

# eddi

microgeneration energy diverter



## Installation Manual

MODELS: 16A1P01H

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## 1. 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 your myenergi product.

eddi is an automatic power controller. It 'tracks' available surplus power from a grid-tied PV or Wind turbine system and varies the power to your 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 your '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.

## 2. 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

## 3. Disposal

In accordance with European Directive 2012/19/EU on waste electrical and electronic equipment and its implementation in national law, used electrical devices **must** be collected separately and recycled in an environmentally responsible manner. In the UK these requirements are covered by The Waste Electric and Electronic Equipment (WEEE) Regulations 2013. 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.

## 4. 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.

myenergi zappi, myenergi eddi and myenergi harvi are registered trademarks of myenergi Ltd.

## 5. 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 microgeneration 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 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.

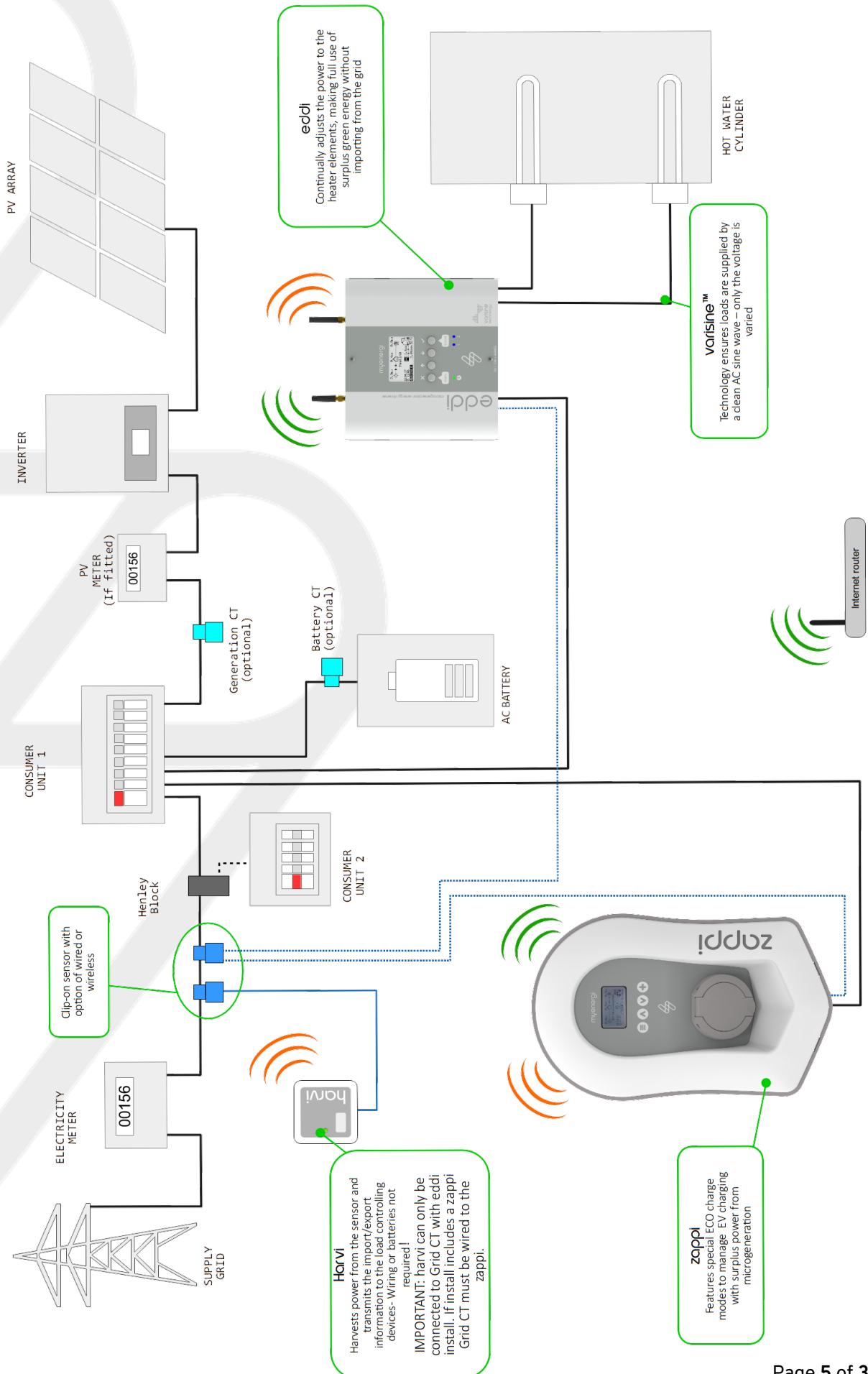
### Feature Set

- ⊗ 3.68kW nominal/16A max. heater load
- ⊗ Supports two heaters (subsequentially)
- ⊗ 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 (with the option of adding an Extended Warranty of 2 extra years)
- ⊗ Integrated WiFi for connecting to internet
- ⊗ RJ45 connector for the option of hardwired Ethernet connection

### 5.1 Overview Diagram

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

## Overview Diagram



## 6. Box Contents

- ⊗ 1 x eddi unit with mounting bracket attached
- ⊗ 1 x Current transformer with 5m cable (Grid CT sensor)
- ⊗ 2 x Antenna
- ⊗ 1 x Quick Start Guide
- ⊗ 1 x vHub & WiFi Operation Manual
- ⊗ 4x screws (for use on cable clamps)

### 6.1 Optional: Relay & Sensor Board

The relay sensor board is an optional add-on to the eddi and allows the use of multiple wiring configurations.

It includes:

- ⊗ Relays with a capacity for 16A
- ⊗ Two temperature sensor units (PT1000)
- ⊗ eSense input (isolated detection for economy tariff)

The two relays can be independently set for several functions or set to operate as a pair.

These functions include:

- ⊗ Export/Import Threshold
- ⊗ Operate when heating and timed operation
- ⊗ De-stratification pump control
- ⊗ Fault signal for BMS systems

## 7. Connectivity

### 7.1 Wireless Connection

myenergi devices use an 868MHz/915MHz wireless link to communicate with each other. Although this is usually more effective at passing through walls than a standard WiFi signal, radio communication can be affected by many factors such as:

- ⊗ the distance between the devices
- ⊗ the thickness of any walls that the signal has to pass through
- ⊗ wall construction and insulation materials
- ⊗ large metal objects such as washing machines, fridges, sinks and baths
- ⊗ mirrors
- ⊗ electronic products such as televisions
- ⊗ other wireless devices operating on the same radio frequency

Please consider the position of your myenergi devices carefully to ensure that they operate as planned.

Although the devices work in the majority of installations and our technical support team are available to provide help in setting up your system, we cannot guarantee the performance where circumstances beyond our control affect the performance of the wireless link.

If you have any concerns about the wireless performance then we would be pleased to answer your questions, but please consider that if a WiFi signal works OK then there is a very high probability that the myenergi devices will also work without any issues.

## 7.2 Ethernet or WiFi Connections

eddi's with the built-in vHub (identified by product code EDDI-2Hxxxx) are supplied with a built-in Ethernet port (RJ45) socket and WiFi to connect eddi to the local area network (LAN).

All myenergi internet capable devices should be connected to the internet via either WiFi or a hardwired Ethernet connection.

This version of the eddi can also act as the “gateway” or “hub” between all your myenergi devices and the myenergi server. The gateway device MUST be connected to the internet.

**Note:** harvi *can only be connected using a wireless link to the Master device*

If radio connection is not possible you have the option to tether two devices using an Ethernet cable. When pairing devices, they will automatically use the Ethernet link if available.

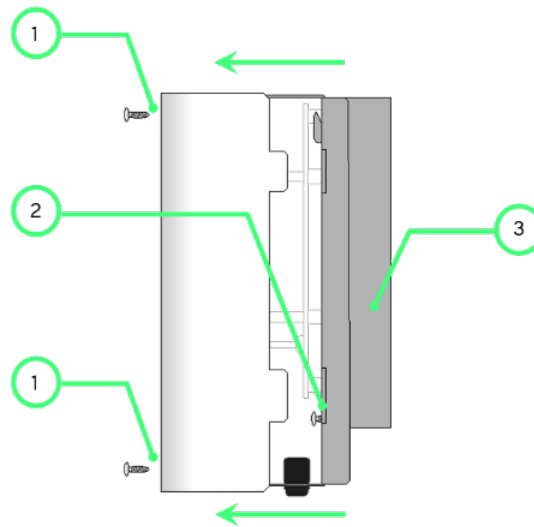
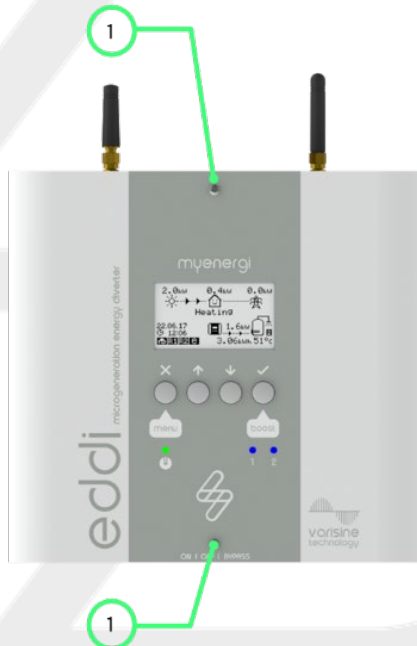
Further detail on the Ethernet connection and WiFi see separate vHub & WiFi manual.

## 8. Installation

### 8.1 Mounting

#### NOTE

- eddi is NOT suitable for installation outdoors
- Ensure the device always has adequate ventilation; do not block the vents or obstruct airflow at the back of the unit.
- eddi must be fixed to a flat vertical surface using the dedicated mounting bracket which comes attached to the unit.



**Step 1:** With the unit on its back on a flat surface, remove the front cover by unscrewing the two screws (1) on the front of the device and lifting it off.

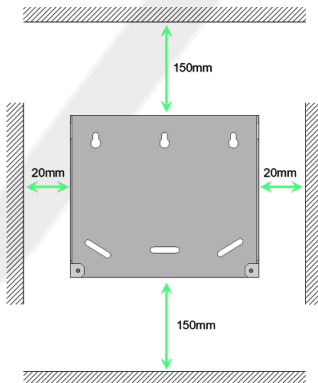
**Step 2:** Loosen the two mounting bracket securing screws (2) and separate the bracket (3) from the eddi.

**Step 3:** Place the bracket against the wall where you will be installing the device and mark the holes ready for drilling. (If fixing to timber stud you can use the two central vertically aligned points to screw the bracket directly into the timber.)

#### NOTE

Suitable fixings must be used dependant on application/mounting surface. To be determined by installer.

### 8.2 Clearances



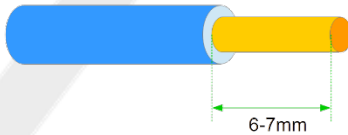


## 8.3 Wiring

### **WARNING!**

**ELECTRIC SHOCK** – 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.

### 8.3.1 Strip Length



### 8.3.2 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.

### 8.3.3 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
- ⊗ The loads 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

### 8.3.4 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.

### 8.3.5 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.



## 8.4 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.

### NOTE

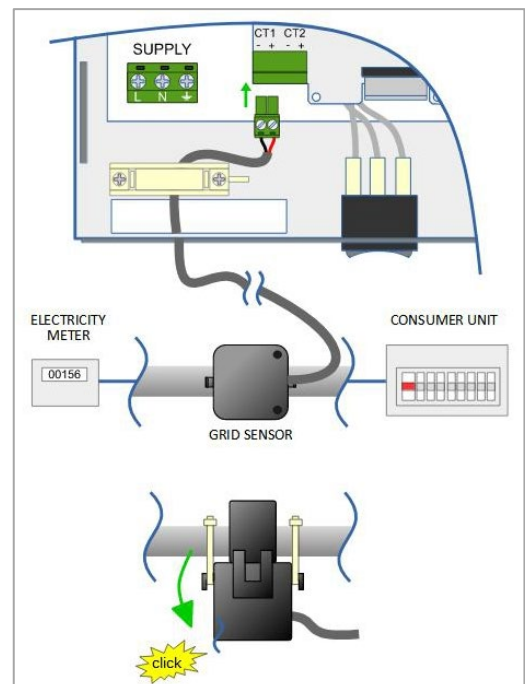
If a myenergi zappi EV Charger is configured it is not G100 compliant to use a harvi to measure grid CT.

#### 8.4.1 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 imported 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 sticker 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.



#### 8.4.2 Additional CTs

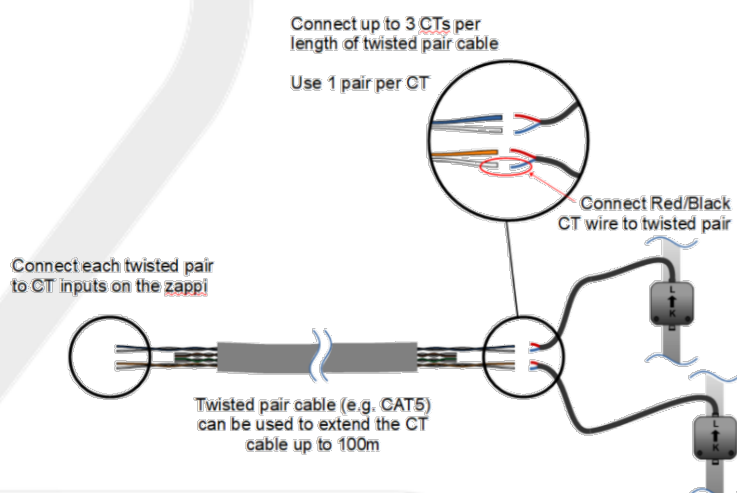
There is an option to add other CT sensors (available separately) for monitoring the generation or other appliances such as battery systems. Installing a CT for the generator (PV system) will allow the main screen to show the generated power and the total power consumption of all the other appliances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

CTs can also be used to limit the power drawn from the supply:

- ⊗ Additional CTs can be connected to any myenergi device with a CT input that is linked to the network
- ⊗ The arrow on the sticker 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 [+]

### 8.4.3 Extending CT Sensor Cable

If there is a need to extend the CT sensor, cable like CAT5 must be used (only use one pair).



#### IMPORTANT

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.

### 8.4.4 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 eddi products to be installed without using wired CT sensors for measuring the grid, generation power and/or battery storage system; 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 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.

#### NOTE

If a myenergi zappi EV Charger is configured it is not G100 compliant to use a harvi to measure grid CT.

### 8.4.5 CT Golden Rules – Grid CT

- ⊗ Only ONE 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).

### 8.4.6 All other CTs

- ⊗ Arrow should point towards the consumer unit.

### 8.4.7 3-phase harvi CTs

- ⊗ When using harvi in 3-phase mode, the CT inputs correspond to the phase number (e.g. CT1 = Phase 1). This helps to avoid phase shifting/phase misalignment.

#### 8.4.8 CT Can do's

- ⊗ Can be wired to ANY myenergi device in the network.
- ⊗ harvi can be used to make 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.

### 8.5 Advanced Installation Options

#### 8.5.1 Load Balancing/Current Limiting/Load Curtailment

CTs can also be used to limit the current drawn by myenergi devices to avoid overloading circuits; this is referred to as load balancing or load curtailment. 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
<b>Device Limit</b>	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.
<b>Grid Limit</b>	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.
<b>Group Limit (Internal CT)</b>	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.
<b>Group Limit (External CT)</b>	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.

### 8.5.2 Three-Phase Systems

If the installation supply is three-phase, it is recommended 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 3 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*. 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.

3 eddi units can be installed (1 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.

### 8.5.3 Battery Storage System

#### 8.5.3.1 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 allocate a CT sensor to monitor the battery storage; this will give control as to which device has priority. This 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*. Also refer to *Supply Grid – Battery* for information on setting 'priority' of battery systems.

#### 8.5.3.2 DC Coupled / Hybrid

Battery systems that charge directly from the solar array 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 the battery by setting an Export Margin in the eddi. A setting of 50W or 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* for details of how to configure CTs.

#### 8.5.3.3 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.

## 8.6 Relay & Sensor Board

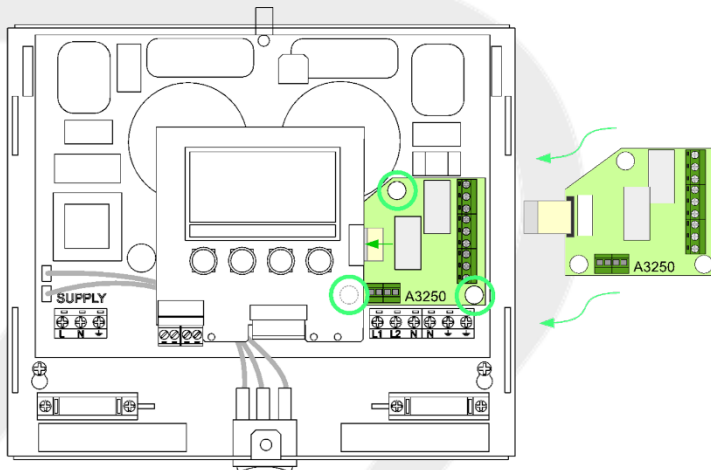
eddi has the option to install a Relay & Sensor Board (available separately). This allows for many different wiring configurations and includes the following features:

- ✧ 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* in this guide for practical examples.

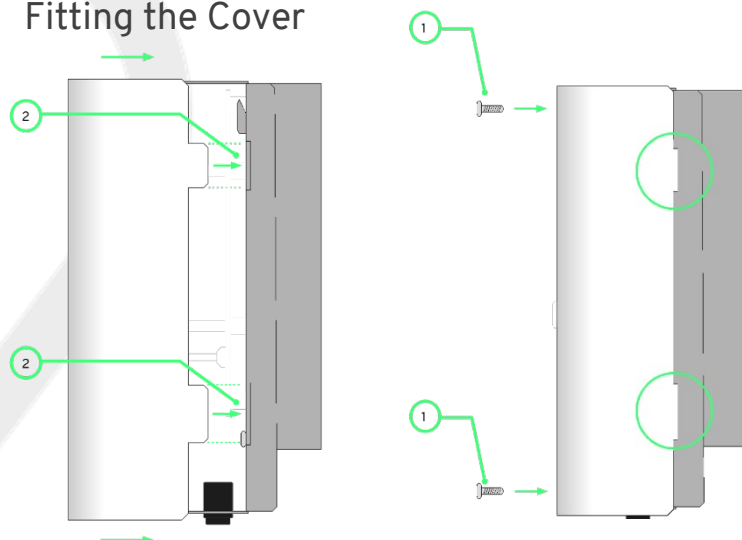


The Relay & Sensor Board is installed by plugging it into the eddi main circuit board using the three plastic spacers included with the Relay & Sensor Board.

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



## 8.7 Fitting the Cover



**Step 1:** Re-place and screw in the two mounting bracket securing screws (2).

**Step 2:** Re-place and screw in the two front cover screws (1)

## 9 Set-up

### 9.1 Switching On

After completing and checking the wiring of the supply, the heater(s) and the sensor(s):

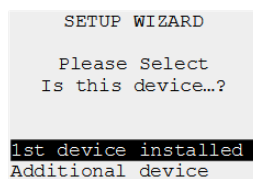
**Step 1:** Switch on the eddi via the circuit breaker or fused spur.

**Step 2:** If it's not already on – switch the ON/OFF and Bypass Switch (underneath the eddi) to the ON position.

**Step 3:** After the eddi starts-up for the first time, there will be a start-up wizard.

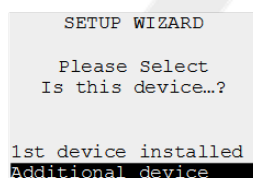
There are two likely scenarios here. Either this is your first myenergi device or you are adding this device to an existing myenergi home eco-system.

When you boot up your device you will see the below screen asking if this is “1<sup>st</sup> device installed” or whether you are integrating into an existing system (“Additional device”).



If you select “1<sup>st</sup> Device Installed” this sets the Master and vHub to ON at start up.

If you are integrating into a system that already has a ‘Hub’ or a myenergi device that is already set to ‘master’ select “Additional Device” and this will then set the Master and vHub on your new device to OFF.



**NOTE:** If you have 1 existing standalone myenergi device E.g. a zoppi only, you may need to select “1<sup>st</sup> device installed” – you will need to do this if your first device is not connected to the internet.



**NOTE**

- By default, the eddi is set to operate as in *Application Examples 1: Single Element Water Heater*. 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* for guidance on pairing devices. Also refer to the instruction documentation for the other devices

**NOTE – vHub & WiFi**

For instruction on vHub & WiFi Set-up please see separate vHub & WiFi Module Instructions.

## 9.2 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.

**Step 1:** Test the heaters by trying a manual boost, and check the power reading on the screen for the heater corresponds to the heater rating.

**Step 2:** Cancel the boost by pressing the button twice during the boost

**NOTE**

- 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.
- 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.

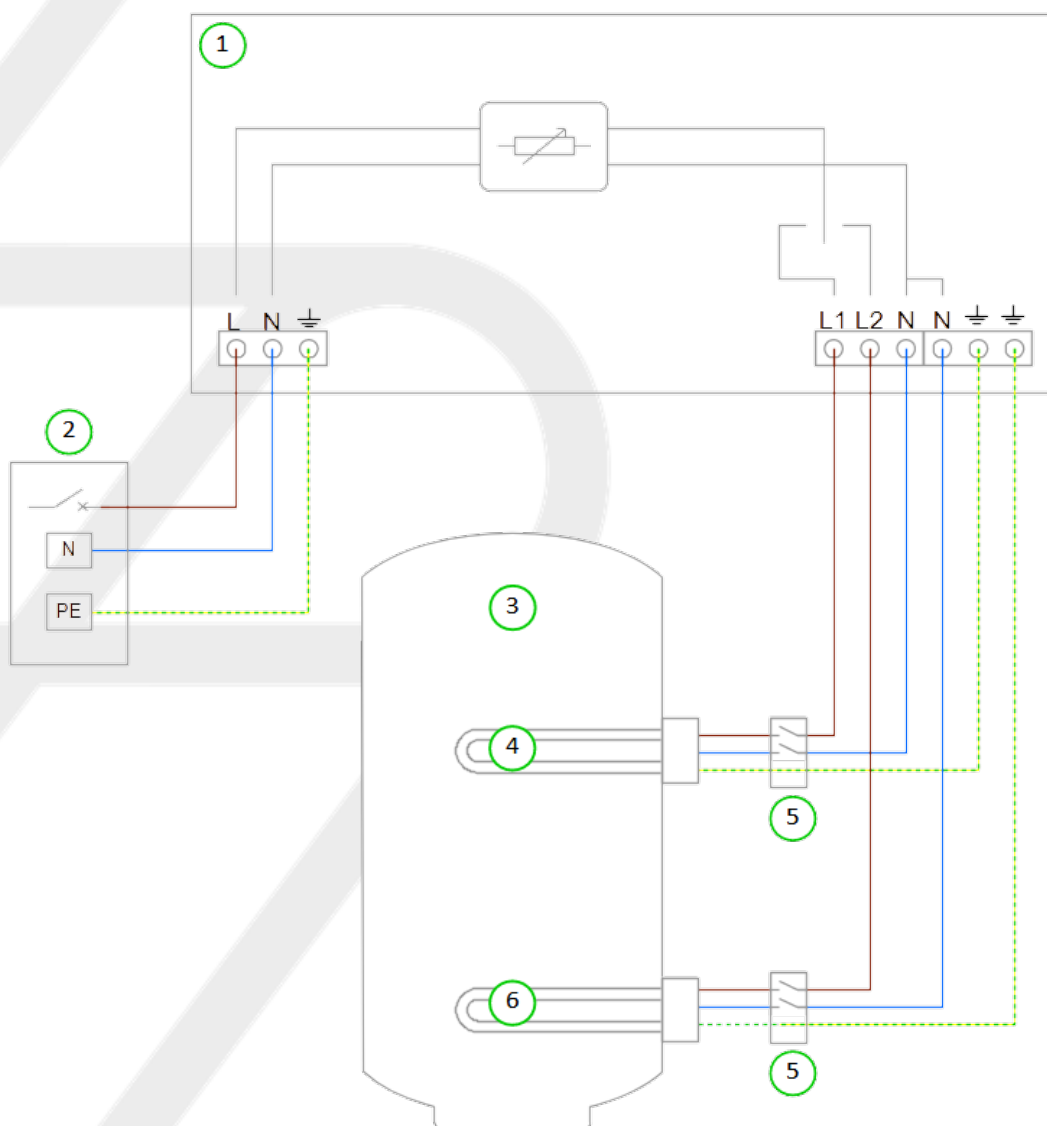
## 10 Application Examples

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.

### IF IN DOUBT...

Contact myenergi Technical Support – [support@myenergi.uk](mailto:support@myenergi.uk)

### 10.1 Dual Element Water Heater



#### 10.1.1 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)

### 10.1.2 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.

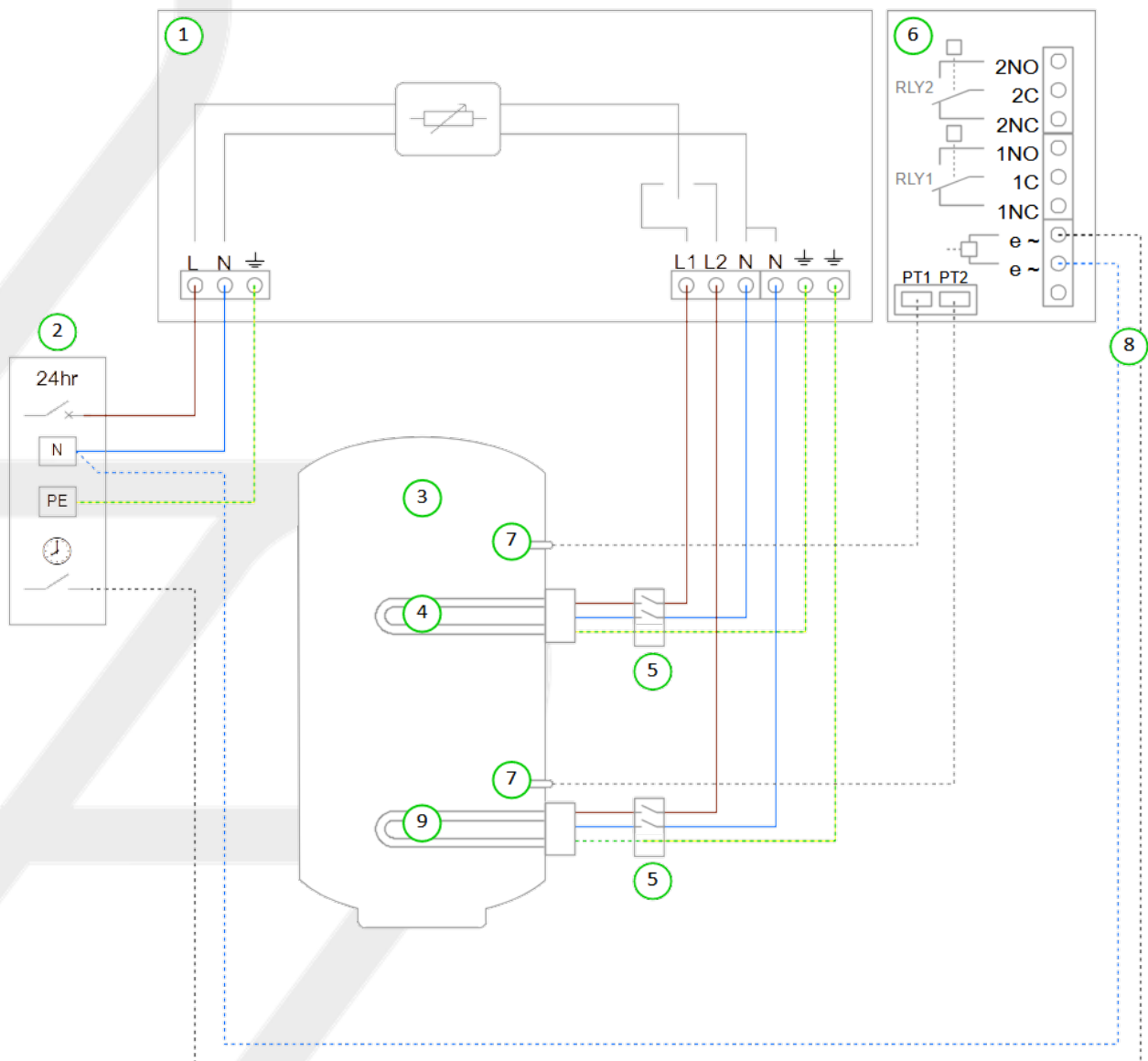
When the water is fully heated, any surplus power will be exported, eDDi will switch back to the priority heater and check the lower priority heater every 15 mins depending on your check period setting. The heating priority can be changed in the Main Menu > Heater Settings > Priority

This can be repeated in any scenario where there are 2 resistive heating elements i.e. radiator, underfloor heating mat

### 10.1.3 Settings Required

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

## 10.2 Economy Tariff with Dual Rate Meter



### 10.2.1 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 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) Economy rate electric sense wiring (live only when economy rate is available)
- (9) Heating element 2 (max.3.7kW)

### 10.2.2 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 depending on your check period setting. The heating priority can be changed in the Main Menu > Heater Settings > Priority

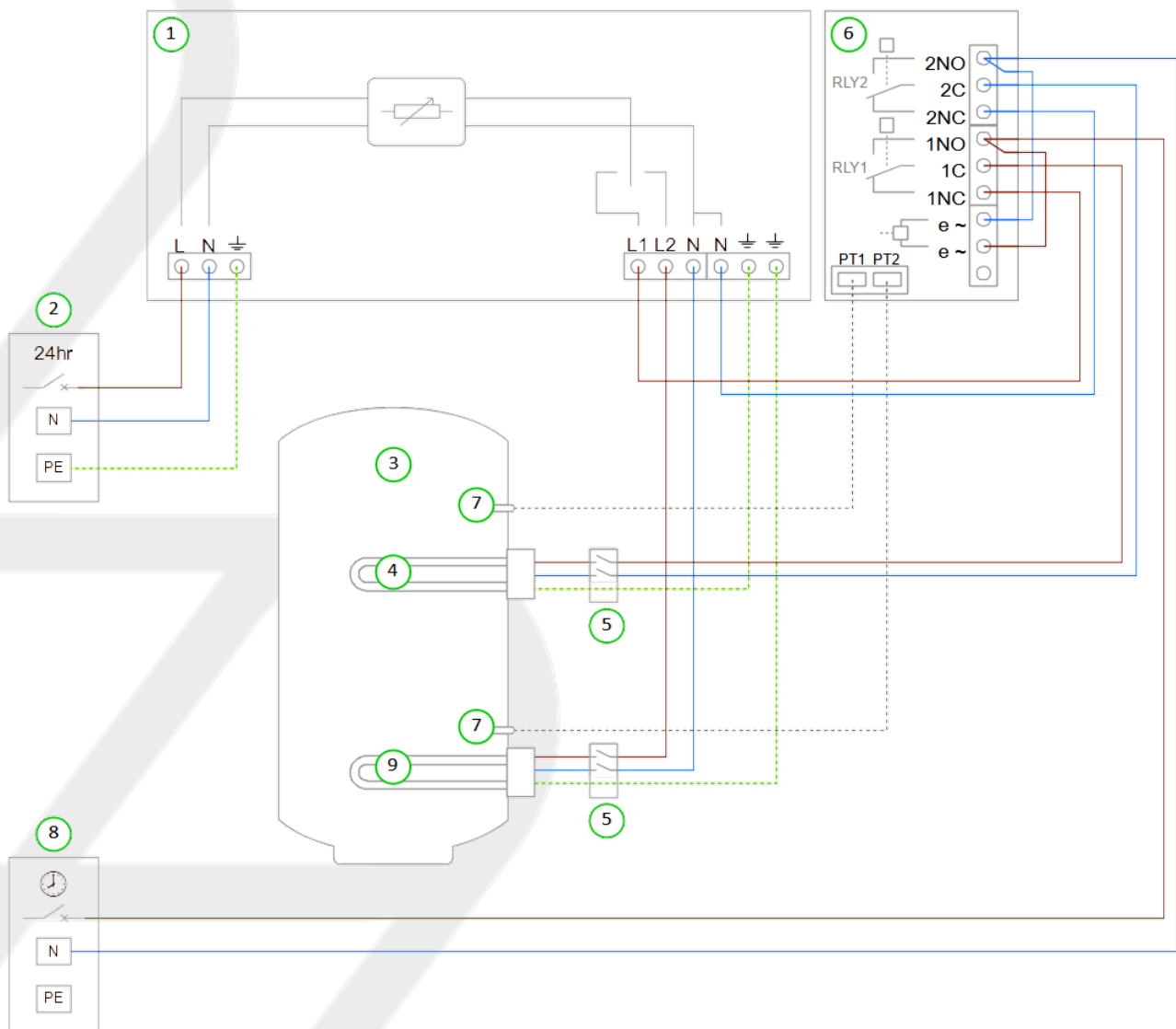
If eSense Input is set to Boost Enable 1 & 2, the BOOST TIMER screen for either heater will include an option to enable the boost timer only when the eSense input is live. In the BOOST TIMER, the e can be toggled on/off, if e is present, the boost will activate only when the boost times are valid and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

### 10.2.3 Settings Required

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

## 10.3 Economy Tariff with Separate Meters



### 10.3.1 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 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) Mains supply (off-peak timed) (230V AC from B16 circuit breaker or 13A fused spur)
- (9) Heating element 2 (max. 3.7kW)

### 10.3.2 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.

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 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.

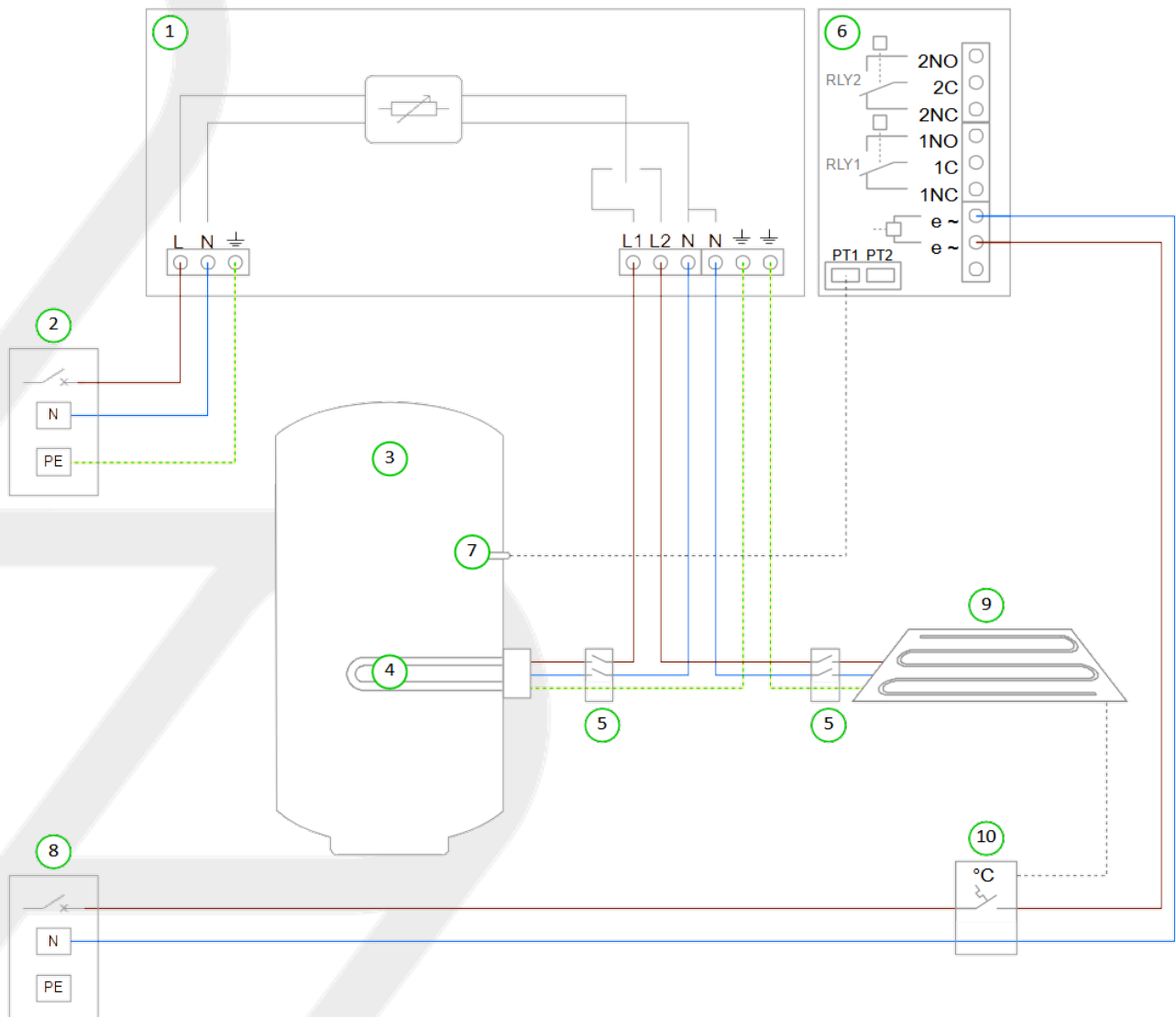
If eSense Input is set to Boost Enable 1, the BOOST TIMER screen for Heater 1 will include an option to enable the boost timer only when the eSense input is live. In the BOOST TIMER, the e can be toggled on/off, if e is present, the boost will activate only when the boost times are valid and the economy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

### 10.3.3 Settings Required

Menu Option					Settings
Main Menu	Settings...			Display...	Icons...
				Heater 1:	Top Immersion
				Heater 2:	Bottom Immersion
	Priority...				Heater 1
	Device Settings	Advanced	Relays & Sensors	Temperatures...	
				eSense Input...	Boost...
					Boost Enable 1 /Boost 1

## 10.4 Underfloor Heating Mat and Water Heating



### 10.4.1 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



#### 10.4.2 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.

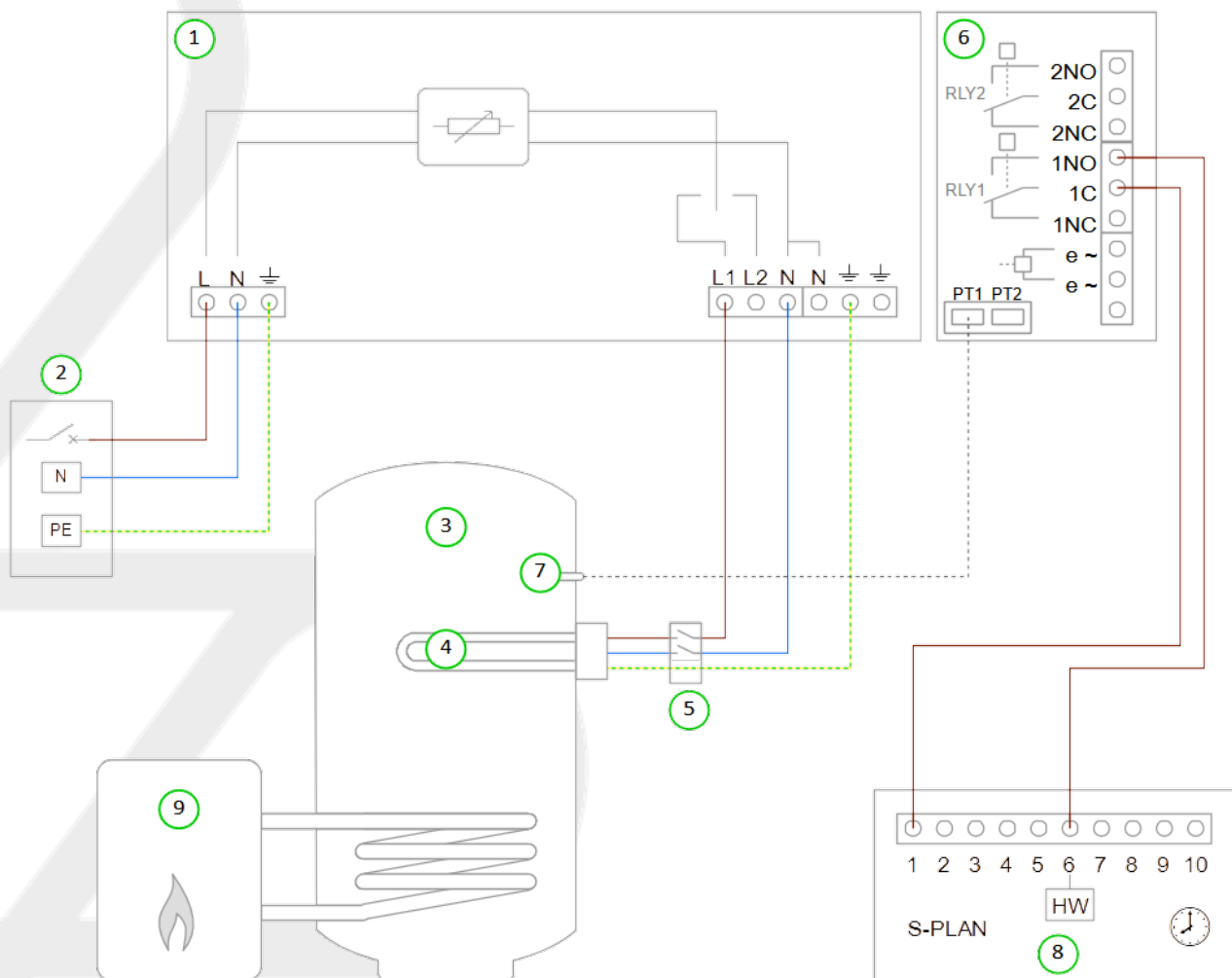
The heating priority can be changed in the Main Menu (Priority).

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.

#### 10.4.3 Settings Required

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

## 10.5 Water Heater with Auxiliary Boiler Control – S Plan



### 10.5.1 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

### 10.5.2 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.

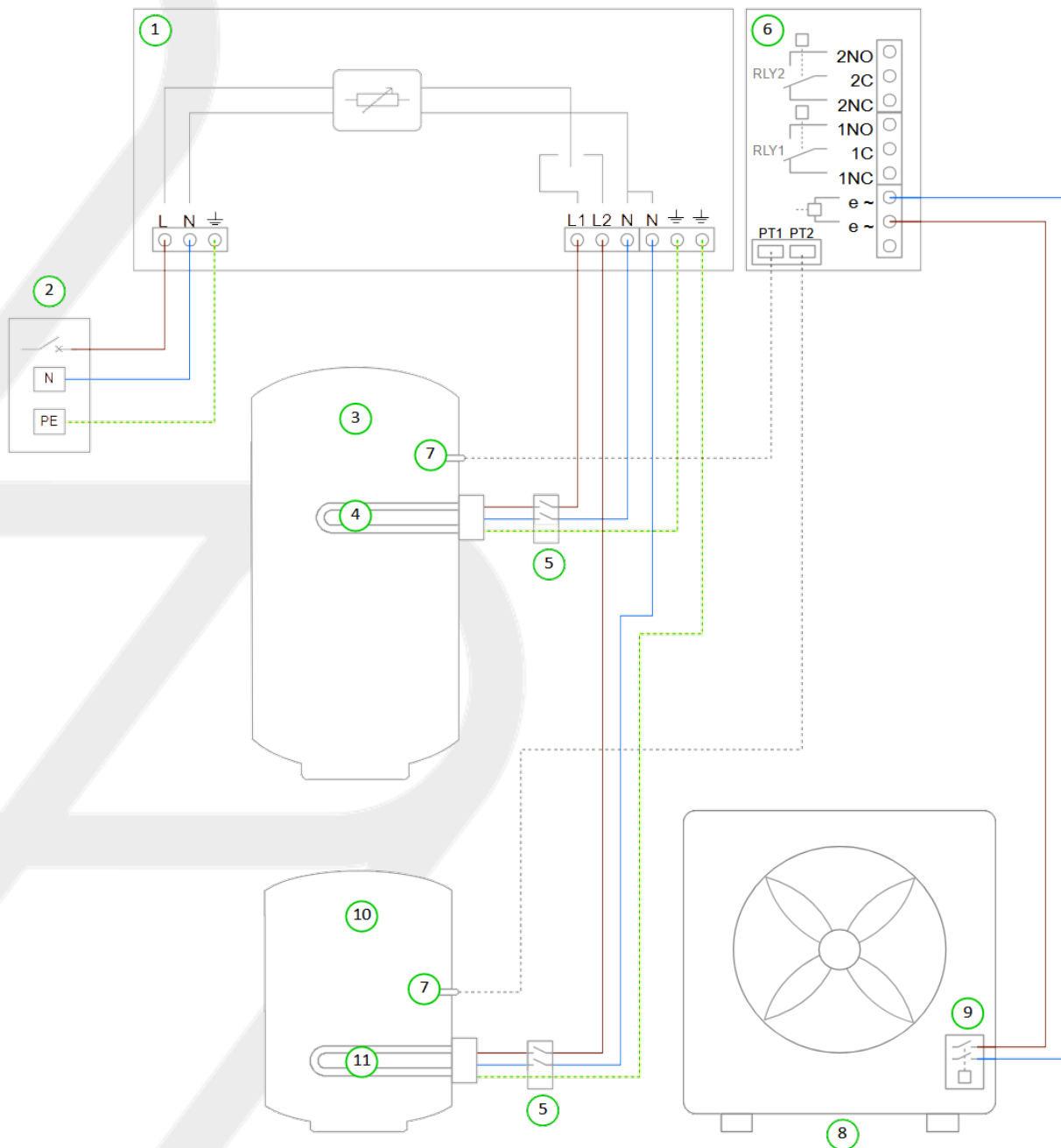
Installation of the temperature probe (7) is optional; the immersion heaters' mechanical thermostat is used by eddi if water temperature reading is not required.

This is also applicable to other boiler control wiring schemes i.e. Y Plan

### 10.5.3 Settings Required

Menu Option					Settings
Main Menu	Settings...			Display...	Icons ...
					Heater 1:
					Top Immersion/Bottom Immersion
					Heater 2:
					Underfloor
	Heater Settings			Priority...	
	Device Settings	Advanced	Relays & Sensors	Temperatures...	
				eSense Input...	Boost...
					Heater 2

## 10.6 Heat Pump with Water Heating and Buffer Tank



### 10.6.1 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)

### 10.6.2 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.

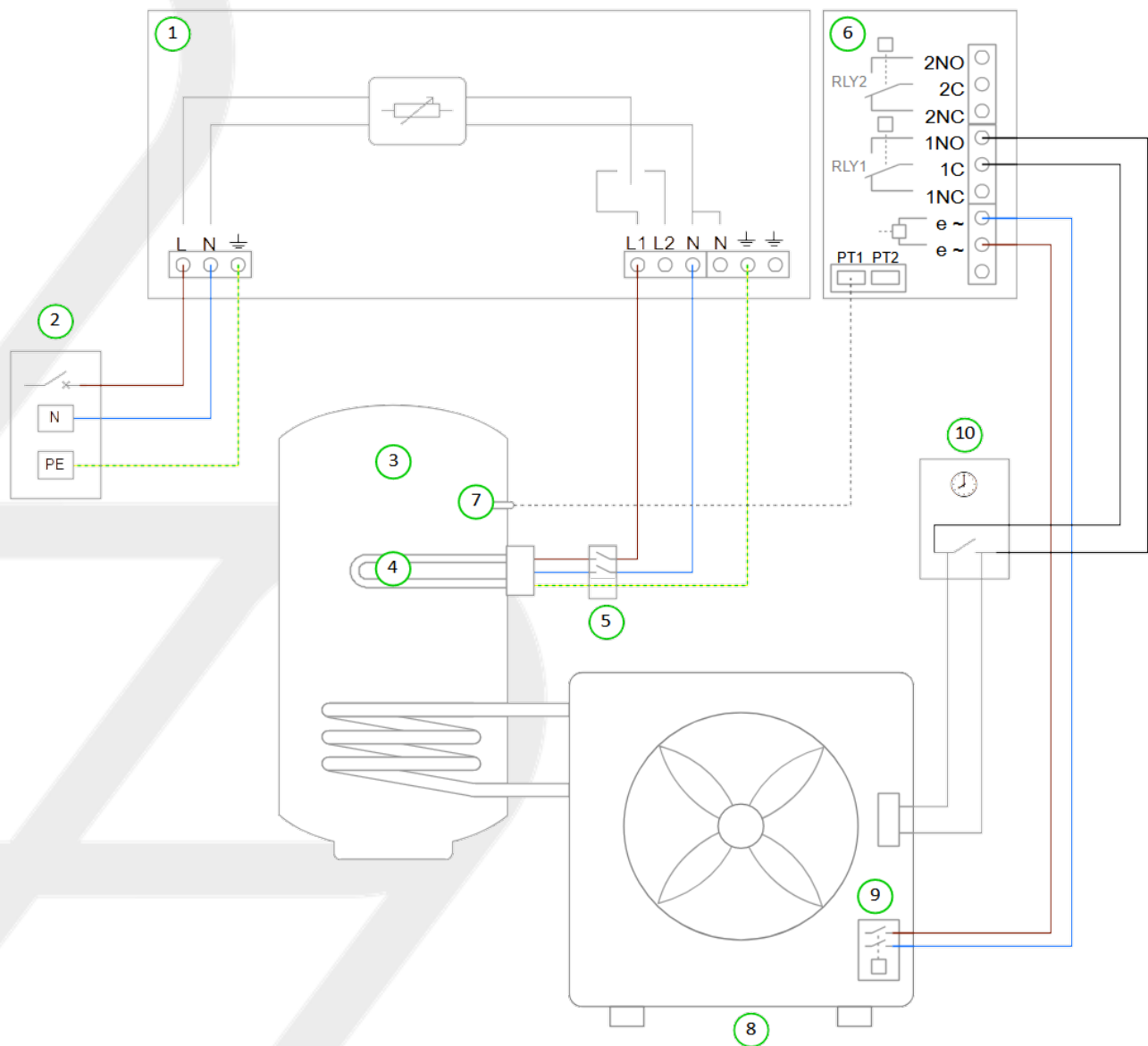
Most heat pumps require control of the immersion heater in the hot water cylinder, this is to periodically heat the water to a higher temperature in order to kill any Legionella bacteria that may have built up in the stored water. Remember it is not permissible to 'back-feed' the eddi device; a voltage 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.

### 10.6.3 Settings Required

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

## 10.7 Heat Pump with Water Heating and Priority Control



### 10.7.1 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

### 10.7.2 Functional Description

In this application the water is heated by eDDi with the immersion heater when there is a relatively 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).

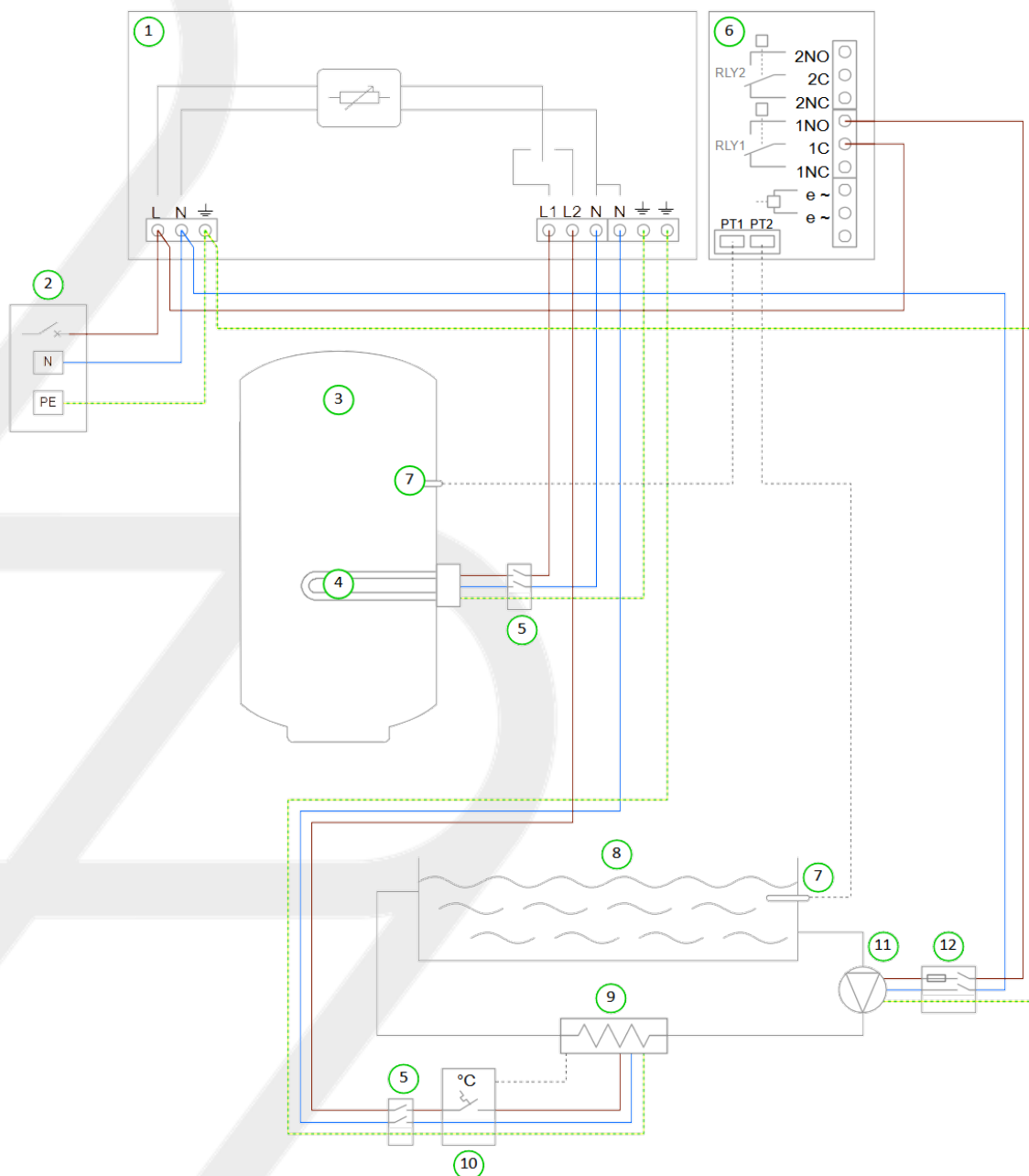
Most heat pumps require control of the immersion heater in the hot water cylinder, this is to periodically heat the water to a higher temperature in order to kill any Legionella bacteria that may have built up in the stored water. Remember it is not permissible to 'back-feed' the eDDi device; a voltage 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.

### 10.7.3 Settings Required

Menu Option					Settings		
Main Menu	Settings...			Display...	Icons...	Heater 1:	Top Immersion
						Heater 2:	None
	Heater Settings			Priority...			Heater 1
	Device Settings	Advanced	Relays & Sensors	Temperatures...		PT1 Set Point:	Set Temperatures as required if using temperature probes
				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	

## 10.8 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



### 10.8.1 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.

### 10.8.2 Settings Required

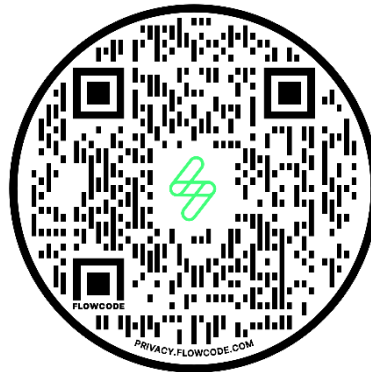
Menu Option					Settings
Main Menu	Settings...			Display...	Icons...
				Heater 1:	Top Immersion/Bottom Immersion
				Heater 2:	Pool
	Heater Settings			Priority...	
	Device Settings	Advanced	Relays & Sensors	Temperatures...	
				Relay 1...	Heating
					Heater 1

## 11 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. Refer to clearances section.
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 <i>Grid CT</i> section 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 resistance between L1 and N and between L2 and N at the HEATER terminals; the resistance should be between about 15 $\Omega$ and 350 $\Omega$ . Note: Around 18-20 $\Omega$ is normal for an immersion heater.

## 12 Technical Support

If you experience any issues with your eddi during or post installation, please contact our technical support team by scanning the QR Code below.



<https://myenergi.com/manual-support/>

Please contact us directly for the quickest solution.

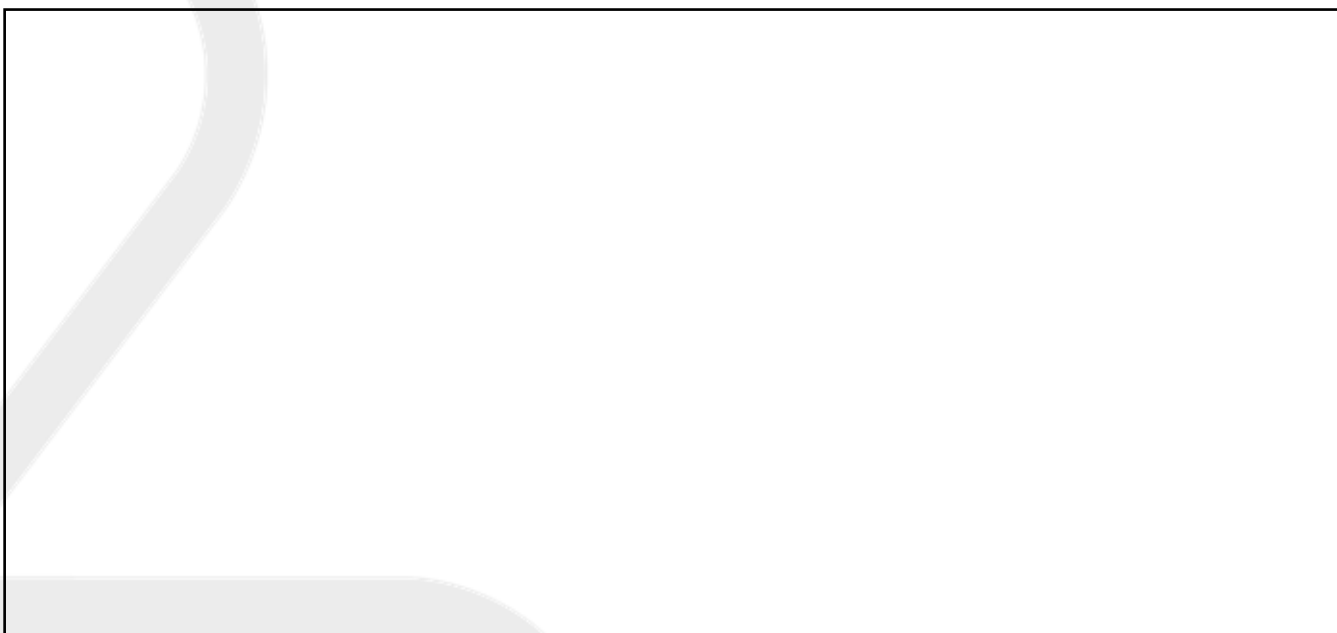
## 13 Declaration of Conformity

Hereby, myenergi declares that the radio equipment type eddi microgeneration energy diverter is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available by scanning the QR code below.



This is your unique product identification.



myenergi

Designed and manufactured in the UK by  
myenergi Ltd, Pioneer Business Park, Faraday way,  
Stallingborough, Grimsby, DN41 8FF

T: +44 (0)333 300 1303  
E: [sales@myenergi.com](mailto:sales@myenergi.com)  
W: [myenergi.com](http://myenergi.com)