be adjusted during the boost. The boost can be cancelled at any time.

Activating Manual Boost

1. From the main screen, press ✓

0.8kW
Waiting for Surplus
22.06.17
⏱ 12:06
3.01kWh
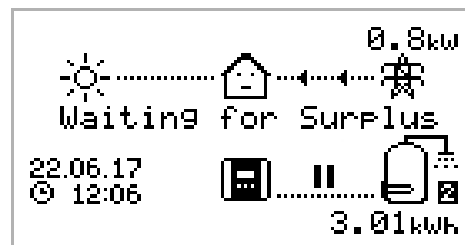
2. If there is more than one heater you may select which heater you wish to boost by pressing ⬆ or ⬇ to change heater. Press to ✓ start boost

Manual Boost
Select Heater:
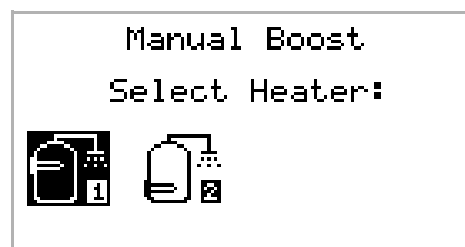
3. The boost duration may be altered by pressing ⬆ or ⬇ during the boost

2.0kW
Boosting 1h00m
22.06.17
⏱ 12:06
3.0kW
1.86kWh
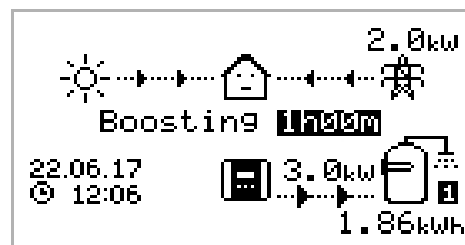
Cancelling Manual Boost

The boost can be cancelled by pressing ✓ twice

2.0kW
Cancel Boost
22.06.17
⏱ 12:46
3.0kW
4.08kWh
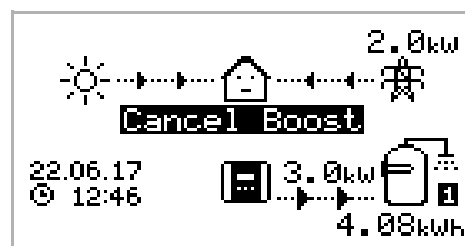
Boost Timer

eddi 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.

- There are four editable time slots for each heater.

- Setting the duration to 0h00 will make the boost inactive.

Programming Boost Times

```
     BOOST TIMER
       Heater 1
Start  Dur   Days
07:30  1h30  MTWTF--
08:00  0h15  MTWTF--
12:00  0h00  -----SS
17:00  0h00  -----SS
```

1. From the main screen, press ⊗ to enter Main Menu

2. Select Boost Timer by pressing ⬇ until the option is highlighted, then press ✓

3. Select the heater you wish to program the boost times for (e.g. Heater 1) and press ✓

4. The BOOST TIMER screen is then shown.

5. The boost can now be edited: Use ⬆ or ⬇ buttons to highlight the time slot you wish to change. The screen above shows the start hour being edited:

6. Alter the start hour with the ⬆ or ⬇ buttons and then press ✓ to move to minutes.

7. Edit the duration in the same way and then press ✓ again to edit the days of the week you want the boost to be active for; each day of the week and toggled on/off with ⬆ or ⬇ buttons, press ✓ to go to the next day. Pressing ✓ on the last day (Sunday) will confirm the boost time slot and whole line will be highlighted again.

8. Press ⊗ to exit the BOOST TIMER screen.

Economy Tariff Boosting

Boosting only when economy rate electricity is available can be achieved in one of three ways:

1. Setting the boost timer to coincide with the economy tariff times. This option should be used only if the electricity meter is a dual-rate meter (modern meters usually are multi-rate).

2. Boost only at set times AND if economy rate electric is available*

3. Automatically boost whenever the economy tariff rate electricity is available, regardless of the boost times*

```
     BOOST TIMER
       Heater 1
Start  Dur   Days
e 07:30 1h30 MTWTF--
- 08:00 0h15 MTWTF--
- 12:00 0h00 -----SS
- 17:00 0h00 -----SS
```

* Options 2 and 3 are available only when using the eSense input on the Relay & Sensor Board. The Relay & Sensors menu will be available when a Relay & Sensor Board is fitted inside the unit.

For option 2, the eSense Input in the Relay & Sensors menu option should be set to the appropriate Boost Enable setting. With the Boost Enable function set, the BOOST TIMER screen will include an extra column (see screenshot). The e can be toggled on/off, if e is present, the boost will activate only when the boost times are valid and the economy rate tariff is available.

Alternatively the eSense input can be used to activate the boost whenever the economy tariff rate electricity is available, regardless of boost times (option 3). To do this, the eSense Input in the Relays & Sensors menu should be set to Boost 1, Boost 2 or Boost 1&2. When using this option, the Boost Timer is not needed.

Boost Time Conflicts

Both heaters cannot be active at the same time and so if the boost times are conflicting, the higher priority heater will take precedence. (See *Priority* on page 19). If one or more boost times conflict for one heater, the boost will follow the latest time or longest duration.

Cancelling Boost

The boost can be cancelled by pressing ✓ twice during a boost.

Menus

Main Menu

Main Menu Options			Description
Savings…	Today:		Energy savings in kWhs over the relevant period. Only surplus diverted energy is included. ALL = Total kWhs of surplus energy diverted to the heaters since installation.
	Yesterday:		
	This Week:		
	This Month:		
	This Year:		
	ALL:		
Readings…	READINGS 1/4	Status:	Current status of the unit.
		Exporting: Importing:	Power being imported or exported, from or to the grid respectively.
		Output [1]:	Power level in Watts currently being supplied to the heater output and the active heater number.
		Output (PWM):	Pulse Width Modulation % - this equates to the output voltage; 100% = output voltage is same as supply voltage.
		Output Current:	AC current going to the heater.
		Heatsink Temp:	Temperature of the integral heat sink.
	READINGS 2/4	Voltage:	Supply voltage to the unit.
		Voltage Max:	Maximum supply voltage since switch-on.
		Voltage Min:	Minimum supply voltage since switch-on.
		Frequency:	Grid frequency.
		Exporting: Importing:	Power being imported or exported, from or to the grid respectively.
		Grid Current:	AC current at grid connection point, including reactive currents.
	READINGS 3/4	Exporting: Importing:	Power being imported or exported, from or to the grid respectively.
		Generation:	Power from the generator (if available).
		Consumption:	Power consumed by the house (if available).
		Diverting:	Total diverted power (inc. all devices).
		Output [1]:	Current power to the respective heater.
	READINGS 4/4	Exporting: Importing:	Power being imported or exported, from or to the grid respectively.
		Battery:	If a an AC Battery is being monitored, the battery power reading is shown: Discharging (+) Charging (-).
		0:Britain GMT/BST	The set Time Zone.
		LOC:	Local time.
		UTC:	Coordinated Universal Time.
Information…	INFORMATION 1/4	Status:	Status of the unit.
		Serial No:	Serial number of the unit.
		Firmware:	Firmware version installed in the unit.
		Cal Date:	Factory calibration date.
		Power Fail:	Time and date of last supply failure.
	INFORMATION 2/4	Grid Sensor:	Grid current sensor source.
		Last Fault:	Last recorded fault code.
		Fault Date:	Date and time of last recorded fault code.

Main Menu Options				Description
	INFORMATION 3/4	Network ID:		Network information for this device when linked to other devices using RF network.
		Device Address:		
		Master Address:		
		Channel:		
		EUI:		
		MNID:		
	INFORMATION 4/4	Time:		Current time.
		Date:		Current date.
		Uptime:		Length of time passed since last switch-on.

		DDL: II:
		LGA: MGA:
		DSR:
				Network load control limiting information:
				    DDL = Dynamic Device Limit (Amps)
				    II = Input current (Amps)
				    LGA = Load Group Limit Active (Y/N)
				    MGA = Monitor Group Active (Y/N)
				    DSR = Demand Side Response active (Watts and
				    time to live)
				See *Load Balancing / Current Limiting* (p30).

	EDDI-CTs			Shows the CT configuration for each device (listed by serial number) in the whole installation:
				    NO = CT number on the device
				    TY = CT type (see *CT Config* p21)
				    GP = Group number
				    GL = Group limit (Amps)

	ZAPPI-CTs			
	HARVI-CTs			
Linked Devices Info…	DEVICES PWR NOW			Power currently being drawn by the linked devices.
	DEVICES PWR ALLOT			Available power allotted to the linked devices.
	DEVICES PWR MAX			Maximum power that can be used by each device.
	DEVICES PWR MIN			Minimum power that can used by each device. See *Linking Devices* (p23) for more details about linked devices.
Boost Timer…	Heater 1…			Programmable boost times for heaters. See *Boost Timer* (p12) for details on how to set the timers.
	Heater 2…			
	Relay 1…			Programmable boost times for relays These options are available only if the optional Relay & Sensor Board is installed.
	Relay 2…			
Settings…	Time & Date…	Update from Cloud:		If set to **On** the Time and Date will be automatically updated from the **myenergi** server (requires **hub**).
		Time:		Set current time in 24 hour format.
		Date:		Set date in Format (see below).
		Format:		Sets the date format.
		Auto DST:		Automatic Daylight Saving Time adjustment.
		Zone:		Set zone for Daylight Saving Time.
	Display…	Language…		Set language for the main screen and menus.
		Icons…	Heater 1:	Heater icon be be selected from several heater types.
			Heater 2:	
			Generation:	Generation icon can be sun or wind.
		Backlight…		Set the duration the display backlight remains on after a button press.
		Contrast…		Set the display contrast.
	Priority…	Heater 1		Sets which heater will be heated as a priority, the other heater will be heated only when the priority heater has reached maximum temperature.
		Heater 2		
		Check Period:		When heating the lower priority heater, this is how

Main Menu Options			Description
			often the priority heater is checked to see if it can store any more heat.
	Advanced…		Advanced menu and settings (passcode protected) Default passcode: 0 0 0 0

Advanced Menu

Advanced Menu Options			Description
Supply Grid…	Phase:		Set the supply phase to use for this device – see *Advanced Settings* page 20 for more information.
	Device Limit:		Sets the maximum allowable current to be drawn by the **eddi**. See *Load Balancing / Current Limiting* (page 30).
	Grid Limit:		Maximum grid import power limit. Output to heater is reduced to keep import below this level. This also applies when boosting – see *Advanced Settings* (page 20) for more information.
	Battery:		Sets the mode for managing power when a battery system is present in the installation. See *Battery Storage Systems* (page 31) for more information.
	Net Phases:		When set to **ON** will net the imports and exports across phases allowing surplus power from one phase to be used on a different phase. – see *Advanced Settings* (page 20) for more information.
	Export Margin:		Minimum level of export power which is maintained when eddi is diverting surplus power – see *Advanced Settings* (page 20) for more information.
	Exp Threshold:		Level of export which must be seen before the eddi will start diverting power to the heater – see *Advanced Settings* page 20 for more information.
	Response Delay:		Time before the **eddi** starts diverting after **Exp Threshold** is exceeded – see *Advanced Settings* (page 20) for more information.
Linked Devices…	Devices…		Other **myenergi** devices can be wirelessly linked to **eddi**, this shows connected devices and their priorities. Settings for some devices are made here - See *Linking Devices* (page 23).
	Pairing Mode…		Puts this **eddi** in pairing mode so it can be linked to another device - See *Linking Devices* (page 23).
	Channel…	RF Channel:	Sets the radio frequency channel number used when linking other devices - See *Linking Devices* (page 23).
	Set Master		Sets the **eddi** device to be master (✓ is shown) or slave. See *Linking Devices* (page 23) for details.
	Reset Settings…		Clear all linked device settings. See *Linking Devices* (page 23).
CT Config…	CTINT:		Internal CT, used to configure a group limit. See *Load Balancing / Current Limiting* (page 30) for details.
	CT1:		Sets the function of CT1 input. See *CT Config* (page 21) for more details.
	CT2:		Sets the function of CT2 input. See *CT Config* (page 21) for more details.
Passcode…			The code required to access the Advanced menu can be set with this function.
System…	Restore Settings…	Restore Yesterday	Restore the configuration from the previous day.
		Clear Data	Clear all savings data from memory.
		Factory Reset	Restore configuration to factory defaults (savings data

Menus

Advanced Menu Options		Description
		are unaffected unless **Clear Data** is also selected).
	`Confirm`	Confirm restore options and re-boot device.
`Download Firmware`		Downloads latest firmware from **hub**. See **myenergi hub** device instructions.
`Bootloader`		Enter Bootloader mode.

Relay & Sensor Menu

Relay & Sensor Board Menu (if installed)				Description
Relays & Sensors…	Temperatures…	Set Limit:		The target temperature for when using a PT1000 temperature probe connected to PT1/PT2 PT1 corresponds to Heater 1, PT2 is for Heater 2.
		Hysteresis:		Sets the temperature drop required from Set Limit, before heating resumes.
		Readings:		Current temperature readings of the probes.
	Relay 1…	Disabled		Disable Relay 1 control (relay is always off).
		Export…	On Threshold:	When export power exceeds this threshold, the relay will operate.
			Off Threshold:	When the export power is under this threshold the relay is switched off.
			Inc Diverted:	Surplus power currently being diverted to the heater will be included as export for the thresholds above.
			Min On Time:	When the On Threshold is exceeded and the Relay switches on, it will remain on for at least this time after the export drops below the Off Threshold.
			Min Off Time:	When the export power exceeds the On Threshold the relay will operate only if it has been off for this amount of time.
		Import…	On Threshold:	When import power exceeds this threshold, Relay 1 on the Relay & Sensor Board will operate.
			Off Threshold:	When the import power is under this threshold the relay is switched off.
			Min On Time:	When the On Threshold is exceeded and the Relay switches on, it will remain on for at least this time after the import drops below the Off Threshold.
			Min Off Time:	When the import power exceeds the On Threshold the relay will operate only if it has been off for this amount of time.
		Heating…	Heating 1	Operates Relay 1 when Heater 1 output is live.
			Heating 2	Operates Relay 1 when Heater 2 output is live.
			Heating 1&2:	Operates the relay when either Heater 1 or Heater 2 output is live.
			Destrat 1	De-stratification pump control for Heater 1; the Relay operates when eddi is trying to heat Heater 1 and the heater is at maximum temperature. After Check Period the relay will deactivate.
			Destrat 2	De-stratification pump control for Heater 2; the Relay operates when eddi is trying to heat Heater 2 and the heater is at maximum temperature. After Check Period the relay will deactivate.
		Boost Timer		Relay 1 will operate as a programmable timed relay. There will be an extra Boost Timer option in the Boost Timer menu.
		Fault Signal		Will de-activate the relay if a fault occurs.
	Relay 2…	Disabled		Disable Relay 2 control (relay is always off).
		Export…	On Threshold:	When export power exceeds this threshold, the relay will operate.
			Off Threshold:	When the export power is under this threshold the relay is switched off.
			Inc Diverted:	Surplus power currently being diverted to the heater will be included as export for the thresholds above.

Menus

Relay & Sensor Board Menu (if installed)			Description
		Min On Time:	When the On Threshold is exceeded and the Relay switches on, it will remain on for at least this time after the export drops below the Off Threshold.
		Min Off Time:	When the export power exceeds the On Threshold the relay will operate only if it has been off for this amount of time.
	Import…	On Threshold:	When import power exceeds this threshold, Relay 2 will operate.
		Off Threshold:	When the import power is under this threshold the relay is switched off.
		Min On Time:	When the On Threshold is exceeded and the Relay switches on, it will remain on for at least this time after the import drops below the Off Threshold.
		Min Off Time:	When the import power exceeds the On Threshold the relay will operate only if it has been off for this amount of time.
	Heating…	Heating 1	Activates the Relay 2 when Heater 1 output is live.
		Heating 2	Activates Relay 2 when Heater 2 output is live.
		Heating 1&2	Operates Relay 2 when either Heater 1 or Heater 2 output is live.
		Destrat 1	De-stratification pump control for Heater 1; the Relay operates when **eddi** is trying to heat Heater 1 and the heater is at maximum temperature. After 5 mins the relay will deactivate.
		Destrat 2	De-stratification pump control for Heater 2; the Relay operates when **eddi** is trying to heat Heater 2 and the heater is at maximum temperature. After 5 mins the relay will deactivate.
	Boost Timer		Relay 2 will operate as a programmable timed relay. There will be an extra Boost Timer option in the Boost Timer menu.
	Follow Relay 1		Relay 2 will always be the same state as Relay 1.
eSense Input…	Disabled		The **eSense** Input is disabled and have no function.
	Boost…	Boost 1	If a voltage is present on the **eSense** input, the selected heater will be boosted. The boost will end when there is no longer a voltage present.
		Boost 2	
		Boost 1&2	If a voltage is present on the **eSense** input, the highest priority heater will be boosted. If the eSense Input still has a voltage present after the heater reaches maximum temperature, the other heater will be boosted. The boost will end when there is no longer a voltage present on **eSense** input.
	Heater Enable…	Heater 1	The **eSense** input will act as an thermostat for the selected heater (or both heaters). The heater will only be able to be heated when **eSense** has a voltage present.
		Heater 2	
		Heater 1&2	
	Boost Enable…	Boost Enable 1	The **eSense** input will act as an enable for the **Boost Timer** for the selected heater (or both heaters). The **Boost Timer** has an additional parameter 'e', when this option is set. See *Boost Timer* page 12.
		Boost Enable 2	
		Boost Enable 1&2	

operation and installation manual

Configuration

Settings

All settings are described in the *Main Menu* section, however, the more commonly altered settings are described in more detail below.

Time & Date

The date and time are used for the Boost Timer and the savings calculations and therefore should be set correctly.

In the event of a power-cut, **eddi** will still keep track of the time and date for a few days, so when power is restored the clock will not need to be reset.

Time is always in 24-hour format but the date format can be changed.

eddi will automatically adjust the clock for Daylight Savings Time (DST) as long as `Auto DST` is enabled and the correct time zone is selected.

Priority

The priority for heater outputs can be set to `Heater 1` or `Heater 2`. The priority heater will be heated first with the surplus power and only when fully heated will **eddi** start to divert power to the lower priority heater.

eddi will switch back to the priority heater if it has cooled and the thermostat for the heater is closed.

When heating the lower priority heater, the `Check Period` sets how often the priority heater is checked to see if it can store any more heat.

If the Relay & Sensor Board is installed and temperature probes are used, **eddi** will immediately switch back to the priority heater if the temperature drops by more than the set `Hysteresis`. The `Hysteresis` can be set in the `Temperatures` menu of the `Relays & Sensors` menu option.

Icons

The heater icons shown on the main screen can be individually set for both heater outputs. This gives an installation specific, graphical representation which heater is active. For example; Heater 1 could be a hot water cylinder and Heater 2 could be a radiator. This function can be accessed via the `Settings/Display/Icons` menu.

As well as being able to customise the heater icons, it's also possible to change the generation type from solar to wind.

Configuration

Advanced Settings

The `Advanced Settings` menu is passcode protected.

The default passcode is `0000` although it can be changed with the `Passcode` menu option.

Supply Grid - Phase

The `Phase` setting is only used when installing the **eddi** in a 3-phase property.

It should be set to match the phase number that the **eddi** is wired to so that the power measurements are correct and that the **eddi** responds to the correct phase when using the **harvi** wireless sensor.

See *Three-Phase Systems* (page 31) and *Supply Grid – Net Phases* (page 20) for more information.

Supply Grid – Device Limit

Sets the maximum current that the **eddi** will draw (including when boosting). This is useful if the supply current is limited, like a 13A fused spur rather than a 16A MCB.

Supply Grid – Grid Limit

Sets the limit that can be drawn from the grid connection (i.e. the maximum import current or the main fuse rating). `Grid Limit` is a global limit; all the **myenergi** networked devices will be included when limiting.

Example: A property has a grid supply limit of 65A, several appliances are on and the property is consuming 12kW (52A) by other appliances and the user wants to boost the water heating. If the water heater is rated at 3kW (13A), the total consumption would exceed the allowed import current. However, with a `Grid Limit` setting of 60A, **eddi** would limit the power to the heater to 1.8kW (8A) and therefore the maximum allowed import current would not be exceeded.

Supply Grid – Battery

If the property has a static AC battery system installed, it's possible to get the **eddi** to work in harmony with the system, provided a CT has been installed to monitor the battery inverter.

See *Battery Storage Systems* (page 31) for more information about battery storage systems.

Setting	Function description
None	There is no battery system installed.
Limit to Gen	Will limit the output of the **eddi** (except when boosting), to prevent unwanted draining an AC coupled battery system. This setting does not require a CT to monitor the battery, but does need a CT to monitor the solar/wind generation. **Note:** This setting is to support legacy installations – it is preferable to install a CT to monitor the battery and use one of the settings below.
Avoid Drain	Stops the **eddi** (or other linked **myenergi** devices) draining the battery when using surplus power from the solar or wind generator.
Avoid Charge	Effectively allows the **eddi** (or other linked **myenergi** devices) to take priority over the battery when charging from solar or wind generation.
Avoid Both	Provides both of the above functions.

Supply Grid – Net Phases

When enabled, all readings from 3-phase **myenergi** devices and **harvi** units configured as 3-phase, will be netted. This means that surplus generation on ANY phase will be considered to be available for consumption on ANY other phase.

See *Three-Phase Systems* (page 31) for more details about **myenergi** devices on 3-phase supplies.

Supply Grid – Exp Threshold

This is the amount of export that must be exceeded before **eddi** starts diverting power to the heater loads. Once diverting starts all the surplus power, less the `Export Margin` (see below) will be diverted to the heater load.

Supply Grid – Response Delay

This setting gives a delay before `eddi` starts to divert power (after the `Export Threshold` is exceeded).

The default setting is `0s` (zero seconds), however, if there is an AC-side battery storage system installed at the property, this may need to be increased. For example, the storage system will be trying to charge the batteries with the surplus power, but because `eddi` is very fast, the surplus power would have already been taken-up by `eddi`. This may be undesirable as it would usually make more economic sense to store the energy in the batteries as priority. By introducing a small `Response Delay` (say 5 seconds), the battery system is given chance to respond before `eddi` does.

Supply Grid – Export Margin

This sets a minimum level of export power which is maintained when `eddi` is diverting surplus power to the heaters. Normally `Export Margin` would be set to `0W` (zero Watts) and all of the available surplus will be diverted to the heaters, however, it is sometimes desired to have a minimum export level at all times.

CT Config

The CT1 and CT2 inputs are configured depending on the connected CT sensors. The internal CT which measures the output current also has some settings.

Note: These settings are the same when using CTs with the `harvi` device, however, they are set via the `Linked Devices` menu rather than the `CT Config` menu.

Important: There must by **only one Grid CT** set (per phase) for the whole installation.

CT	Description
CTIL	This is the internal CT which measures the output current of the `eddi`.
CT1	CT1 input.
CT2	CT2 input.

CT Type	Description
None	No CT connected.
Grid	Grid CT monitors the import and export power of the property, this is main control CT and there must only be one Grid CT set for each phase.
Generation Only	Monitors Solar PV or Wind generation.
Storage Only	Monitors a device that can 'store' energy (e.g. a third-party energy diverter) and enables the `eddi` to take priority over it. The power used by the third-party device is considered as surplus power unless the device is intentionally using grid power (i.e. it is boosting). The CT should be installed on the Live supply cable feeding the diverter, with the arrow pointing away from it.
Gen & Battery	Monitors Solar PV or Wind generation that is combined with a DC-coupled battery.
Monitor	Monitors any load, for example a washing machine or the lighting circuit. This setting can also be used to limit current drawn by `myenergi` devices on a particular circuit which includes other loads. See *Load Balancing / Current Limiting* (page 30) for more details.
AC Battery	Used to monitor an AC-coupled battery. With this setting it's possible to manage the distribution of surplus energy between the battery and the `eddi` (including `myenergi` devices). The `Battery` setting in the `Supply Grid` menu is used to configure how the eddi will operate alongside the battery system. See *Battery Storage Systems* (page 31) for more information. The CT should be installed on the Live supply cable of the battery inverter/charger, with the arrow pointing away from it.

CT Groups

Configuration

CTs can be put in groups so that their readings are netted. For example, you might want to monitor two solar PV systems and see the total generation on the display. Use **Group** in the **CT Config** menu to set which group the CT should be in.

Note: Different CT Types cannot be in the same group, the group names make this clear.
Only the first 4 groups can be used for current limiting, see Group Limits below.

Group Limits

Current limits can be set for certain CT Groups. When a Group Limit is set the **myenergi** devices in the group will limit the power they draw to keep within the set limit.

Group limits should be set only on the *master* device. See *Linking Devices* (p23) for details about *master* devices.

It is possible to use more than one group limit type (e.g. IL1 with MN1, so that there are two conditions for limiting).

Group Limit example	Additional CT installed	CT config (all devices)

Limit current drawn by two **eddi** devices that are on the same 20A supply.	None; the internal CTs are used.	`CTIL`
		`Type: Internal`
		`Group: IL1`
		`Group Limit: 20A`

Limit current drawn by an **eddi** device that is fed from a 25A supply which is also feeding another appliance (e.g. a tumble dryer).	One CT is clipped around Live of the 25A supply and wired to **CT2** of the **eddi**.	`CT2`
		`Type: Monitor`
		`Group: MN1`
		`Group Limit: 25A`

Limit current drawn by two **zappi** devices that are in a garage which is fed from a 40A supply. A washing machine and dryer are also in the garage.	One CT is clipped around Live of the 40A supply to the garage and wired to **CT2** of one of the **zappi** units.
	Note: The other **zappi** does not need to have a CT connected, but it will still need to have a CT input configured to be in the same Monitor group.
		`CT2`
		`Type: Monitor`
		`Group: MN1`
		`Group Limit: 40A`

Linking Devices

Up to six **myenergi** devices can be wirelessly linked together. By linking devices, you can use more of your own energy or have more control and visibility. Devices available now (or soon to be available) are:

zappi – An eco-smart electric vehicle charge point that can use surplus power to charge the car.

harvi – A self-powered wireless sensor that can be used along with **myenergi** load controlling devices such as **eddi** and **zappi**. It is able to detect grid import/export conditions as well as generation power and send this information wirelessly to devices such as the eddi or zappi, this can greatly simplify installation.

hub – The link between your **myenegi** devices and the internet, allowing remote monitoring and control via a mobile App.

Master & Slave Devices

When two or more **myenergi** devices are wirelessly linked, one device will act as the '*master*' device. This device will control the other '*slave*' devices. Some settings can only be changed on the master device, e.g. `Grid Limit` and `Net Phases`.

Use the `Set Master` function in the `Advanced Settings/Linked Devices` menu to set which device should be master. It's a good idea to choose the device that is the most convenient to access should you wish to change settings.

Pairing Devices

Devices are 'paired' by selecting `Pairing Mode` on each device (one device must be set to *master*).

1. On the *slave* unit, select `Pairing Mode` from the `Advanced Settings/Linked Devices` menu or by pressing the **pair** button if the device is a **harvi** or **hub**.

2. Now select `Pairing Mode` on the *master* device.

3. You will now see the `SEARCHING FOR SLAVES` screen and **eddi** will be searching for other devices which are on the same channel and are in Pairing Mode. Any devices found are listed along with their unique serial numbers.

4. Select the device you want to add by highlighting the appropriate device using the ⬆ and ⬇ buttons and then pressing ✅ The device will then be added and the screen will return to the previous menu.

5. The `DEVICES` screen will then show, listing all the devices in the network. The recently added device will be able to be configured after the `(UPDATING)` message disappears.

Channels

On rare occasions it is possible that there are other appliances operating on the same frequency which could cause interference. If it is not possible to link devices or the connection seems poor, changing the RF Channel may help. To do this make sure all devices are removed from the network by selecting `Reset Settings` in the `Linked Devices` menu and then select a different channel with the `Channel` menu option. Be sure to change the channel on the other devices before attempting to link them.

Removing Devices

A device can be removed by selecting it from the `Devices` menu and then selecting `Remove Device`.

Device Settings

Most device types have settings which can only be changed via the `Linked Devices` menu. For example, **eddi** and **zappi** have a setting for priority and **harvi** has settings to configure its CT inputs (see *Device Priorities* page 24).

The device settings are accessed through the `Linked Devices` menu; select `Devices` then select the appropriate device and press ✅ to bring up the devices' settings screen. Refer to the relevant devices' instruction document for more information regarding the actual device settings.

Note: After a device has been paired you will have to wait a few seconds for the device to update before the settings can be accessed, the screen will show `DEVICES(UPDATING)` when this is happening.

Configuration

Device Priorities

The priority of each, load controlling linked device, can be set from any device with a display. This enables control of how the surplus energy is shared between them. The example below shows one *eddi* device, two *zappi* devices and one *harvi* on the same 'network'.

```
            DEVICES
1 eddi…       12345670 ~
2 ZAPPI…      87654321
2 zappi…      76543210
  harvi…      24680246 ?
```
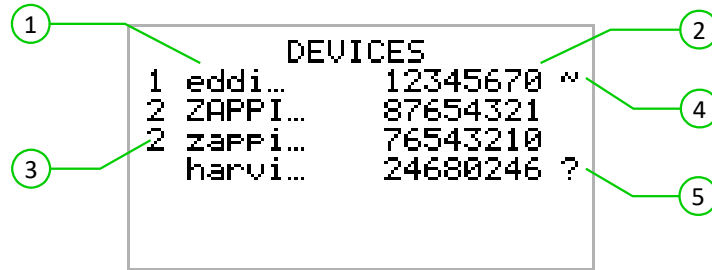
All linked devices ① are listed in the **DEVICES** screen, the device shown in CAPITAL letters is the device currently being viewed. The serial number of each device is shown on the right ②

The priority is shown on the left of each load controlling device ③ with 1 being the highest priority. If two or more devices have equal priority, the available surplus (for that priority level) is shared equally between them.

The **~** symbol ④ indicates which device has the Grid CT connected to it connected to it.

If the **?** symbol ⑤ is shown along side a device, it indicates that communication has been lost from the device.

Linked Devices Information

The current status of all linked devices, can be viewed together in the **LINKED DEVICES INFO** screen which can be found from the **Main Menu**.

```
  LINKED DEVICES INFO
1 eddi         3070W~≛
2 ZAPPI        4321W ╤
2 zappi        1320W ≛
3 eddi          170W ✗
  hub               ?
```
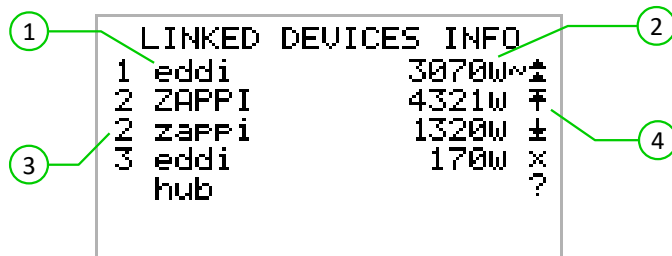
This screen lists all the linked devices ① and the priority setting for each device ③ The current device is shown in CAPITAL letters. To the right of each device is the real-time output power level ② The right side of the screen has symbols to show the status of each device ④ Refer to the table below for the meaning each symbol.

N	Grid CT – the device has a Grid CT configured (there should be only one)
M	Master – the device is the controlling device in the network
≛	Boost – the device is currently boosting
╤	Max – the device is at maximum output power
≛	Min – the device is at minimum controllable output power
✗	No Load – the device is not able to use surplus power as there is no load
?	Communication problem – there is no response from the device

operation and installation manual

Installation

Mounting

- **eddi** is NOT suitable for installation outdoors.

- Ensure the device always has adequate ventilation; do not block the vents or obstruct the airflow at the back of the unit.

- **eddi** must be fixed to a vertical surface

The **eddi** needs to be securely mounted to a wall using the dedicated mounting bracket which comes attached to the unit.

1. With the unit on its back on a flat surface, remove the front cover by unscrewing the two screws **1** and lifting it off.
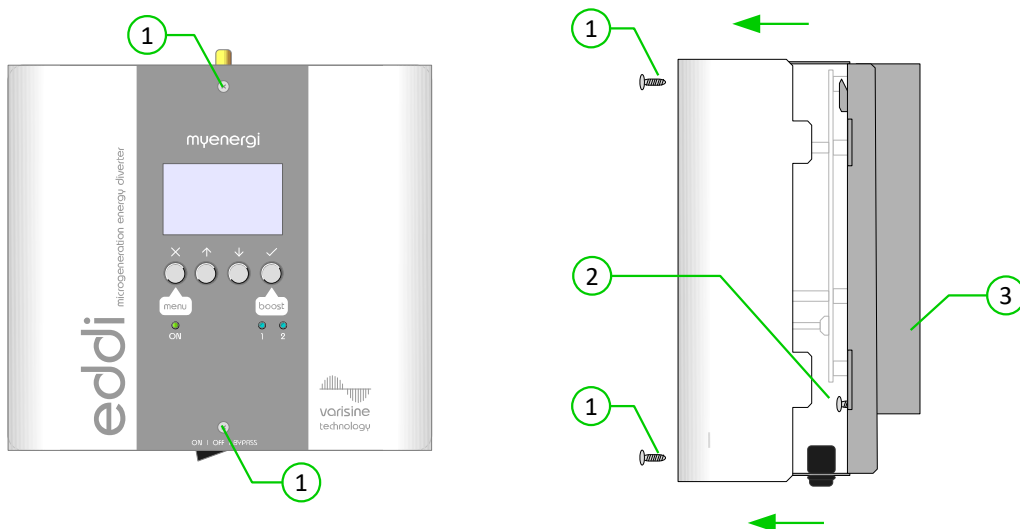
2. Loosen the two mounting bracket securing screws **2** and separate the bracket **3** from the **eddi**.

3. Offer the bracket up to the wall and mark the holes for drilling. If fixing to a timber stud wall, you can use the two central vertically aligned fixing points to screw the bracket directly into the timber.

Clearances

Installation
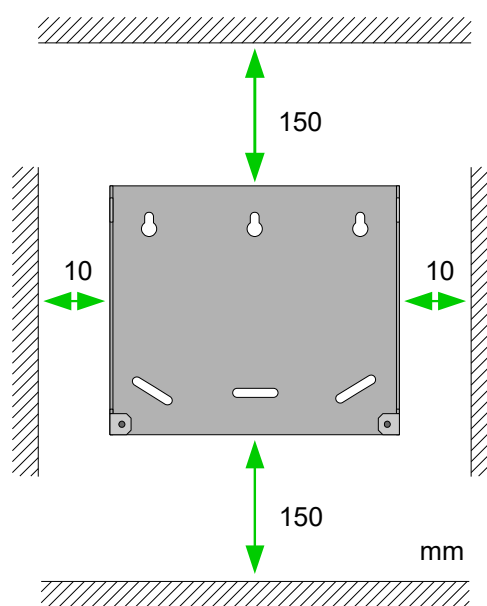
Wiring

Warnings

(!) WARNING! An electric shock can be fatal; electrical connection work may only be carried out by a competent person

(!) The earth conductor must be correctly installed and reliably connected

(!) This device must be equipped with an over-current protection device of maximum 16 Amps (B16)

(!) Only purely resistive loads must be connected to the Heater output terminals

Strip Length

8mm
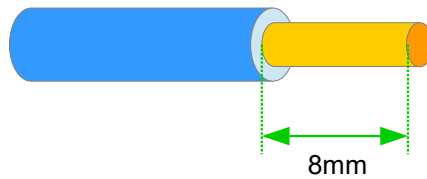
Overview Diagram

The diagram on the following page gives an overview of the basic wiring with respect to the grid supply and the microgeneration system.

Also refer to the *Application Examples* (page 35) for full wiring schematics.

Supply

The **eddi** device should be connected to a single-phase 230V or 240V nominal AC supply. The supply should be from a dedicated 16A circuit breaker, or it can be from a hard-wired 13A fused spur outlet if the heater load is less than 3kW.

Heater Loads

Most purely resistive heaters can be used with eddi, examples include immersion heaters, storage heaters, convection heaters and underfloor heating mats. Refer to the Application and Examples section for wiring diagrams using different heater types. Whichever heater type is used, the following criteria must always be observed:

- One or two purely resistive loads may be connected (Note: only one is live at any one time)

- Maximum rating of each load is 3.68kW

- Minimum heater rating is 150W

- Resistive loads only

- Heater Neutral conductor must be connected to heater output N terminal

- No electronic controls to be connected to Heater terminals; mechanical thermostats only

- No timers to be connected to Heater terminals, including mechanical timers

Cable Clamps

If using flexible cables or cables not secured by other means, the cable clamps must be used to secure the supply and heater cables.

Wiring Overview Diagram

The diagram on the following page gives an overview of the wiring required for a standard installation with the **eddi** connected to one or two heaters.

Wiring Overview Diagram

HOT WATER CYLINDER
or
OTHER HEATERS

PV ARRAY

☐ Not supplied – available separately

1 or 2 resistive heating loads can be used.
3.7kW max. load for each heater (sequentially heated)

INVERTER

Generation Sensor (optional)
A second sensor can be fitted to monitor generation.
This can be wired to the *eddi* or *harvi*

Sensor(s) do not need to be wired to unit if using *harvi*

HEATERS

CT1 CT2

SUPPLY

00156

FiT
METER

Mains supply from B16 MCB with 2.5mm² cable

CONSUMER
UNIT(s)

harvi (wireless sensor option)
Harvests power from the grid sensor and transmits the import/export information to the *eddi* - Electrical wiring or batteries are not required

harvi

00156

ELECTRICITY
METER

Grid Sensor (required)
Wired to CT1 terminals of the *eddi* or it can be wired *to harvi* if it's difficult to run the cable back to the *eddi*

SUPPLY
GRID

myenergi

eddi

CT Sensor Installation

Current Transformers (CTs) are used to measure current at various places of the installation. For example, the Grid connection point, the solar/wind inverter or a static battery system.

Installation of a CT to monitor the Grid connection point is required. Other CTs are optional and can be purchased separately. The number and location of CTs used within an installation will vary according to devices installed and the user requirements.

CTs can be wired to any myenergi device with CT inputs (e.g. eddi, zappi or harvi). This enables very flexible installation as the CT can be wired to the nearest device. **Note**: The harvi device can be used if it is not practical to connect any CT to the eddi or zappi.

Once installed the CTs need to be configured, see *CT Config* (p21) for details of how to configure the CTs.

Grid CT

The Grid CT sensor (supplied) needs to be clipped around either the Live or Neutral meter tail of the electricity supply meter. If using the Neutral conductor, reverse the direction of the sensor (so the arrow is reversed).

The positioning of the Grid CT sensor is crucial, take note of the following when deciding where best to install the sensor:

✔ Can be connected to any myenergi device with a CT input e.g. the eddi or zappi (wired sensor) or harvi (wireless sensor).

✔ **ALL** of the import and exported power must be 'seen' by the sensor – be sure to install it upstream of ANY junction box or 'Henley Block' (the CT can be fitted inside the consumer unit).

✔ There must be only one Grid CT per-phase for the whole installation. (There can be other CTs but only one at the grid connection point, also note CTs for third-party devices do not matter).

✔ The CT should be on the Live or Neutral cable.

✔ The arrow on the bottom of the CT sensor must be pointing towards the consumer unit (in the direction of grid import) if on the Live cable, or reversed if on the Neutral cable.

✔ Ensure the CT is fully closed and clicks shut.

✔ Be sure to wire the CT the correct way round; black [−], red [+] otherwise import and export readings will be swapped.
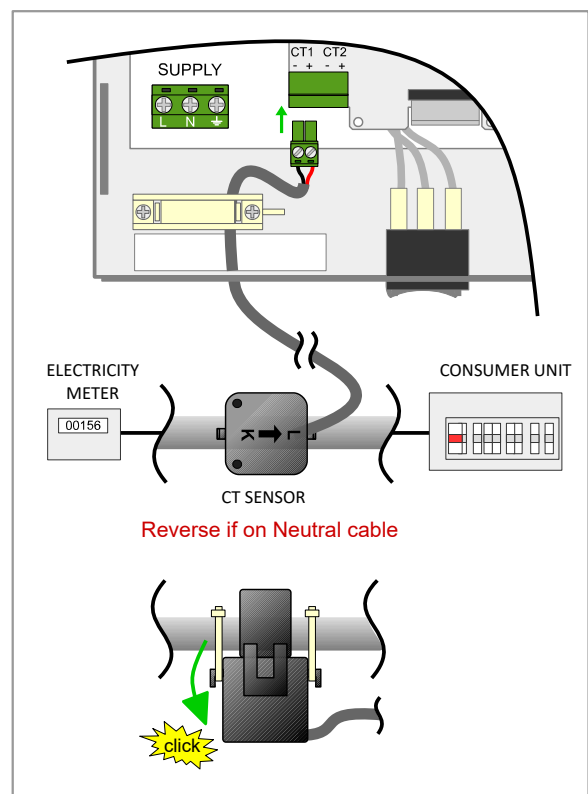
Additional CTs

There is an option to add other CT sensors (available separately) for monitoring the generation or other appliances such as battery systems or general loads. Installing a CT for the generator (PV system) will allow the main screen to show the generated power and the total power consumption of the all the other appliances in the property.

CTs can also be used to limit the power drawn form the supply. See *Load Balancing / Current Limiting* p30.

✔ Additional CTs Can be connected to any myenergi device with a CT input that is linked to the network (see *Linking Devices* p23).

✔ The arrow on the bottom of the sensor must be pointing in the direction of normal power flow (e.g. away from the PV inverter) if on the Live cable or reversed if on the Neutral cable.

✔ Ensure the sensor is fully closed and clicks shut.

✔ Be sure to wire the CT the correct way round; black [−], red [+].

Extending the CT sensor cable

If there is a need to extend the CT sensor cable, twisted-pair cable like CAT5 or telephone cable must be used (only use one pair). DO NOT use mains cable, bell wire or speaker cable. It is important to use only twisted-pair cable to maintain signal integrity. The cable can be extended up to 100m.

Wireless CT Sensor (optional accessory)

In some cases it can be difficult or impractical to install a wired sensor. For example it may be the case that the **eddi** unit needs to be connected to a sub-board, rather than main consumer unit and two consumer units are in different buildings.

The solution is to install **harvi** – a clever little device that enables the **zappi** and **eddi** products to be installed without using wired CT sensors for measuring the grid and/or generation power; instead the CT sensor is connected to **harvi**.

The **harvi** does not need batteries or a power supply – the energy from the sensor is harvested and used to transmit the measurement signal to the **zappi** or **eddi**. This means batteries or electrical wiring are eliminated!

Up to 3 CT sensors may be used with **harvi** and it also supports 3-phase systems if three sensors are connected.

Refer to the **harvi** installation guide for details on installing and configuring **harvi** for your system.

CT Golden Rules

Grid CT

- Only <u>ONE</u> Grid CT per phase (check for only one **~** symbol in `Linked Devices Info`).
- Located to 'see' ALL import and ALL export current (i.e. always upstream of any junction box).
- Arrow pointing in direction of import (e.g. towards consumer unit if on Live cable).
- Must be on the same phase as the Master **myenergi** device.

All other CTs

- Arrow should point towards the consumer unit.

3-Phase **harvi** CTs

- When using **harvi** in 3-phase mode, the CT inputs correspond to the phase number (e.g. CT1 = Phase 1).

CT can dos

- ✔ Can be wired to ANY **myenergi** device in the network.
- ✔ **harvi** can be used to make ANY CT wireless.
- ✔ Cable can be extended up to 100m (must use twisted-pair cable e.g. one pair of CAT5).
- ✔ Cable can be shortened.
- ✔ Can be clipped around two or more conductors feeding appliances of the same type (e.g. two Live cables from two inverters that are on the same phase).
- ✔ Can be in close proximity to other CTs.
- ✔ Wires can be swapped around in device to reverse the direction of the readings (e.g. change import to export).
- ✔ Can be grouped with other CTs of the same type so that the power reading is summed (e.g. east and west solar Generation).
- ✔ Can be used on the Neutral conductor (direction of arrow or wires must be reversed).
- ✔ Can be set to **None** if you want to exclude the reading.

Installation

Advanced Installation Options

Load Balancing / Current Limiting

CTs can be also used to the limit current drawn by **myenergi** devices to avoid overloading circuits. this is sometimes referred to as load balancing. There are four different ways to limit current and they can be used alone or combined for more complex situations. See the table below:

Function	Operation	Example
`Device Limit`	Sets a maximum current that can be drawn by the device (e.g. **eddi**). The current will not be exceeded even during boost.	An **eddi** is wired to a 3.4kW heater, but the supply to the **eddi** is only a 13A fused spur.
`Grid Limit`	Sets the limit that can be drawn from the grid connection (i.e. the maximum import current). The **eddi** and any other linked **myenergi** device, will limit the current they draw if there is a danger of exceeding the set `Grid Limit`.	An **eddi** is installed in a property with a 65A main fuse. The property has a 10kW electric shower and a washing machine (2.5kW). With the `Grid Limit` set to say 55A, the **eddi** would reduce its load if the shower and washing machine were on at the same time.
`Group Limit` (internal CT)	Sets the combined current limit for several **myenergi** devices.	A property has a large PV array and a swimming pool, three **eddi** units are installed to heat the pool with surplus solar power using 3kW heaters. The supply for the eddi units is only 40A, to be safe a `Group Limit` of 35A is set.
`Group Limit` (with external CT)	Sets the combined current limit for several **myenergi** devices that are sharing a supply with another large appliance.	An **eddi** is installed to heat the hot water cylinder in a garage which also has a washer and a dryer (2.5kW each), the garage has a supply of only 32A coming from the main consumer unit in the house. If all appliances were on and there was no limiting set, the total current would exceed the maximum supply current.

Three-Phase Systems

If the installation supply is three-phase, it is recommend to install a **harvi** device and use three Grid CTs (one for each phase). This will allow the **eddi** to show the total grid import and export figures rather than just one of the phases.

If all three phases are monitored and the generation is 3-phase, it is also possible to net the export power across phases, to do this, enable `Net Phases` in the `Supply Grid` menu see *Supply Grid – Net Phases* (p20). This allows the **eddi** to use surplus power from any phase and not just the phase which the **eddi** is installed on. However, you must be sure that the electricity is metered in such a way as to allow this.

Three **eddi** units can be installed (one per phase) provided there are suitable loads. **Tip:** It is usually possible to split a 3-phase heating element into 3 individual elements by removing the links.

Battery Storage Systems

AC coupled

Where there is an AC coupled battery storage system, there can be a conflict as both the storage system and the **eddi** are effectively competing to consume the surplus energy. Whilst this is not necessarily an issue, the results can be somewhat unpredictable.

There is the option to add an additional CT sensor to monitor the battery storage; this will give control as to which device has priority. This additional CT sensor should be wired to one of the CT terminals of the **eddi** or a **harvi** device if wireless measurement is required. This CT should be clipped around the live or neutral cable of battery inverter.

During the setup process it will be necessary to change the setting for the appropriate CT to `AC Battery`; refer to *CT Config* (page 21) . Also refer to *Supply Grid – Battery* (page 20). for information on setting 'priority' of battery systems.

DC coupled

Battery systems that charge directly from the solar array and cannot change from AC are usually referred to as being DC coupled. This type of battery system uses the solar PV inverter to provide power from the batteries, thus it is not possible to differentiate between solar and battery power when using a CT to measure the AC current from the inverter.
Because of this limitation, there are less options for managing the surplus power with this type of battery system. However it is usually possible to effectively give priority to battery by setting an `Export Margin` in the **eddi**. A setting of 50W or 100W is recommend. The `Export Margin` setting is found in the `Advanced Settings/Supply Grid` menu.

Third-Party Diverters

Some properties may have a third-party energy diverter already installed and you may want the eddi to take priority (when consuming surplus power) over the other diverter. This is possible by installing an extra CT to monitor the diverter.

The CT should be clipped around the Live cable of the supply feeding the diverter. The arrow on the CT should be pointing away from the diverter. Wire the CT to the nearest **myenergi** device or use a **harvi** unit if wireless connection is needed.

Configure the `CT Type` as `Storage Only`. See *CT Config* (page 21) for details of how to configure CTs.

Voltage Optimisers

If there is a voltage optimiser (VO) installed in the property, the CT sensor and the **eddi** must both be on the same side of the VO; either the incoming grid supply or the optimised supply.

Installation

Relay & Sensor Board

eddi has the option to install a Relay & Sensor Board (available separately), this allows for many different wiring configurations and includes the following features:

- Two independent multifunction relays (16 Amp)

- eSense input (isolated 230V detection for economy tariff etc.)

- Two temperature sensor inputs (PT1000)

The two relays can be independently set for several different functions, or they can be set to operate as a pair. The relay functions include:

- Export Threshold

- Import Threshold

- Operate when heating

- De-stratification pump control

- Timed operation

- Fault signal for BMS systems

Refer to *Application Examples* (page 35) in this guide and Relay & Sensor Menu (page 17*)* for practical examples and
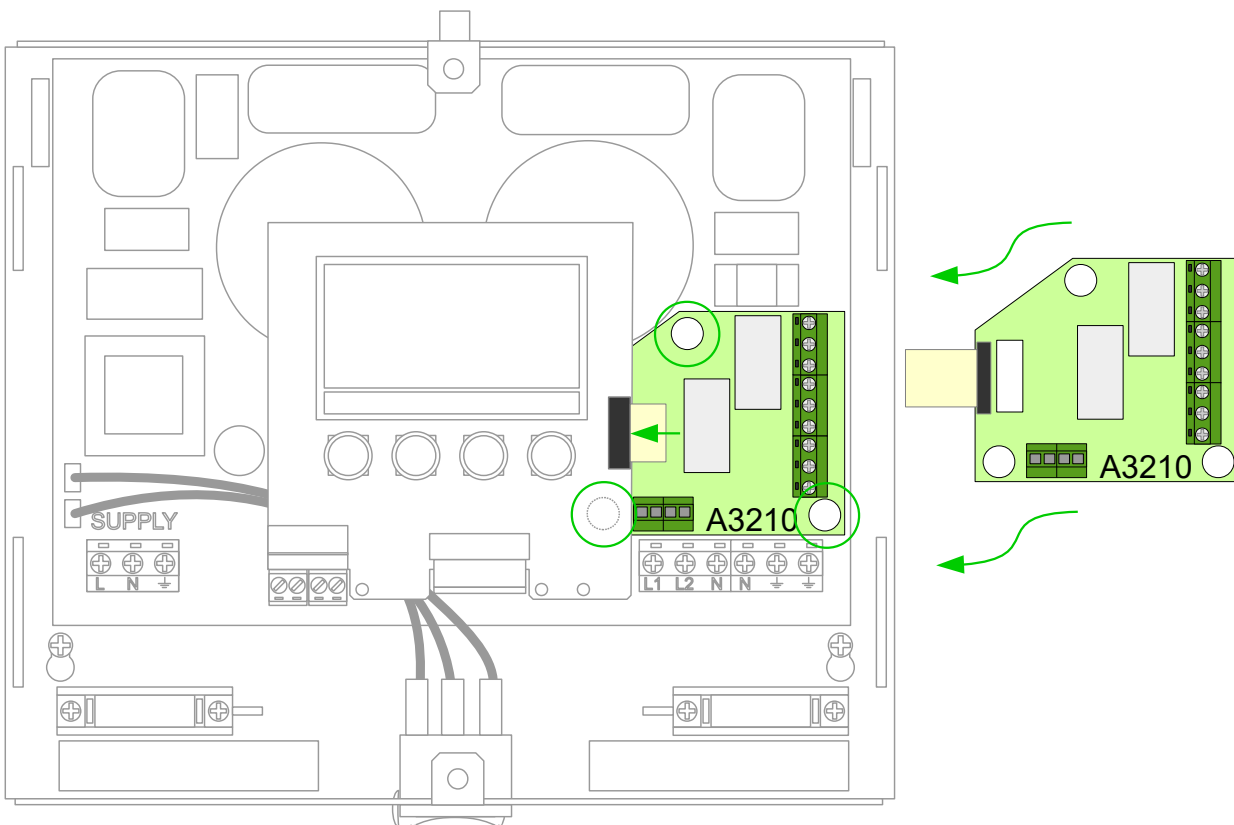
The Relay & Sensor Board is installed by plugging it into the **eddi** main circuit board using the three plastic spacers included with the Relay & Sensor Board.

The flexible ribbon cable is then pushed into the black connector to the right-side of the display on the top **eddi** circuit board.

Fitting the Cover

Refit the cover and secure with the two M3x12 screws (2). Ensure the locating tabs (1) are correctly positioned inside the slots on the chassis before the cover is screwed on.

Installation
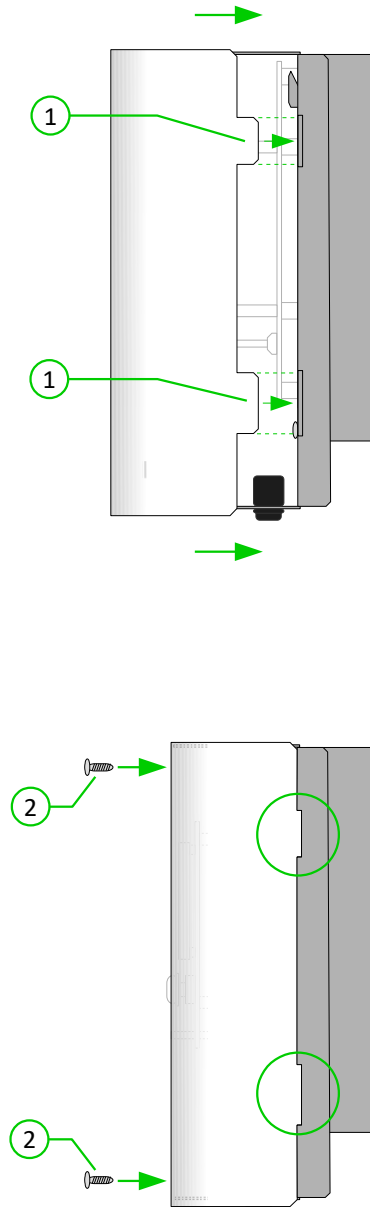
Setup

Switching On

After completing and checking the wiring of the supply, the heater(s) and the sensor(s), switch on the **eddi** via the circuit breaker or fused spur.

If it's not already on – switch the **Bypass Switch** (underneath the **eddi**) to the **ON** position.

After the **eddi** starts-up for the first time, the time and date will need to be set. Refer to the *Configuration* section on page 19 for further guidance.

By default, the **eddi** is set to operate as in *Application Examples 1: Single Element Water Heater* (page 36) If the application differs, refer to the specific application example for details of settings that may need to be changed.

If **eddi** has been installed alongside other **eddi** units or another **myenergi** device, refer to *Linking Devices* (page 23) for guidance on pairing devices. Also refer to the instruction documentation for the other devices.

Testing

Before leaving site, it is wise to perform a few checks to ensure that the sensors and heaters have been correctly installed and are functional.

1. Test the heaters by trying a manual boost (see page 11), and check the power reading on the screen for the heater corresponds to the heater rating.

2. Cancel the boost by pressing the ✅ button twice during the boost.

3. When **eddi** is diverting surplus power to the heater, the grid power figure (above the pylon symbol) should be `0.0kW`). *Note; however, if the surplus power exceeds the rating of the heater then this cannot be achieved and some export power will be observed.*

    If power is being imported from the grid when the **eddi** is in `Heating` mode, it is likely that the Grid CT is incorrectly installed - see *Grid CT* on page 28.

4. If a Generation CT has been installed, the generated power will show at the top left of the main screen.

    If the generation reading is missing, the most likely cause is the Generation CT has not been configured – see CT Config on page 21. Or, if the Grid CT is instead wired to a **harvi** ensure the device settings are correct – see *Device Settings* on page 23.

Application Examples

The following wiring diagrams show some suggested applications and are examples only; there are many more possibilities.

Please refer to the *Safety* section (page 4) and be sure to read all of the installation sections before attempting to install the eddi.

A good level of electrical competence and a reasonable understanding of domestic plumbing systems is assumed for studying these application examples.

Contact technical support if in any doubt: **support@myenergi.uk**

Application Examples

1: Single Element Water Heater
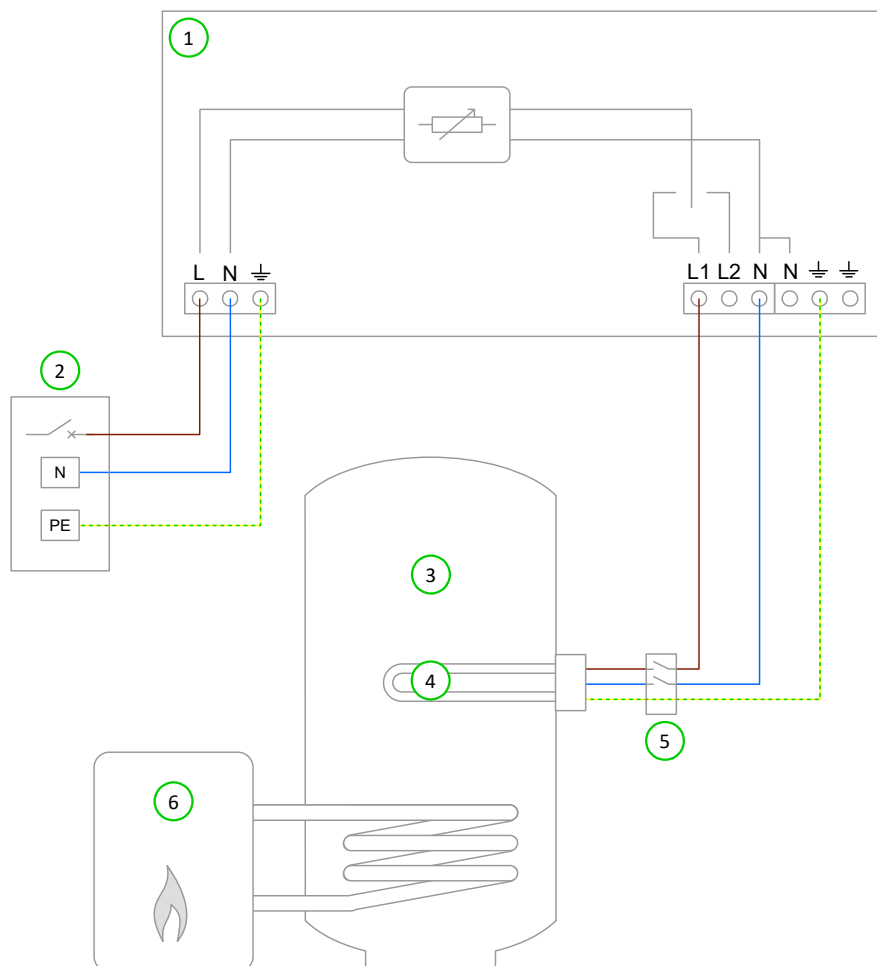
Key for Wiring Diagram 1

① eddi device

② Mains supply (230V AC from B16 circuit breaker or 13A fused spur)

③ Hot water cylinder

④ Heating element 1 (max. 3.7kW)

⑤ Isolator (20A double pole)

⑥ Auxiliary water heating boiler

Functional Description

This is the most simple installation and the most common.

A single heater is wired to the Heater 1 output.

The water in the cylinder (3) is heated with only surplus power until the thermostat has opened, the eddi will display Max Temp Reached and the surplus power will then be exported until the water cools, heating will then resume.

An auxiliary heat source (e.g. a gas boiler) is set to heat the water either early in the morning or later in the evening, depending on the home owners' lifestyle. Heating the water during times of generation (e.g. daylight hours) is best avoided to allow maximum capacity for the surplus energy.

This is the default configuration for eddi; the settings do not need to be altered for this application.

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Water Top / Water Bottom
				Heater 2:	None
		Priority…			Heater 1

Application Examples

2: Dual Element Water Heater
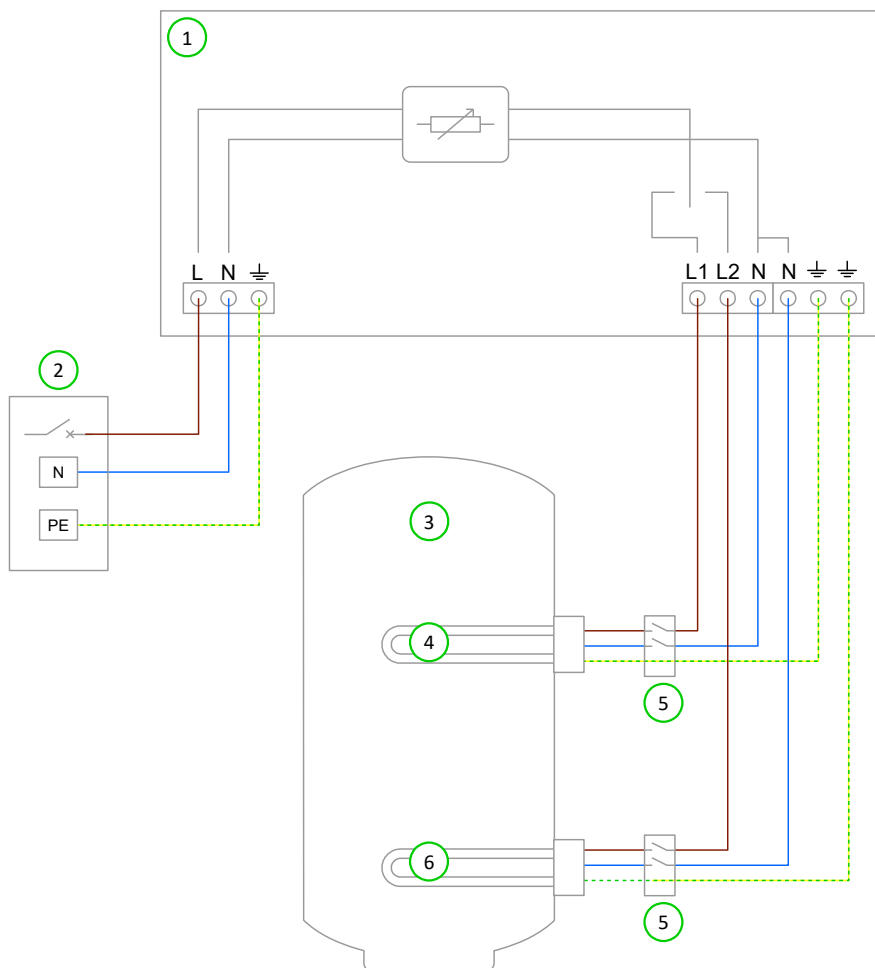
Key for Wiring Diagram 2

(1) eddi device

(2) Mains supply (230V AC from B16 circuit breaker or 13A fused spur)

(3) Hot water cylinder

(4) Heating element 1 (max. 3.7kW)

(5) Isolator (20A double pole)

(6) Heating element 2 (max. 3.7kW)

Functional Description

Electric only households tend to have a hot water cylinder with two immersion heaters, this is perfect for **eddi** as it can support heating two heaters sequentially.

Heater 1 (the top immersion heater) (4) is heated with surplus power until the water at the top of the cylinder is hot and the thermostat opens, then **eddi** will immediately switch over to Heater 2 (6); heating the bottom of the cylinder. This makes the most of surplus energy as sometimes there will not be enough to heat the whole volume of the cylinder; it's best to heat a smaller proportion (i.e. the top) first so there is some usable hot water, rather than a larger volume of warm water.

During heating of the lower priority heater (Heater 2), **eddi** will switch back to the higher priority heater (Heater 1) every 15 mins to check if it can store any more heat.

When the water is fully heated, any surplus power will be exported, **eddi** will switch back to the priority heater and check the lower priority heater every 15 mins.

The heating priority can be changed in the `Main Menu` (`Priority`).

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Water Top
				Heater 2:	Water Bottom
		Priority…			Heater 1

Application Examples

3: Economy Tariff with Dual Rate Meter
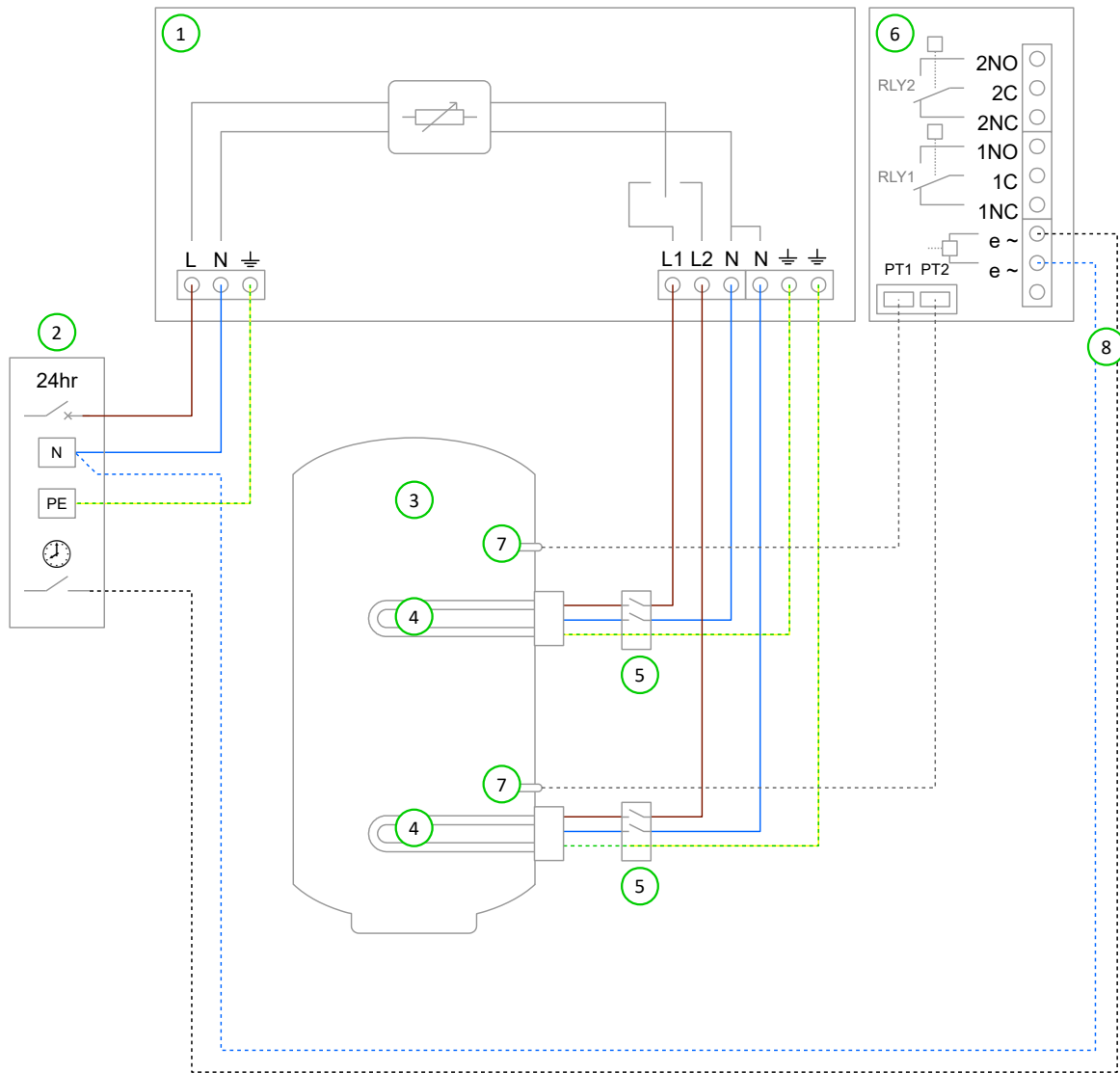
Key for Wiring Diagram 3

(1) eddi device

(2) Mains supply (230V AC from B16 circuit breaker or 13A fused spur)

(3) Hot water cylinder

(4) Heating element (max. 3.7kW)

(5) Isolator (20A double pole)

(6) Relay & Sensor Board (optional add-on for eddi)

(7) Temperature probe (type PT1000) (optional)

(8) Economy rate electric sense wiring (live only when economy rate is available)

Functional Description

It is common for electric only households to employ dual tariff billing. This application enables automatic heating of water when the economy tariff is available whilst also using any surplus generated power to heat the water.

The economy rate electricity can be time based or random, in either case, eddi can be set to heat the water at the economy rate whenever possible, or at the economy rate only during certain times.

Heater 1 (the top immersion heater) (4) is heated with surplus power until the water at the top of the cylinder is hot and the thermostat opens, then eddi will immediately switch over to Heater 2 (6); heating the bottom of the cylinder. This makes the most of surplus energy as sometimes there will not be enough to heat the whole volume of the cylinder; it's best to heat a smaller proportion (i.e. the top) first so there is some usable hot water, rather than a larger volume of warm water.

During heating of Heater 2, eddi will switch back to Heater 1 every 15 minutes to check if it can store any more heat.

When the water is fully heated, any surplus power will be exported, eddi will switch back to the priority heater and check the lower priority heater every 15 minutes.

If eSense Input is set to Boost Enable 1&2, the BOOST TIMER screen for either heater will include an option to enable the boost timer only when the eSense input is live. In the BOOST TIMER, the e can be toggled on/off, if e is present, the boost will activate only when the boost times are valid and the economy rate tariff is available.

Alternatively the eSense input can be used to activate the boost whenever the economy tariff rate electricity is available, regardless of boost times. To do this, eSense Input should be set to Boost 1&2. When using this option, the Boost Timer is not needed.

If automatic sensing of economy rate times is not needed, the boost timer can be simply set to coincide with the economy tariff times. In this case the Relay & Sensor Board (6) and the eSense wiring (8) are not required.

Installation of the temperature probes (7) is optional; the heaters' mechanical thermostat is used by eddi if temperature readings are not required.

The eddi device should be labelled with a "dual supply" warning.

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Top Immersion
				Heater 2:	Bottom Immersion
		Priority…			Heater 1
Advanced Menu…	Relays & Sensors…	Temperatures…			Set Temperatures as required if using temperature probes
		eSense Input…	Boost…		Boost Enable 1&2/ Boost 1&2

Application Examples

4: Economy Tariff with Separate Meters (Heater 1)
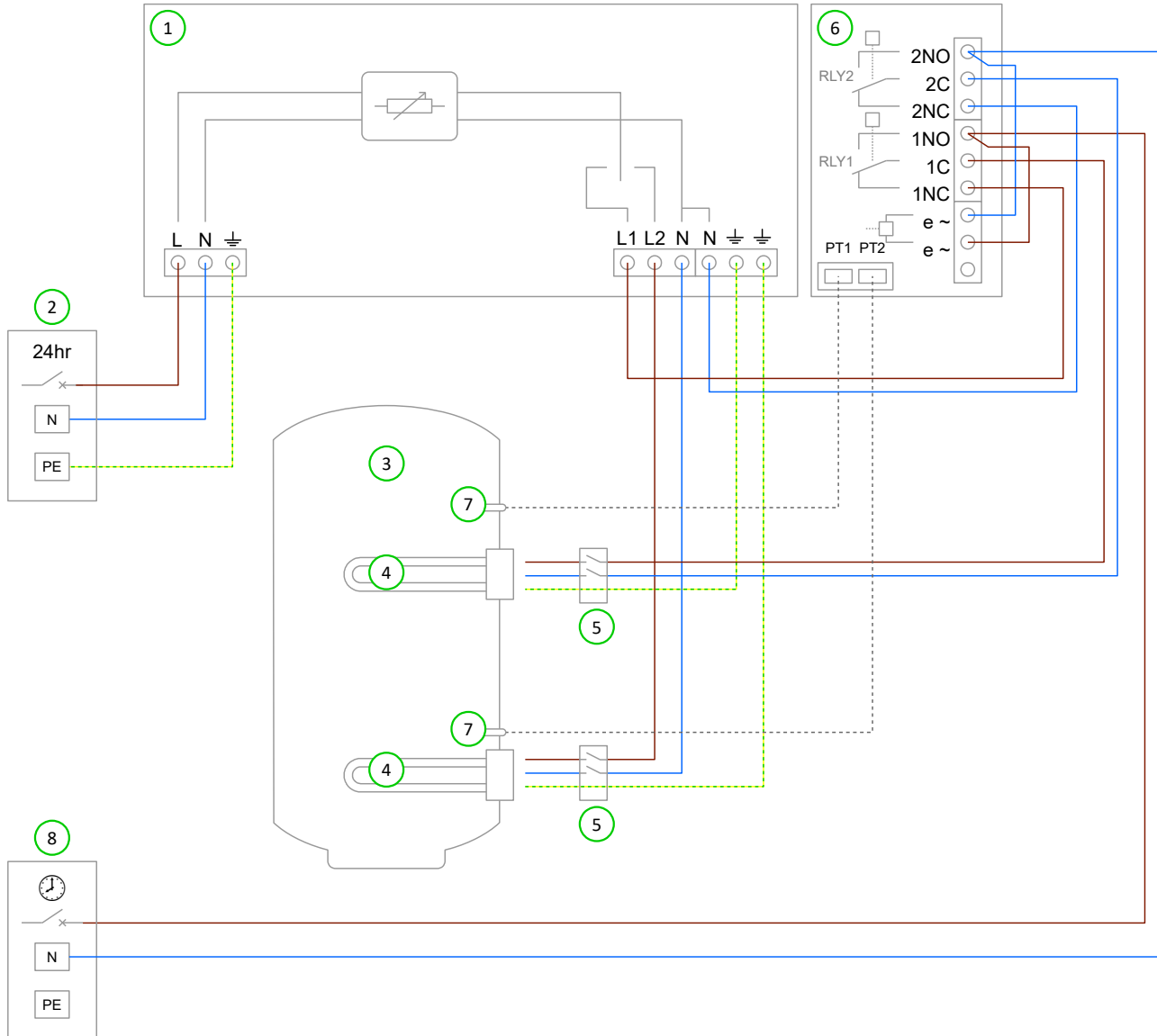
Key for Wiring Diagram 4

① eddi device

② Mains supply (24hr) (230V AC from B16 circuit breaker or 13A fused spur)

③ Hot water cylinder

④ Heating element (max. 3.7kW)

⑤ Isolator (20A double pole)

⑥ Relay & Sensor Board (optional add-on for eddi)

⑦ Temperature probe (type PT1000) (optional)

⑧ Mains supply (off-peak timed) (230V AC from B16 circuit breaker or 13A fused spur)

Functional Description

Some electric only households that employ dual tariff billing use two separate electricity meters; one is live for 24 hours and the other is off-peak timed and bills at the economy rate. Only some appliances are connected to the off-peak supply (usually water heaters and storage heaters).

This application enables automatic boosting of water heating when the economy tariff is available whilst also using any surplus generated power to heat the water. Both the top and bottom immersion heaters can use surplus power and be boosted with peak rate electricity. However, only Heater 1 can be boosted with off-peak electricity (See page 44 if it is desired to have Heater 2 boost using off-peak power).

eddi is powered from the 24-hour supply and the bottom immersion heater is wired directly to Heater 2 output. During the economy tariff times, power needs to be drawn from the off-peak tariff meter, to achieve this the top immersion heater is switched from the eddi Heater 1 output and the off-peak supply using both relays of the Relay & Sensor Board (6).

Heater 1 (the top immersion heater) is heated with surplus power until the water at the top of the cylinder is hot and the thermostat opens, then eddi will immediately switch over to Heater 2; heating the bottom of the cylinder. This makes the most of surplus energy as sometimes there will not be enough to heat the whole volume of the cylinder; it's best to heat a smaller proportion (i.e. the top) first so there is some usable hot water, rather than a larger volume of warm water.

During heating of Heater 2, eddi will switch back to Heater 1 every 15 minutes to check if it can store any more heat.

When the water is fully heated, any surplus power will be exported, eddi will switch back to the priority heater and check the lower priority heater every 15 minutes.

If eSense Input is set to Boost Enable 1, the BOOST TIMER screen for Heater 1 will include an option to enable the boost timer only when the eSense input is live. In the BOOST TIMER, the e can be toggled on/off, if e is present, the boost will activate only when the boost times are valid and the economy rate tariff is available.

Alternatively the eSense input can be used to activate the boost whenever the economy tariff rate electricity is available, regardless of boost times. To do this, eSense Input should be set to Boost 1. When using this option, the Boost Timer is not needed.

Installation of the temperature probes (7) is optional; the heaters' mechanical thermostat is used by eddi if temperature readings are not required.

The eddi device should be labelled with a "dual supply" warning.

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Top Immersion
				Heater 2:	Bottom Immersion
		Priority…			Heater 1
Advanced Menu…	Relays & Sensors…	Temperatures…			Set Temperatures as required if using temperature probes
		eSense Input…	Boost…		Boost Enable 1 / Boost 1

5: Economy Tariff with Separate Meters (Heater 2)
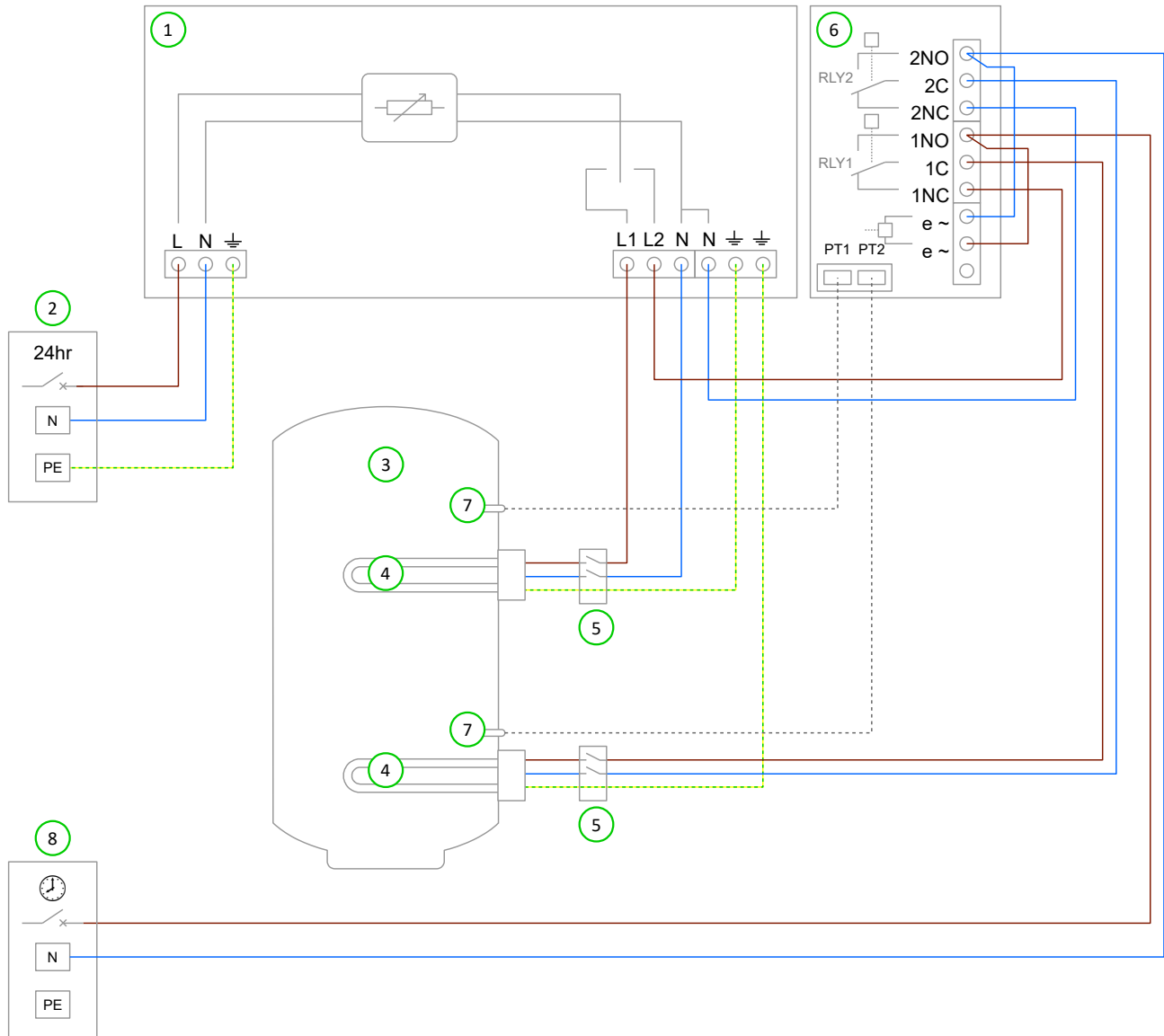
Key for Wiring Diagram 5

① eddi device

② Mains supply (230V AC from B16 circuit breaker or 13A fused spur)

③ Hot water cylinder

④ Heating element (max. 3.7kW)

⑤ Isolator (20A double pole)

⑥ Relay & Sensor Board (optional add-on for eddi)

⑦ Temperature probe (type PT1000) (optional)

⑧ Mains supply (off-peak timed) (230V AC from B16 circuit breaker or 13A fused spur)

Functional Description

Some electric only households that employ dual tariff billing use two separate electricity meters; one is live for 24 hours and the other is off-peak timed and bills at the economy rate. Only some appliances are connected to the off-peak supply (usually water heaters and storage heaters).

This application enables automatic boosting of water heating when the economy tariff is available whilst also using any surplus generated power to heat the water. Both the top and bottom immersion heaters can use surplus power and be boosted with peak rate electricity. However, only Heater 2 can be boosted with off-peak electricity (See page 42 if it is desired to have Heater 1 boost using off-peak power).

eddi is powered from the 24-hour supply and the bottom immersion heater is wired directly to Heater 1 output. During the economy tariff times, power needs to be drawn from the off-peak tariff meter, to achieve this the top immersion heater is switched from the eddi Heater 2 output and the off-peak supply using both relays of the Relay & Sensor Board (6).

Heater 1 (the top immersion heater) is heated with surplus power until the water at the top of the cylinder is hot and the thermostat opens, then eddi will immediately switch over to Heater 2; heating the bottom of the cylinder. This makes the most of surplus energy as sometimes there will not be enough to heat the whole volume of the cylinder; it's best to heat a smaller proportion (i.e. the top) first so there is some usable hot water, rather than a larger volume of warm water.

During heating of Heater 2, eddi will switch back to Heater 1 every 15 minutes to check if it can store any more heat.

When the water is fully heated, any surplus power will be exported, eddi will switch back to the priority heater and check the lower priority heater every 15 minutes.

If eSense Input is set to Boost Enable 2, the BOOST TIMER screen for Heater 2 will include an option to enable the boost timer only when the eSense input is live. In the BOOST TIMER, the e can be toggled on/off, if e is present, the boost will activate only when the boost times are valid and the economy rate tariff is available.

Alternatively the eSense input can be used to activate the boost whenever the economy tariff rate electricity is available, regardless of boost times. To do this, eSense Input should be set to Boost 2. When using this option, the Boost Timer is not needed.

Installation of the temperature probes (7) is optional; the heaters' mechanical thermostat is used by eddi if temperature readings are not required.

The eddi device should be labelled with a "dual supply" warning.

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Top Immersion
				Heater 2:	Bottom Immersion
		Priority…			Heater 1
Advanced Menu…	Relays & Sensors…	Temperatures…			Set Temperatures as required if using temperature probes
		eSense Input…	Boost…		Boost Enable 2 / Boost 2

Application Examples

6: Radiator and Water Heating
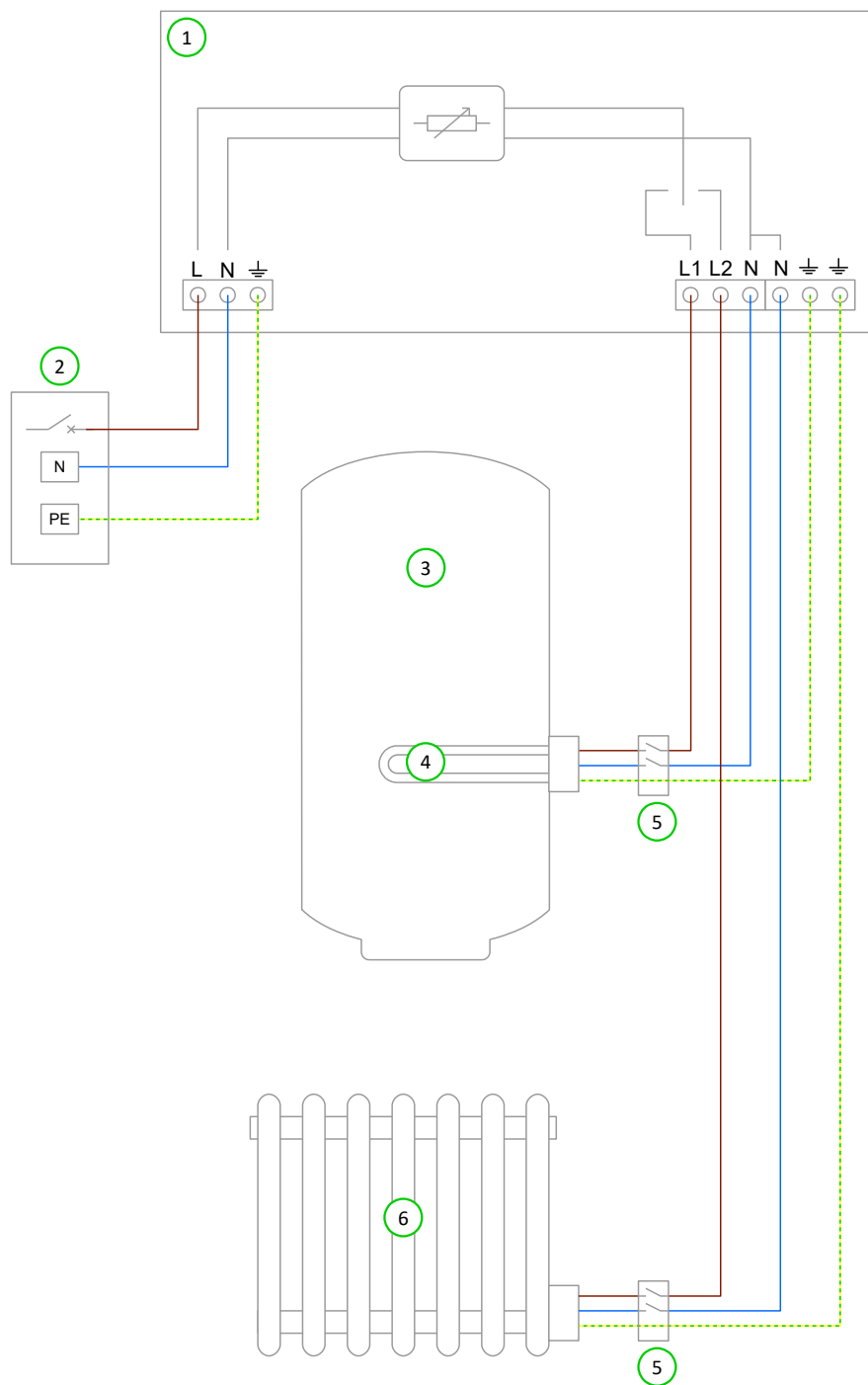
Key for Wiring Diagram 6

① eddi device

② Mains supply (230V AC from B16 circuit breaker or 13A fused spur)

③ Hot water cylinder

④ Heating element (max. 3.7kW)

⑤ Isolator (20A double pole)

⑥ Electric radiator (150W min. 3.7kW max.)

Functional Description

To maximise self-consumption of surplus power, an electric radiator can be heated once the hot water cylinder is up-to temperature, eddi can support heating two heaters sequentially and so is perfect for this application.

Heater 1 (the immersion heater in the hot water cylinder) is heated with surplus power until the water is hot and the thermostat opens, then eddi will immediately switch over to Heater 2 to heat the radiator (6) with surplus power.

During heating of the lower priority heater (Heater 2), eddi will switch back to the higher priority heater (Heater 1) every 15 mins to check if it can store any more heat.

The heating priority can be changed in the `Main Menu` (`Priority`).

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Top Immersion / Bottom Immersion
				Heater 2:	Radiator
		Priority…			Heater 1

7: Underfloor Heating Mat and Water Heating
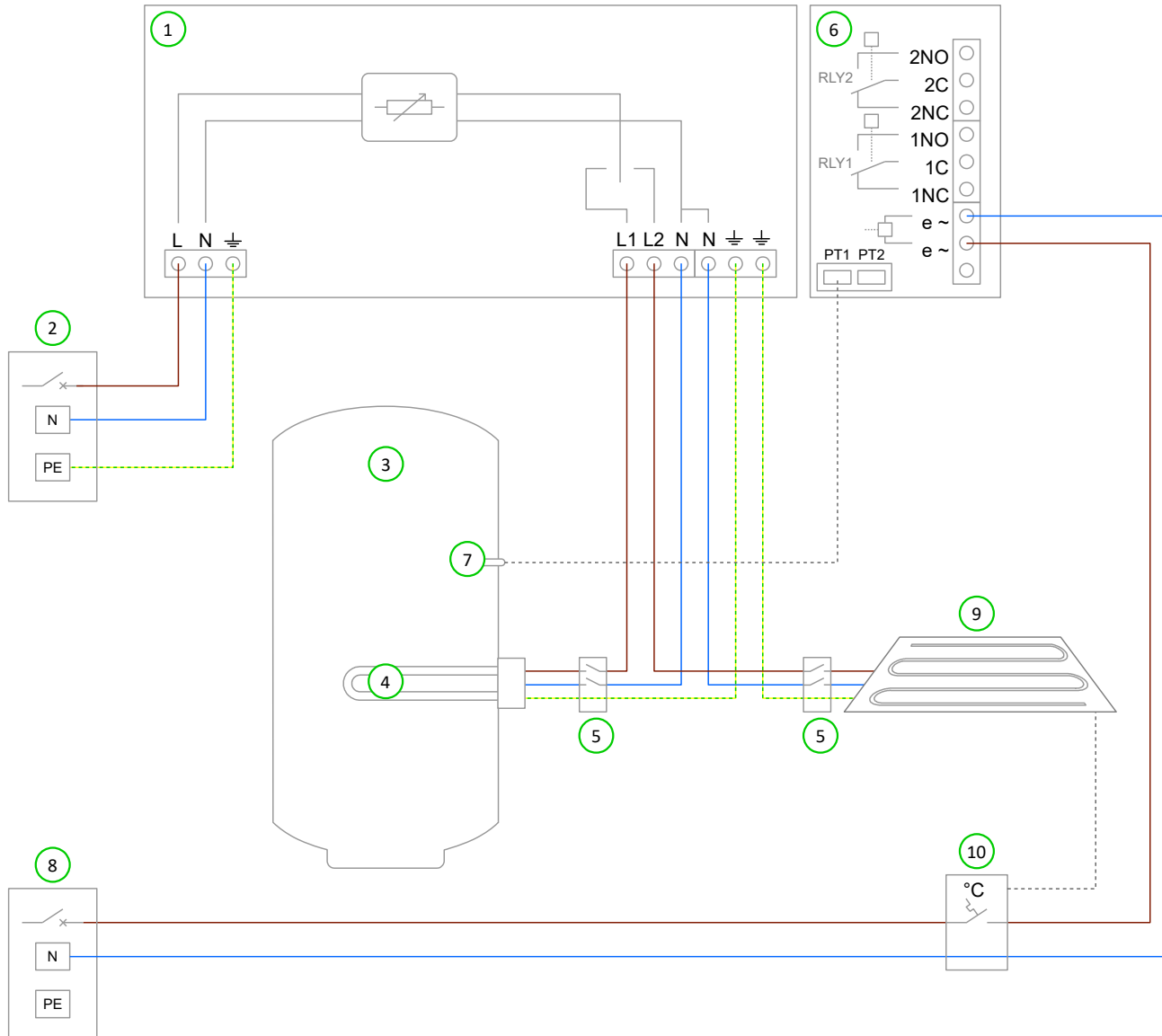
Key for Wiring Diagram 7

① eddi device

② Mains supply (230V AC from B16 circuit breaker or 13A fused spur)

③ Hot water cylinder

④ Water heating element (max. 3.7kW)

⑤ Isolator (20A double pole)

⑥ Relay & Sensor Board (optional add-on for eddi)

⑦ Temperature probe (type PT1000) (optional)

⑧ Mains supply for underfloor heating controller

⑨ Underfloor heating mat (max. 3.7kW)

⑩ Underfloor heating controller or thermostat

Functional Description

As well as water heating, eddi can be used with electric underfloor heating mats. In this application the water is heated as priority and when fully heated, the surplus power is instead diverted to the underfloor heating mat.

Heater 1 (the immersion heater in the hot water cylinder) is heated with surplus power until the water is hot and the thermostat opens, then eddi will immediately switch over to Heater 2 (the underfloor heating mat) (9) and continue diverting the surplus power.

During heating of the lower priority heater (Heater 2), eddi will switch back to the higher priority heater (Heater 1) every 15 mins to check if it can store any more heat.

The heating priority can be changed in the `Main Menu` (`Priority`).

The underfloor heating controller or thermostat (10) is wired to the eSense input of the Relay & Sensor Board (6). The `eSense Input` setting is set to `Heater Enable 2` so only when the thermostat is calling for heat will eddi apply power to the mat. When the underfloor heating thermostat is open eddi will display `Max Temp Reached`.

Installation of the temperature probe (7) is optional; the immersion heaters' mechanical thermostat is used by eddi if water temperature reading is not required.

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Top Immersion / Bottom Immersion
				Heater 2:	Underfloor
		Priority…			Heater 1
Advanced Menu…	Relays & Sensors…	Temperatures…			Set Temperatures as required if using temperature probes
		eSense Input…	Heater Enable…		Heater 2

8: Water Heater with De-stratification Pump
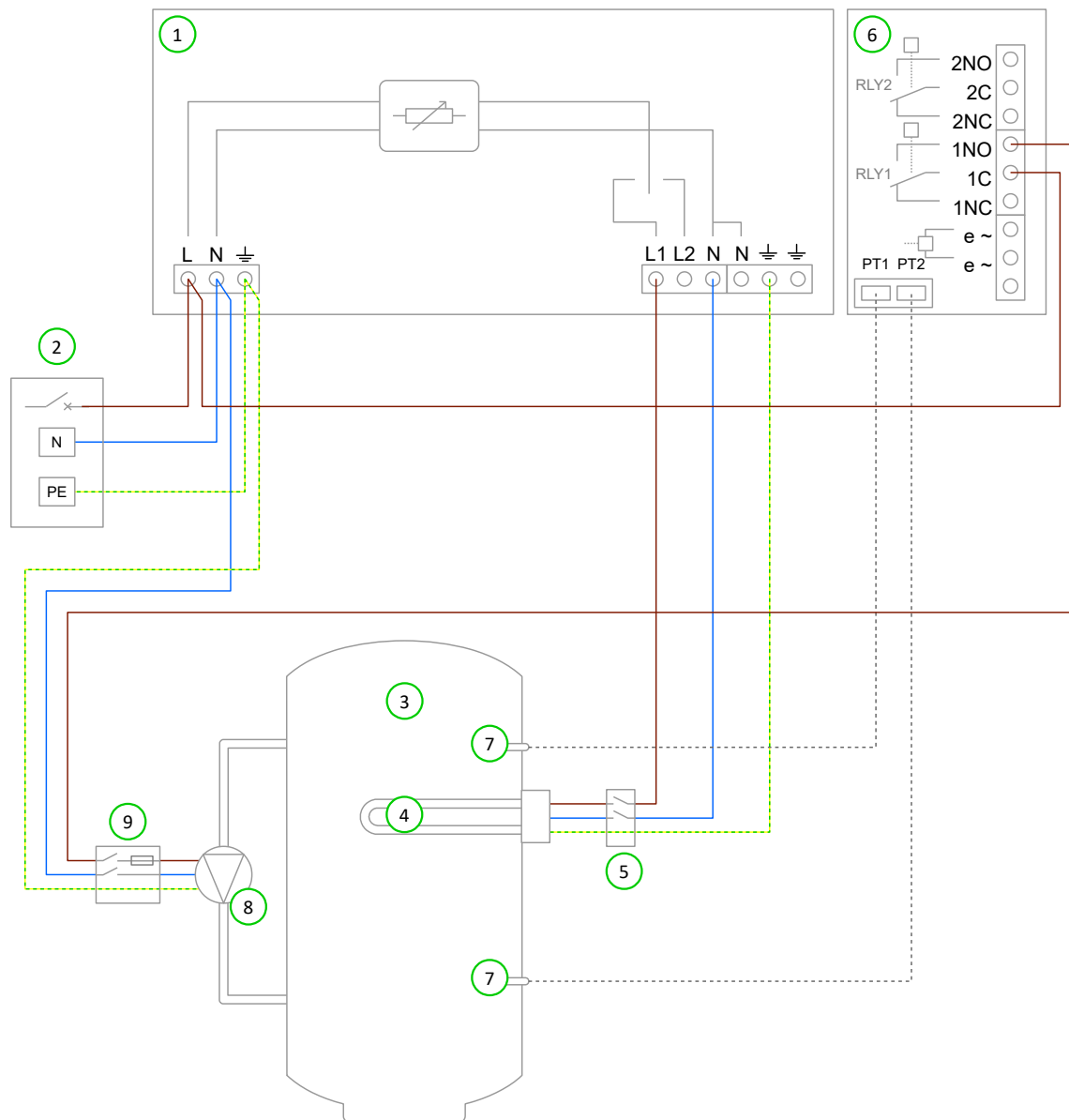
Key for Wiring Diagram 8

1. eddi device
2. Mains supply (230V AC from B16 circuit breaker or 13A fused spur)
3. Hot water cylinder
4. Water heating element (max. 3.7kW)
5. Isolator (20A double pole)
6. Relay & Sensor Board (optional add-on for eddi)
7. Temperature probe (type PT1000) (optional)
8. De-stratification pump
9. Switched fused spur for pump (5A)

Functional Description

Hot water cylinders that are normally heated by a gas or oil boiler often have an immersion heater installed in the top half of the cylinder. This means only about half of the water can be heated with electric. With the addition of a de-stratification pump, almost the entire volume of the hot water cylinder can be fully heated.

The water in the cylinder (3) is heated via the immersion heater (4) with surplus power until the thermostat has opened, then eddi will run the pump (8) for up to five minutes. This pushes some of the hot water from the top of the cylinder (3), down to the bottom, thus pulling the cooler water up to the region that can be heated via the immersion heater (4). As the cooler water is drawn up, the thermostat will close again and eddi is able to resume heating the water.

An auxiliary heat source (e.g. a gas boiler) is set to heat the water either early in the morning or later in the evening, depending on the home owners' lifestyle. Heating the water during times of generation (e.g. daylight hours) is best avoided to allow maximum capacity for the surplus energy.

Installation of the temperature probes (7) is optional; the immersion heaters' mechanical thermostat is used by eddi if water temperature reading is not required.

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Top Immersion
				Heater 2:	None
Advanced Menu…	Relays & Sensors…	Relay 1…	Heating…		Destrat 1

9: Water Heater with Auxiliary Boiler Control – Y Plan
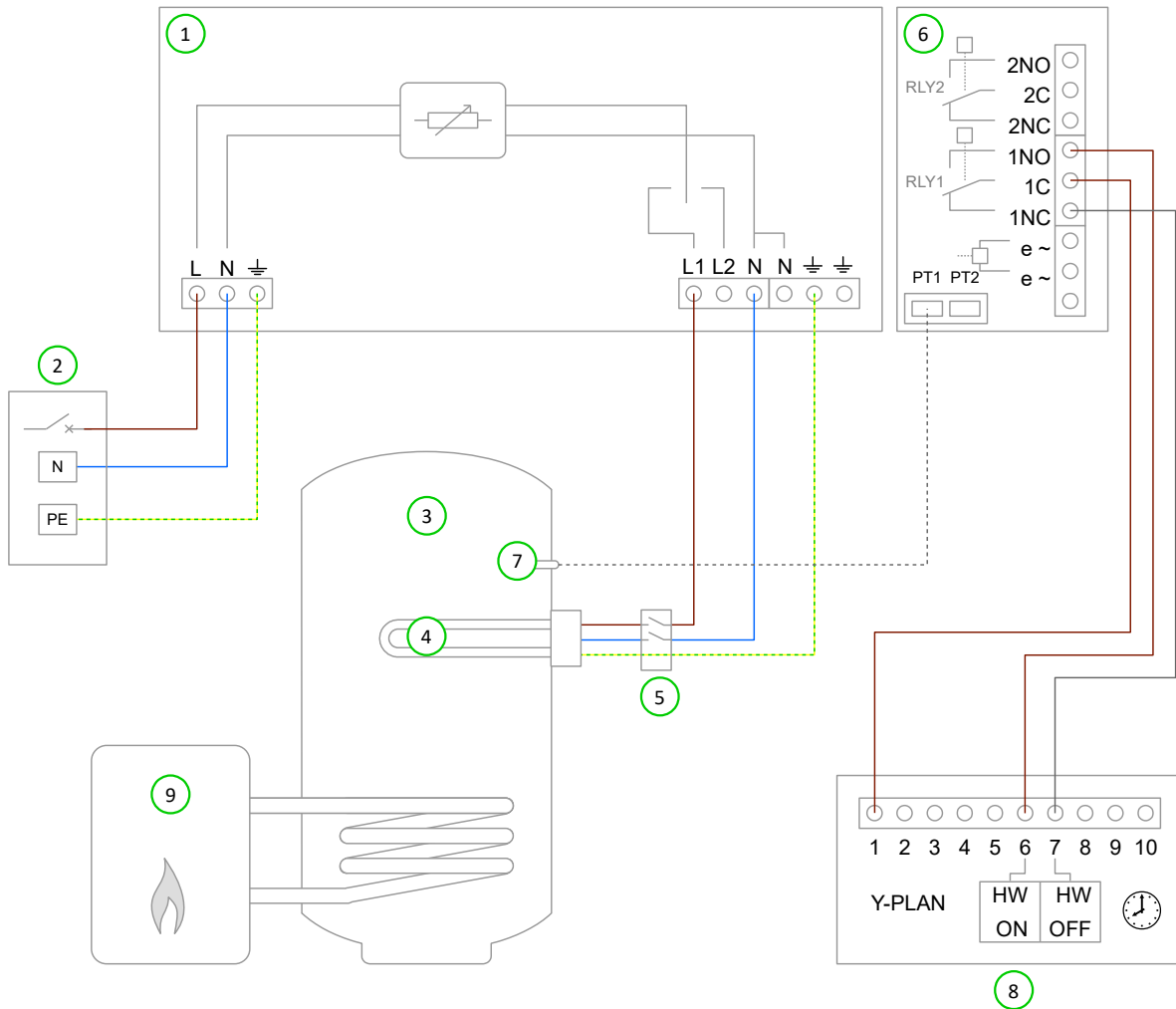
Key for Wiring Diagram 9

① eddi device

② Mains supply (230V AC from B16 circuit breaker or 13A fused spur)

③ Hot water cylinder

④ Water heating element (max. 3.7kW)

⑤ Isolator (20A double pole)

⑥ Relay & Sensor Board (optional add-on for eddi)

⑦ Temperature probe (type PT1000) (optional)

⑧ Y-Plan wiring centre

⑨ Auxiliary water heating boiler

Functional Description

As eddi is predominately a water heating control device, it can be used to manage all of the water heating, even if an auxiliary heat source is used to heat the water. With this application the homeowner will be able to program auxiliary boiler boost times with eddi.

In the UK a popular plumbing and wiring scheme used by central heating systems is referred to as 'Y-Plan'. This scheme has a standard junction box which eddi can be wired to, to enable programming of water heating times with the BOOST TIMER feature of the eddi.

The water heating element (4) is wired to the Heater 1 output and Relay 1 of the Relay & Sensor Board (6) is wired to the Y-Plan wiring centre (8). Any existing water heating control is removed or disconnected.

The water in the cylinder (3) is heated with only surplus power until the thermostat has opened, the eddi will display Max Temp Reached and the surplus power will then be exported until the water cools, heating will then resume.

The BOOST TIMER (RELAY 1) in the eddi is used to program the auxiliary heat source (e.g. a gas boiler) to heat the water either early in the morning or later in the evening, depending on the home owners' lifestyle. Heating the water during times of generation (e.g. daylight hours) is best avoided to allow maximum capacity for the surplus energy.

Whenever the boost is active, Relay 1 will operate and the Y-plan heating system will respond, heating the water via the auxiliary boiler.

The BOOST TIMER (HEATER 1) can be used if it is desired to boost water heating with the immersion heater.

Installation of the temperature probe (7) is optional; the immersion heaters' mechanical thermostat is used by eddi if water temperature reading is not required.

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Water Top
				Heater 2:	None
Advanced Menu…	Relays & Sensors…	Temperatures…			Set Temperatures as required if using temperature probes
		Relay 1…			Boost Timer

10: Water Heater with Auxiliary Boiler Control – S Plan
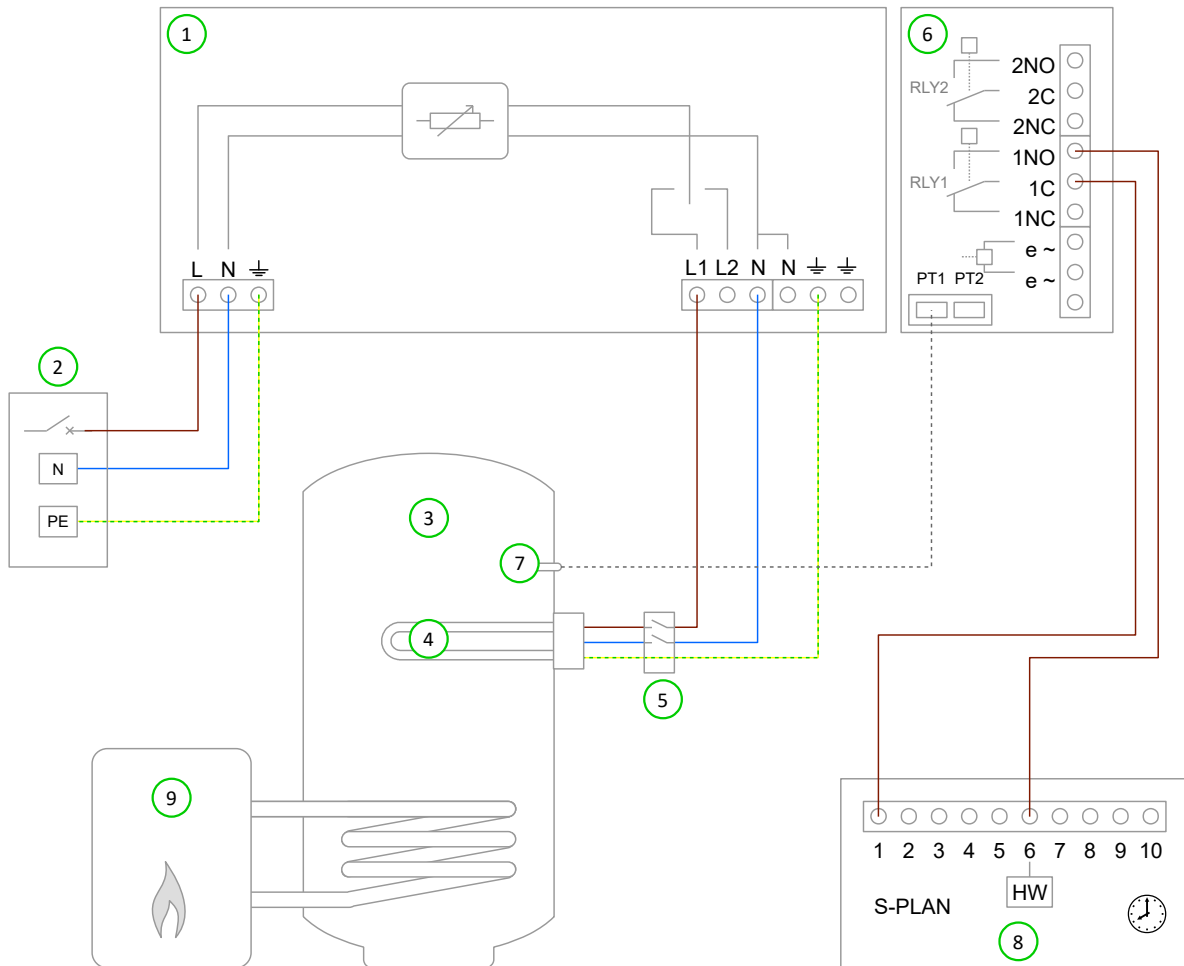
Key for Wiring Diagram 10

① eddi device

② Mains supply (230V AC from B16 circuit breaker or 13A fused spur)

③ Hot water cylinder

④ Heating element (max. 3.7kW)

⑤ Isolator (20A double pole)

⑥ Relay & Sensor Board (optional add-on for eddi)

⑦ Temperature probe (type PT1000) (optional)

⑧ S-plan wiring centre

⑨ Auxiliary water heating boiler

Functional Description

As eddi is predominately a water heating control device, it can be used to manage all of the water heating, even if an auxiliary heat source is used to heat the water. With this application the homeowner will be able to program auxiliary boiler boost times with eddi.

In the UK a popular plumbing and wiring scheme used by central heating systems is referred to as 'S-Plan'. This scheme usually has a standard junction box which eddi can be wired to, to enable programming of water heating times with the BOOST TIMER feature of the eddi.

The water heating element (4) is wired to the Heater 1 output and Relay 1 of the Relay & Sensor Board (6) is wired to the S-Plan wiring centre (8). Any existing water heating control is removed or disconnected.

The water in the cylinder (3) is heated with only surplus power until the thermostat has opened, the eddi will display Max Temp Reached and the surplus power will then be exported until the water cools, heating will then resume.

The BOOST TIMER (RELAY 1) in the eddi is used to program the auxiliary heat source (e.g. a gas boiler) to heat the water either early in the morning or later in the evening, depending on the home owners' lifestyle. Heating the water during times of generation (e.g. daylight hours) is best avoided to allow maximum capacity for the surplus energy.

Whenever the boost is active, Relay 1 will operate and the S-plan heating system will respond, heating the water via the auxiliary boiler.

The BOOST TIMER (HEATER 1) can be used if it is desired to boost water heating with the immersion heater.

Installation of the temperature probe (7) is optional; the immersion heaters' mechanical thermostat is used by eddi if water temperature reading is not required.

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Water Top
				Heater 2:	None
Advanced Menu…	Relays & Sensors…	Temperatures…			Set Temperatures as required if using temperature probes
		Relay 1…			Boost Timer

11: Heat Pump with Water Heating
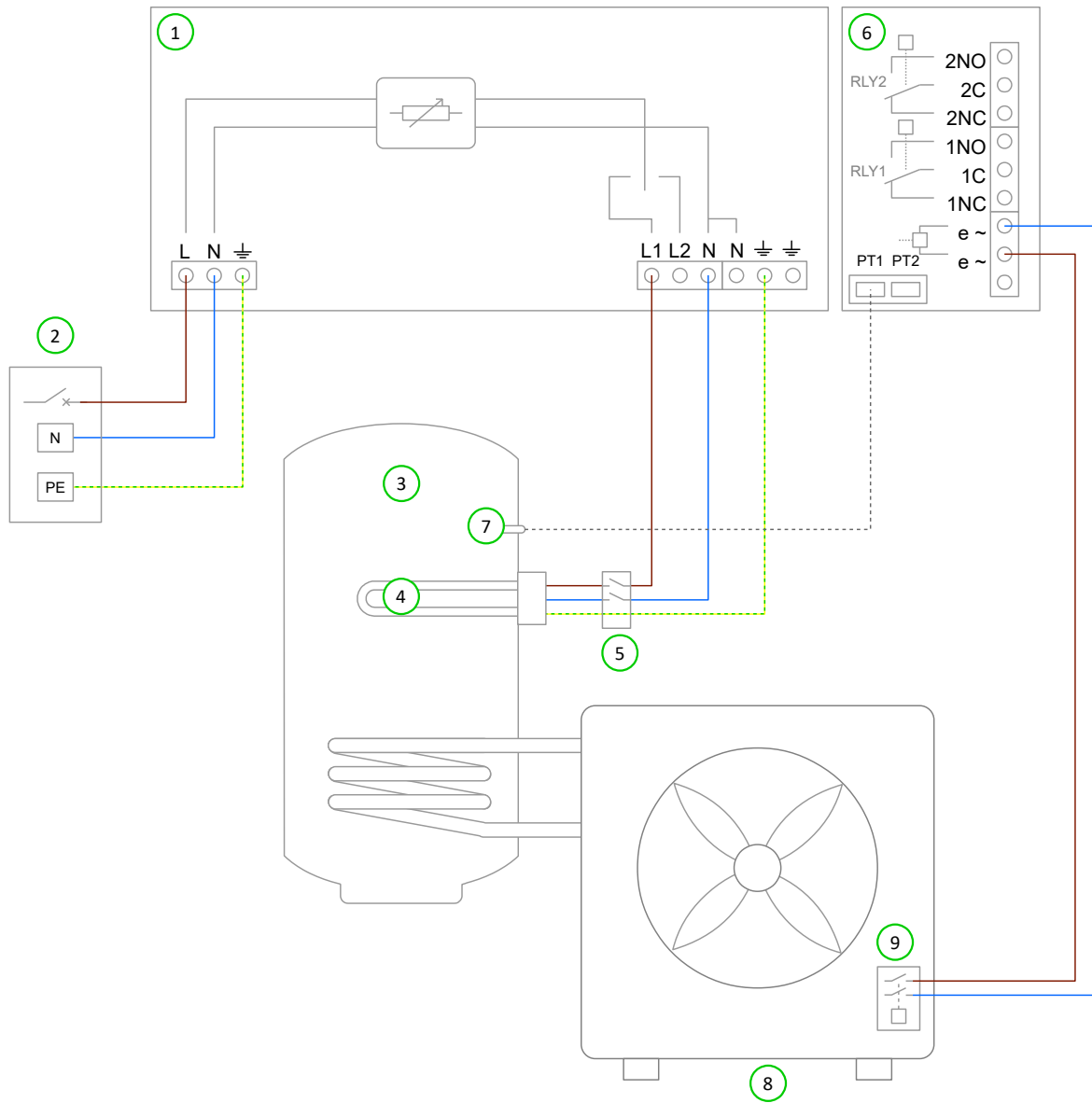
Key for Wiring Diagram 11

(1) eddi device

(2) Mains supply (230V AC from B16 circuit breaker or 13A fused spur)

(3) Hot water cylinder

(4) Heating element (max. 3.7kW)

(5) Isolator (20A double pole)

(6) Relay & Sensor Board (optional add-on for eddi)

(7) Temperature probe (type PT1000) (optional)

(8) Heat Pump (with immersion heater output)

(9) Heat pump immersion heater relay

Functional Description

Most heat pumps require control of the immersion heater in the hot water cylinder, this is to periodically heat the water to a higher temperature in order to kill any Legionella bacteria that may have built up in the stored water. This application enables the heat pump to effectively control the immersion heater when required whilst the heater is actually connected only to the eddi.

eddi uses the Grid Sensor to monitor any surplus power that would otherwise be exported to the grid and diverts the same amount of power to the heater loads, thereby reducing the surplus power down to zero.

It is not permissible to 'back-feed' the eddi device (i.e. a voltage supply must not be connected to the heater outputs). Because of this, the heat pump immersion heater relay (9) needs to be connected to the eSense input of the Relay & Sensor Board (6) instead of the immersion heater element (4). In this application, the eddi is configured to respond to the eSense signal by fully switching on Heater 1 output regardless of available surplus.

Installation of the temperature probe (7) is optional; the heaters' mechanical thermostat can be used instead if water temperature reading is not required.

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Top Immersion / Bottom Immersion
				Heater 2:	None
Advanced Menu…	Relays & Sensors…	Temperatures…	PT1 Set Point:		Set Temperature as required if using temperature probe
		eSense Input…	Boost…		Heater 1

Application Examples

12: Heat Pump with Water Heating and Buffer Tank
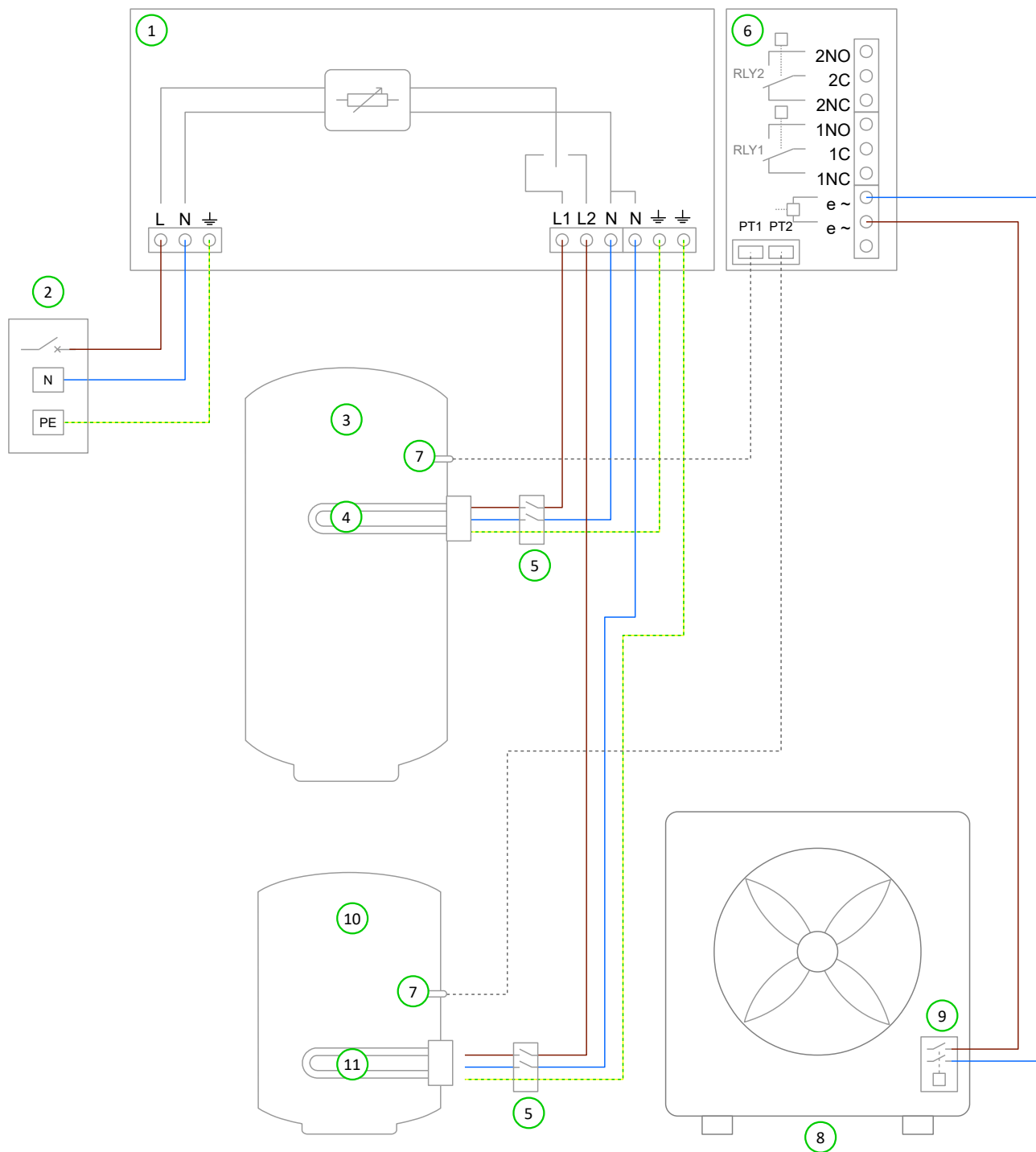
Key for Wiring Diagram 12

(1) eddi device

(2) Mains supply (230V AC from B16 circuit breaker or 13A fused spur)

(3) Hot water cylinder

(4) Heating element 1 (max. 3.7kW)

(5) Isolator (20A double pole)

(6) Relay & Sensor Board (optional add-on for eddi)

(7) Temperature probe (type PT1000) (optional)

(8) Heat Pump (with immersion heater output)

(9) Heat pump immersion heater relay

(10) Buffer cylinder

(11) Heating element 2 (max. 3.7kW)

Functional Description

Some heat pump heating systems have a buffer tank for the heating circuit as well as a hot water cylinder.

eddi can be used to make good use of any surplus generation by fully heating the water first and then heating the buffer, allowing the maximum amount of surplus energy to be stored.

eddi uses the Grid Sensor to monitor any surplus power that would otherwise be exported to the grid and diverts the same amount of power to the heater loads, thereby reducing the surplus power down to zero.

For this application two heating elements are wired to the eddi; the water immersion heater (4) is connected to Heater 1 output and the buffer tank immersion heater (11) is connected to Heater 2 output. Priority is given to the water heating and only when fully heated does the eddi switch to heating the buffer tank.

Most heat pumps require control of the immersion heater in the hot water cylinder, this is to periodically heat the water to a higher temperature in order to kill any Legionella bacteria that may have built up in the stored water. Remember it is not permissible to 'back-feed' the eddi device; a voltage supply must not be connected to the heater outputs. Because of this, the heat pump immersion heater relay (9) needs to be connected to the eSense input of the Relay & Sensor Board (6) instead of the immersion heater element (4). In this application, the eddi is configured to respond to the eSense signal by fully switching on Heater 1 output regardless of available surplus.

Installation of the temperature probes (7) is optional; the heaters' mechanical thermostat can be used instead if temperature readings are not required.

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Top Immersion
				Heater 2:	Radiator / Underfloor Heating
		Priority…			Heater 1
Advanced Menu…	Relays & Sensors…	Temperatures…			Set Temperatures as required if using temperature probes
		eSense Input…	Boost…		Boost 1

Application Examples

13: Heat Pump with Water Heating and Priority Control
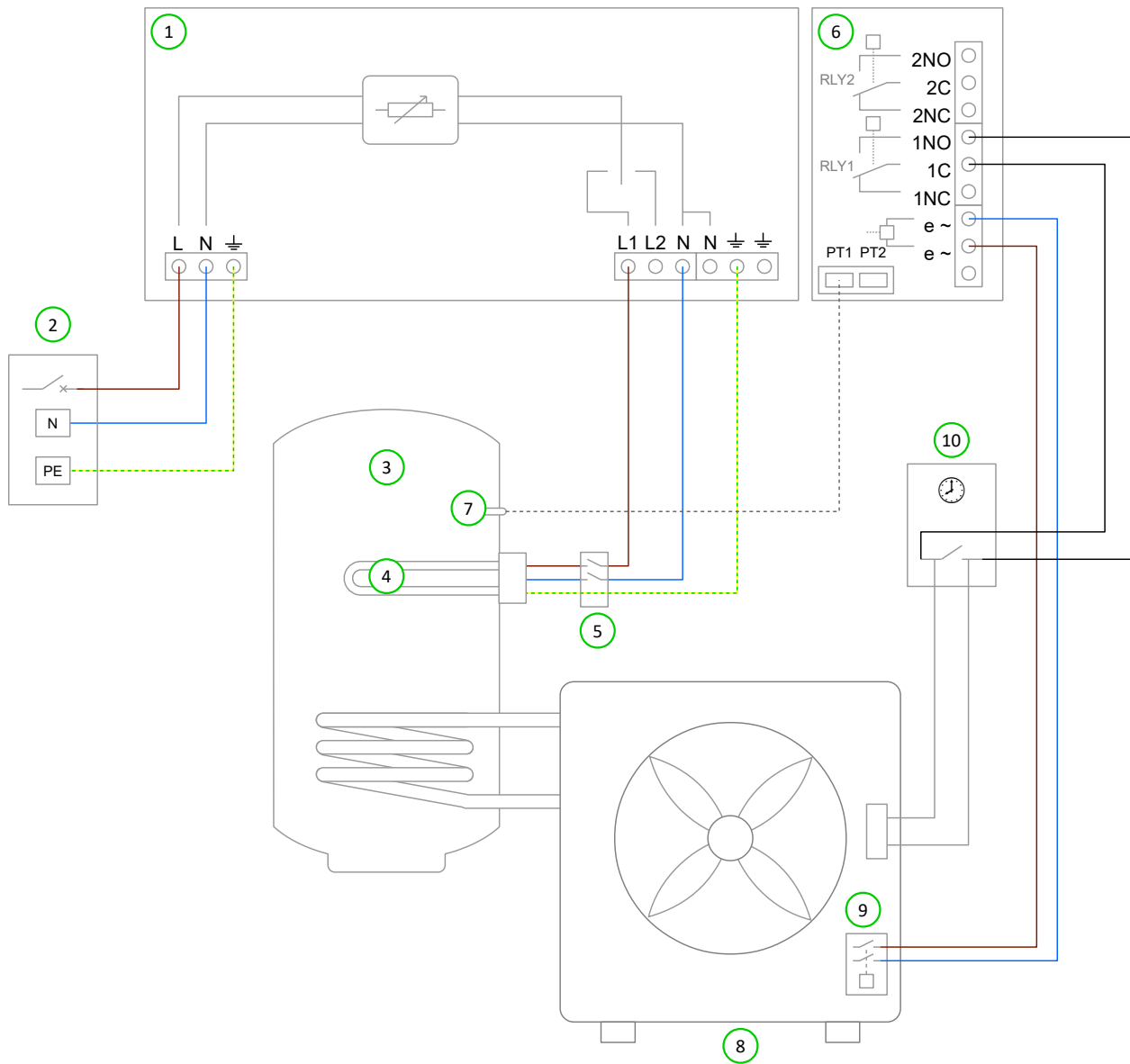
Key for Wiring Diagram 13

① eddi device

② Mains supply (230V AC from B16 circuit breaker or 13A fused spur)

③ Hot water cylinder

④ Heating element (max. 3.7kW)

⑤ Isolator (20A double pole)

⑥ Relay & Sensor Board (optional add-on for eddi)

⑦ Temperature probe (type PT1000) (optional)

⑧ Heat pump (with immersion heater output)

⑨ Heat pump immersion heater relay

⑩ Heat pump hot water timer

Functional Description

In this application the water is heated by eddi with the immersion heater when there is a relativity small amount of surplus power (e.g. < 1kW). But when there is enough surplus the heat pump is used to heat the water instead. This configuration takes advantage of the higher efficiency of the heat pump compared with the immersion heater, whilst ensuring no surplus power is wasted.

For this application the water heating element (4) is wired to the eddi Heater 1 output. The water heating timer control (10) for the heat pump (8) is connected to the Relay 1 normally open contacts of the Relay & Sensor Board (6).

Most heat pumps require control of the immersion heater in the hot water cylinder, this is to periodically heat the water to a higher temperature in order to kill any Legionella bacteria that may have built up in the stored water. Remember it is not permissible to 'back-feed' the eddi device; a voltage supply must not be connected to the heater outputs. Because of this, the heat pump immersion heater relay (9) needs to be connected to the eSense input of the Relay & Sensor Board (6) instead of the immersion heater element (4). In this application, the eddi is configured to respond to the eSense signal by fully switching on Heater 1 output regardless of available surplus.

Installation of the temperature probe (7) is optional; the heaters' mechanical thermostat can be used instead if temperature reading is not required.

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Top Immersion
				Heater 2:	None
		Priority…			Heater 1
Advanced Menu…	Relays & Sensors…	Temperatures…	PT1 Set Point:		If PT1 temperature probe is used, set temperatures as desired for water heating e.g. 60°C
		Relay 1…	Export…	On Threshold:	Should be set to power level required for efficient heap pump operation e.g. 1kW
				Off Threshold:	50% of On Threshold e.g. 500W
				Inc Diverted:	YES
				Min On Time:	Set this to reduce cycling of heat pump e.g. 15m
				Min Off Time:	Set this to reduce cycling of heat pump e.g. 5m
		eSense Input…	Boost…		Heater 1

14: Pool and Water Heating
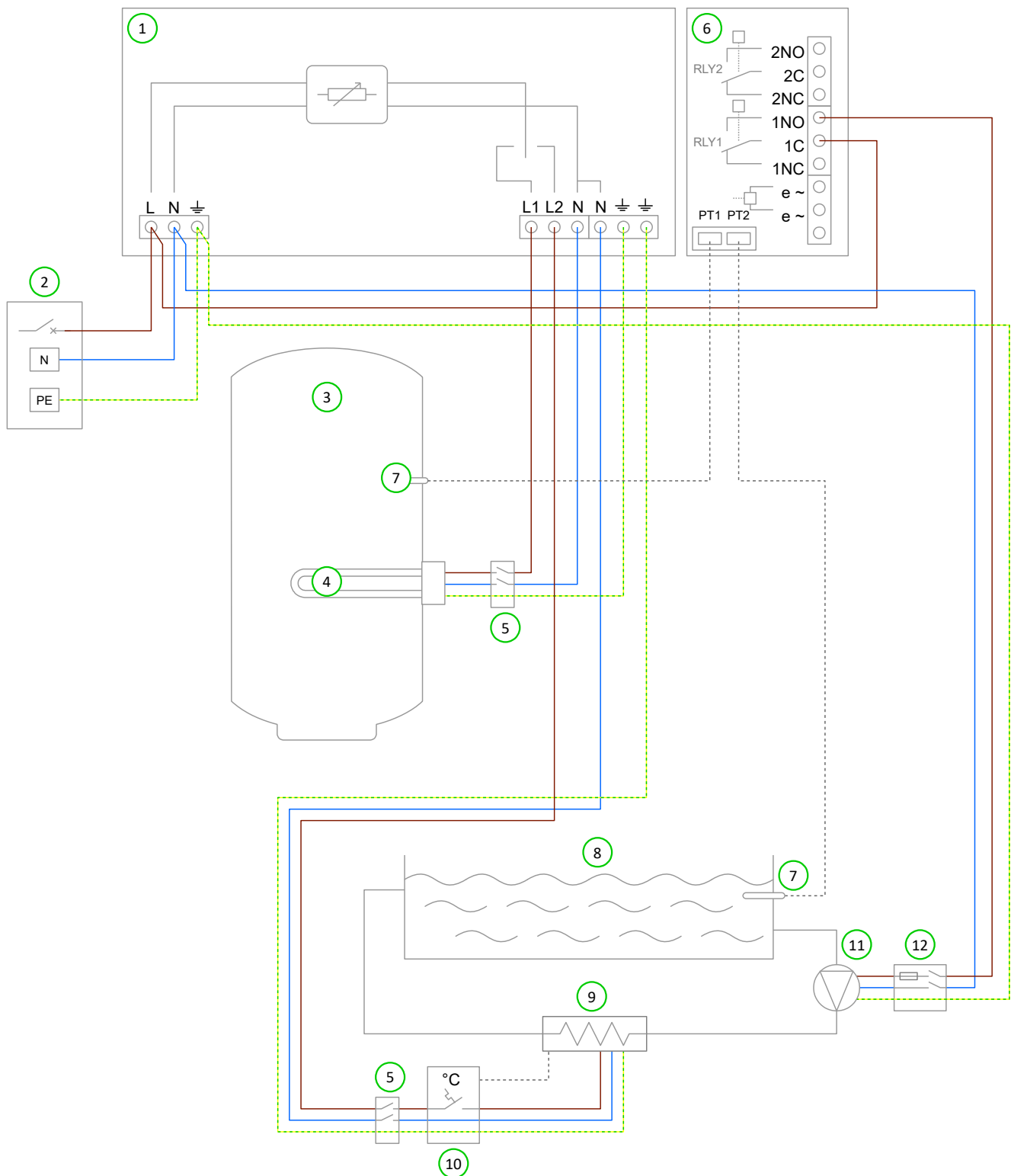
Key for Wiring Diagram 14

(1) eddi device

(2) Mains supply (230V AC from B16 circuit breaker or 13A fused spur)

(3) Hot water cylinder

(4) Water heating element (max. 3.7kW)

(5) Isolator (20A double pole)

(6) Relay & Sensor Board (optional add-on for eddi)

(7) Temperature probe (type PT1000) (optional)

(8) Swimming pool

(9) In-line electric pool heater (max. 3.7kW)

(10) Pool heater thermostat (16A rated)

(11) Pool circulation pump

(12) Pool circulation pump fused spur

Functional Description

In properties that benefit from a swimming pool, eddi can be used to maximise self-consumption of surplus power, by first heating the domestic water before switching to divert the surplus power to contribute to pool heating.

Heater 1 (the immersion heater in the hot water cylinder) (4) is heated with surplus power until the domestic water is hot and the thermostat opens, then eddi will immediately switch over to Heater 2 to heat the pool (8) with surplus power.

During heating of the pool (Heater 2), eddi will briefly switch back to the domestic water heater (Heater 1) every 15 mins to check if it can store any more heat.

When Heater 2 is active (i.e. eddi is heating the pool), Relay 1 of the Relay & Sensor Board (6) will be on and so the pool circulation pump (11) will run thus transferring heat from the pool heater (9) to the swimming pool.

Installation of the temperature probes (7) is optional; the heaters' mechanical thermostats are used by eddi if temperature readings are not required.

Settings Required

Menu Option					Settings
Main Menu	Settings…	Display…	Icons…	Heater 1:	Top Immersion / Bottom Immersion
				Heater 2:	Pool
		Priority…			Heater 1
Advanced Menu…	Relays & Sensors…	Temperatures…			Set Temperatures as required if using temperature probes
		Relay 1…	Heating…		Heater 1

Troubleshooting

Symptom	Cause	Solution
Display is blank and power-on (green) indicator is NOT illuminated	- The bypass switch is in the off position - There is no power to the unit	- Switch the bypass switch (at the bottom of the unit) to the ON position - Check for correct supply voltage at the supply screw terminals (220 - 250V AC)
Display is blank, the power-on indicator (green) is NOT illuminated and Heater 1 indicator (blue) is lit	- The unit is in bypass mode	- Switch the bypass switch (at the bottom of the unit) to the on position
Display is blank and power-on indicator (green) is illuminated	- Possible faulty unit	- Contact your local Technical Support In the meantime, the bypass switch can be used to operate heater if needed
Heater not getting hot, yet display shows `Max Temp Reached` and the heater output indicator (blue) is lit	- Heater thermostat is open - Heater isolation switch is off - Heater element is faulty	- Check heater thermostat is closed - i.e. run off some hot water - Use the bypass switch to test the heater
Not using any surplus power and the display is always showing `Waiting for Surplus` and the export power is 0W	- Grid Sensor incorrectly installed - Faulty Grid Sensor - No signal from harvi (if used)	- Check the grid sensor is connected to CT1 terminals of the eddi or harvi - Check the Grid Sensor is installed on the correct cable (see *Grid CT* page 28) - Check resistance of the sensor - it should be around 200 Ω when not connected (remove the sensor from the cable before testing resistance) - If using harvi, check that the CT input has been set to `Grid` in the harvi settings (under `Devices` in the eddi menu)
Not using any surplus power and display is always showing `Waiting for Surplus`, yet the export power is displayed correctly	- `Export Margin` set too high	- Check `Export Margin` setting (default is 0W)
The power diverted to the heater is less than expected	- Heater has a lower rating than expected - The unit is too warm and is thermal limiting the output, (indicated by three wavy lines above the eddi icon)	- Check heater rating - Ensure the unit has adequate ventilation
The savings are less than expected (the diverted energy is low)	- Uncontrolled thermal input from other sources (e.g. gas boiler)	- Install or adjust controls for the auxiliary heat source
RCD tripping	- Live and neutral currents to heater are out of balance	- Ensure the heater neutral conductor is connected to "N" terminal of the "Heaters" screw terminal block in the eddi; do not use any other neutral
MCB tripped or supply fuse blown	- Possible faulty unit	- Contact your local Technical Support In the meantime, the bypass switch can be used to operate heater if needed

Fault Codes

Fault Code	Displayed Message	Description	Check
1	`Output Overload!`	Load is drawing too much current (>16A)	Check the power rating of connected heaters, the maximum rating is 3.7kW for each heater output
2	`Overheat!`	The device is too hot	Check ventilation slots are not blocked and the unit has sufficient space around it (see *Clearances on* page 25)
3	`No Signal!`	Signal lost from **harvi** device	Check **harvi** LED is blinking; if not, check sensors are securely clamped around the cable and properly connected to the terminals in the **harvi** **Note:** **harvi** will stop working if there is no power in the cable being monitored, however **eddi** will show this message only if there is no signal from **harvi** for more than 24hrs
4	`Grid Sensor Error!`	Grid Sensor incorrectly installed	Check the sensor is securely installed on the correct cable and is wired to the CT terminals with the correct polarity Refer to the *Grid CT* section (page 28) for details of correct installation
5	`Back-Feed Voltage!`	Unexpected voltage at heater output	The heater output terminals must never be connected to a supply voltage Check heater wiring
6	`Over Voltage!`	Supply voltage too high	The AC supply voltage must be less than 260V Check the AC voltage at SUPPLY terminals
7	`Under Voltage!`	Supply voltage too low	The AC supply voltage must be more than 190V Check the AC voltage at SUPPLY terminals
8	`Load Fault!`	Load is faulty	Check the power rating of connected heaters, the maximum rating is 3.7kW for each heater output Isolate the unit from the supply and check the resistant between L1 and N and between L2 and N at the HEATER terminals; the resistance should be between about 15 ΄Ω and 350 ΄Ω. **Note:** Around 18-20 ΄Ω is normal for an immersion heater.

Warranty

Subject to the provisions described below, this product is protected for three (3) years from the date of purchase or from the date of installation if registered **myenergi** within 3 months, against defects in material and workmanship.

Prior to returning any defective product to myenergi, the end customer must report the faulty product to **myenergi** by either emailing **myenergi** at **support@myenergi.uk** or calling **myenergi** on **+44 (0)333 300 1303**. If **myenergi** agrees that the product should be returned, it will issue a Return Merchandise Authorisation (RMA) number, the RMA must be clearly marked on the packaging of the product to be returned. **myenergi** may arrange collection at its discretion, otherwise the customer should return the product at their own cost.

Should the product fail to perform as described within the relevant warranted period as set out above, it will be repaired or replaced with the same or functionally equivalent product by **myenergi**, at its discretion, free of charge provided the end customer: (1) returns the failed product to **myenergi** with shipping charge prepaid, and (2) provides **myenergi** with proof of the original date of purchase. 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 **myenergi**, 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 does not apply if, in the judgement of **myenergi**, the product fails due to damage from shipment, handling, storage, incorrect installation, accident, inappropriate use or cleaning of the product, relocation of the product after its first installation, abuse, misuse, 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 or other identification markings removed or defaced.

Repair by anyone other than **myenergi** or an approved agent will void this warranty.

All defective products should be returned to **myenergi** with shipping charges prepaid, unless **myenergi** have arranged collection at its own cost.

Nothing in this agreement will affect the end customer's statutory rights or limit or exclude **myenergi'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 **myenergi** to exclude or restrict liability.

The maximum liability of **myenergi** under this warranty is limited to the purchase price of the product covered by the warranty.

myenergi only supply products for resale for domestic and private use. **myenergi** accept no liability for any commercial, business or re-sale purpose by the end customer, and **myenergi** accept no liability to the end customer for any loss of profit, loss of business, business interruption, or loss of business opportunity.

Technical Specifications

Performance

Power Control Technology	varisine™ pure sine wave PWM (Pulse Width Modulation)
Outputs	2 (sequential operation with selectable priority)
Bypass Switch	Integral On/Off/Bypass switch
Cooling	Rear mounted passive cooled heatsink
Indicators	LED indication: Supply On, Heater 1 and Heater 2 active
Display	Graphical LCD with LED backlight (shows heating status and savings data)
PWM Resolution	0.1% (output voltage step size)
Measurement Accuracy	+/- 1.5% (typical)
Power Conversion Efficiency	97.5% (typical)
Compliance	LVD 2014/35/EU, EMC 2014/30/EU EN60335-1:2012, EN55014-1:2006+A2:2011, EN55014-2:2015, EN61000-3-2:2014, EN61000-3-3:2013
Warranty	3 Years

Electrical Specifications

Rated Input Power	3.68kW
Rated Supply Voltage	230V AC Single Phase (+/- 10%)
Supply Frequency	50Hz / 60Hz
Rated Current	16A max. (determined by load)
Standby Power Consumption	3W
Generator Size Supported	No limit (subject to 100A per-phase grid supply)
Heater Load Size	100W min. 3.68kW max.
Economy Tariff Sense Input	230V AC sensing (2.5kV isolated)
Wireless Interface	868 MHz (proprietary protocol) for wireless sensor and remote monitoring options
Grid Current Sensor	100A max. primary current, 16mm max. cable diameter
Supply Cable Entry	Rear, bottom, or side option

Mechanical Specifications

Dimensions	220 x 205 x 87mm (excluding wall bracket)
Weight	4.3kg (excluding wall bracket)
Protection Degree	IP20
Enclosure Material	Painted Zintec steel
Operating Temperature	-20°C to +40°C
Mounting Method	Wall mounting bracket

Designed to permit installations compliant with IET Wiring Regulations BS7671 and the Electricity Safety, Quality, and Continuity Regulations 2002 and BS8300.

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