POWERFLOW

Important Information for your PowerFlow:
FAZE **THREE 9kW**

- **Installation and User Manual**

IMPORTANT SAFETY INFORMATION, PLEASE READ AND UNDERSTAND THIS MANUAL BEFORE COMMENCING WORK

F-POINT technology®

Thank you for choosing PowerFlow

PowerFlow's Mission is to continually develop efficient energy storage technologies in order to increase the availability of low carbon generated power. This will contribute to CO2 reduction and help to protect our planet for future generations, something PowerFlow are very passionate about.

Decades of combined experience has been deeply integrated into your PowerFlow product.
From its class leading efficiency, to the highest of safety standards, the design of every component has been carefully considered to ensure long lasting reliable operation. All of our products are fully designed and 100% manufactured in the UK at our factory in Herefordshire, helping to support Great British manufacturing.

Ian Murray

Ian Murray: Founder & CEO.

Register Your Product.

Don't forget to register your product on the PowerFlow website. This will extend your FAZE THREE's 3 year standard warranty for an additional 2 years absolutely free.

Visit: www.powerflowenergy.com/warrantyregistration

Contact Us

If you have any questions about our products, our website is designed to provide support. Should you not find what you are looking for, you can contact us using the details below.

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Made in England

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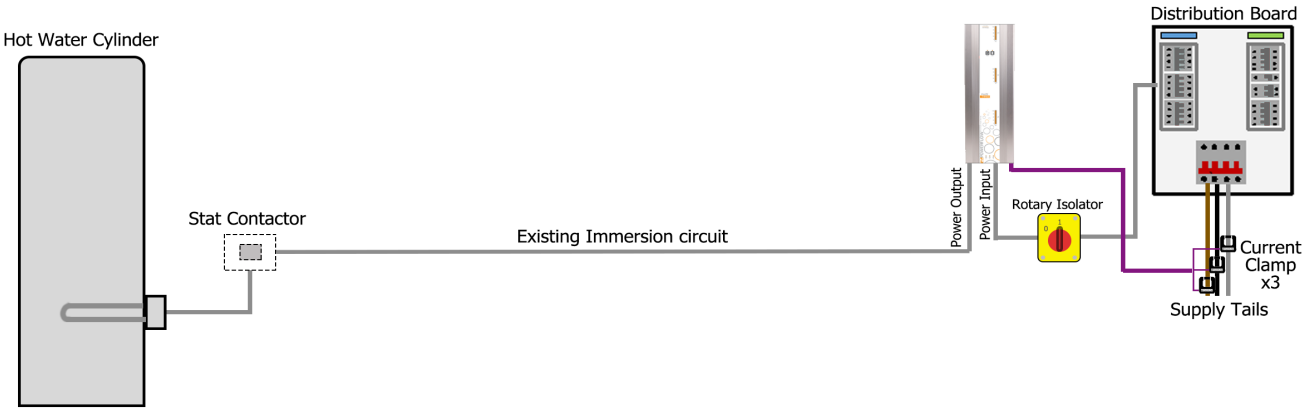
1. Quick Installation Guide

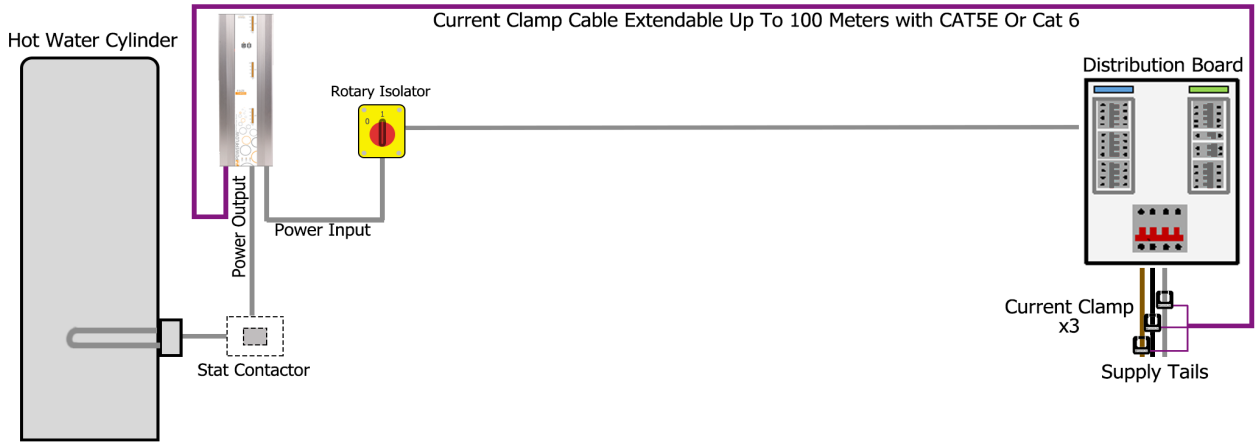
1.1 Installation Next To The Distribution Board:

When the immersion heater operates on a dedicated circuit, it is advisable to install the FAZE THREE device adjacent to the distribution board. This location is recommended as it means the AC supply cable and current clamps cable run can be short, making for a more straightforward and faster installation.



1.2 Installation Next to the Water Cylinder or Load:

If the immersion heater shares its circuit with other devices, the FAZE unit must be positioned near the resistive load element as it's output MUST only be connect directly to the resistive heating element only. Failure to follow this guidance may damage the FAZE THREE unit or other equipment connected to the same circuit, and will void any warranty. As a result, this setup requires the current clamp signal cables to be run back to the incoming distribution board. Should the distance exceed 5 meters, the current clamp cable can be extended using either Cat 5e or Cat 6 cable to a maximum length of 300 meters. (Note: long CT cable runs may be possible but have not been tested)



1.3 Installation Steps 1, 2 and 3

1.

Unboxing:

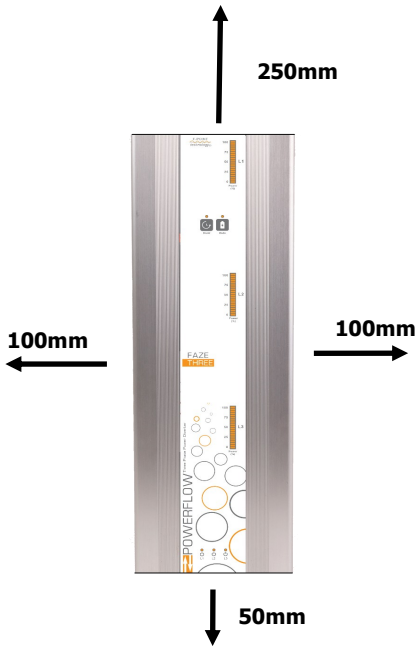
First set aside the accessories box, which contains the mounting kit, pre-wired current clamps (3). Then, from beneath the bottom insert, retrieve the power input / power output cables and the isolator.

2.

Isolator Installation:

Install the 32A rotary 4 pole AC isolator and connect the pre-wired 'Power In' cable to the isolator's load side.

3.



Mounting FAZE THREE:

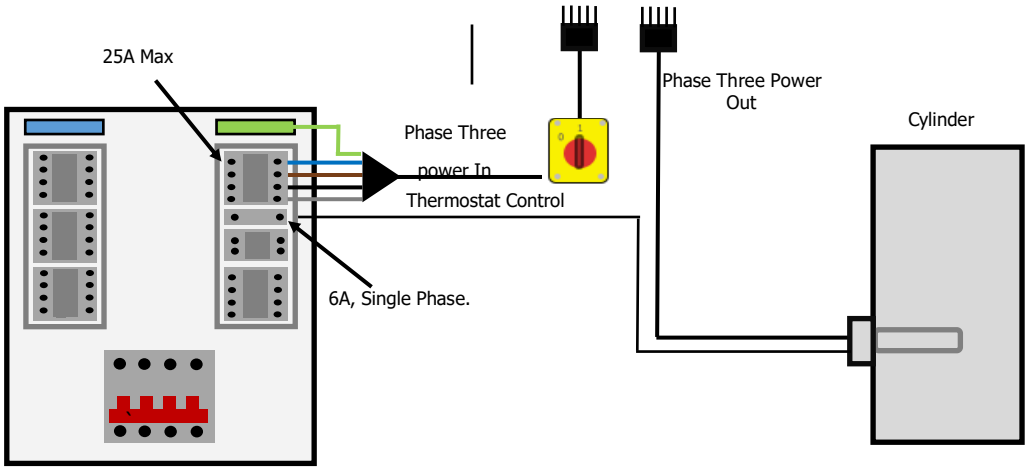
Secure FAZE THREE to a vertical wall using the provided self-tapping screws and rawl plugs, ensuring there is sufficient space around the device for airflow as shown in the diagram. Ensure the FAZE's IP20 rating is considered when choosing a mounting location.

1.4 Installation Steps 4 and 5

4. **Input Connection Wiring:**

1: Terminate a 2.5mm, 5 core flex cable from a 25A 4 pole 30mA type A RCCB to the supplied 32A AC isolator. Neutral **(Blue),** Earth **(Green / Yellow),** L1 **(Brown),** L2 **(Black),** L3 **(Grey).**

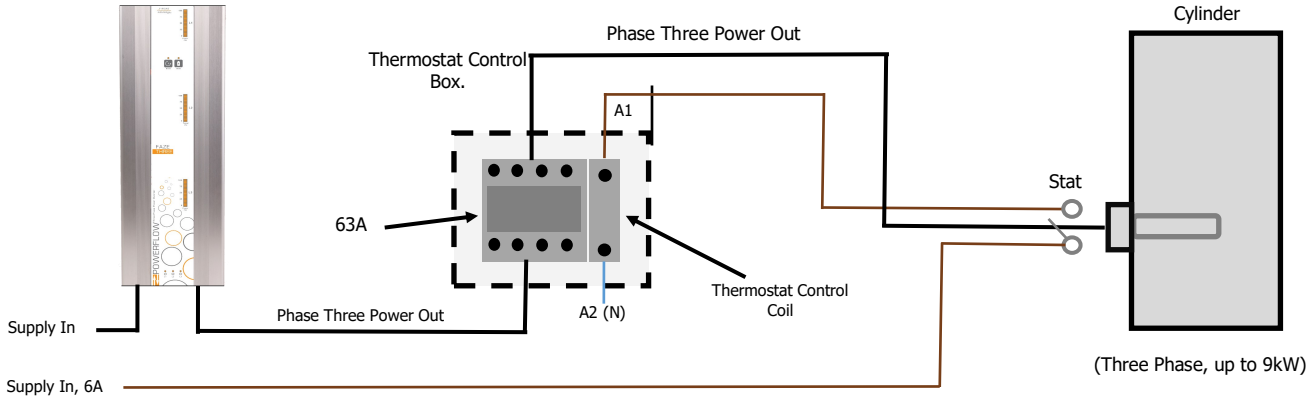
2: Plug the pre-wired connector into FAZE THREE then terminate the unwired end into the load side of the isolator. Following the same cable colour codes.



5. **Output Connection Wiring:**

1: Plug the pre-wired power output cable into FAZE THREE. Terminate the unwired end into the 63A contactor in the thermostat control box. Neutral **(Blue),** Earth **(Green / Yellow),** L1 **(Brown),** L2 **(Black),** L3 **(Grey).**

2: Terminate a 2.5mm, 5 core flex cable from the load side of the 63A contactor to the immersion element. Using the same colour codes as step 1.



1.5 Installation Step 6

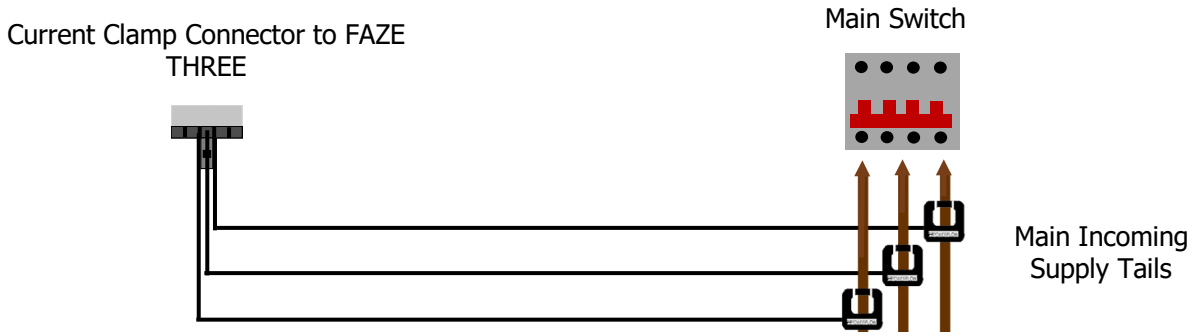
6.

Current Clamp Installation:

1: Clip the current clamps around the main incoming supply tail. Ensuring the clamp is fitted the specified way around. Observe the label on the CT for the correct fitment.

2: Clip the current clamp connector into FAZE.

Note: the current clamp connector is pre-wired with 5 meters of twisted pair cable. This is extendable up to 100 meters with Cat 5e or Cat 6 cable.

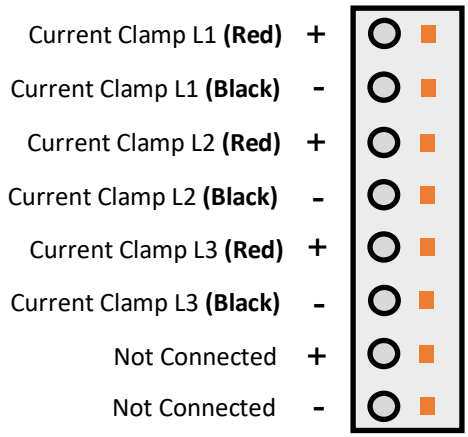


Current Clamp Connection Wiring

L1 Current Clamp: Terminate the **red wire** to the **L1+** terminal. Connect the **black wire** to the **L1-** terminal.

L2 Current Clamp: Terminate the **red wire** to the **L2+** terminal. Connect the **black wire** to the **L2-** terminal.

L3 Current Clamp: Terminate the **red wire** to the **L3+** terminal. Connect the **black wire** to the **L3-** terminal.



IMPORTANT:

- It is essential the only connections to the FAZE THREE circuit are resistive heating elements.
- It is the installers responsibility to protect against legionnaires by boosting the water temperature over 60ºC once every 15 days minimum. This can be achieved with an external timer to override the FAZE or by using the addition control box, sold separately.
- Ensure that the current clamps are fitted the correct way around. Failure to observe this will result in incorrect operation which may result in energy import. PowerFlow will not be responsible for any costs incurred by incorrect installation.
- Check all connections are secure and comply with IET BS7671 wiring regulations.

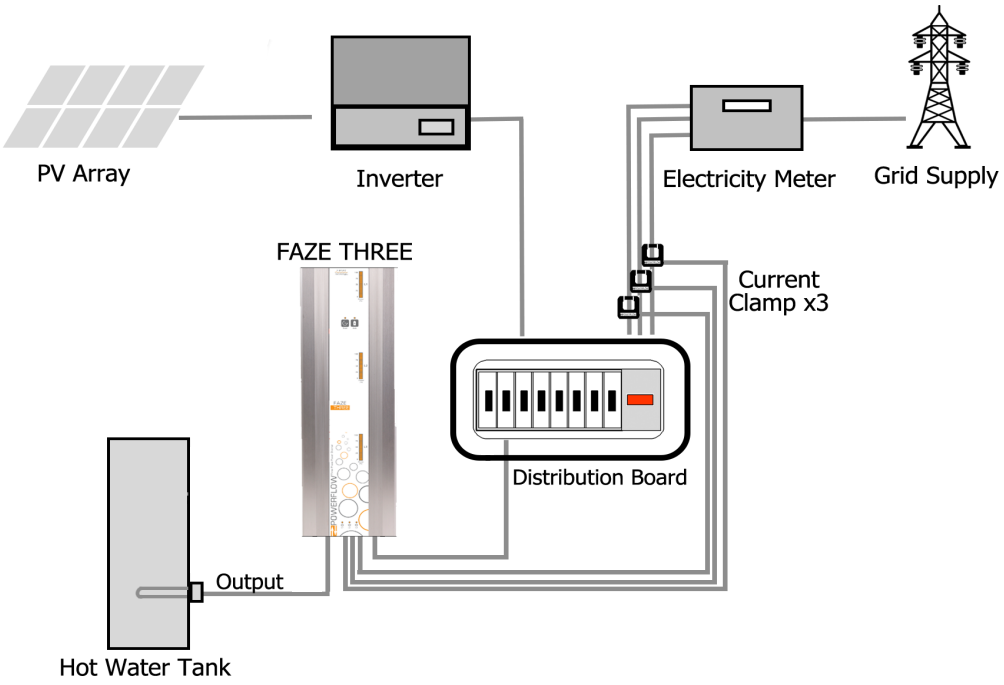
2. Product Description

PowerFlow FAZE THREE is a grid connected energy diversion system which converts surplus AC electrical energy, or export, from any 3 phase grid connected solar or wind generator into heat via a hot water or space heating resistive load element. By performing this function, surplus energy generation, which is unable to be used, can be stored and used at a later time when demand for hot water or heating is required. This results in less energy consumption and in turn leads to cost savings.

FAZE THREE is completely independent from the solar or wind generator other than it uses a current measurement device or CT to calculate in which direction energy is flowing in each phase, and how much energy is available for storage. FAZE THREE performs energy capture purely based on this measurement alone. This enables FAZE THREE to work during any time of the day and, together with the solar or wind generator, to ensure that maximum energy capture is possible.

During times when export occurs, the amount of energy available continually changes due to changes in generation and changes in building demand. FAZE THREE automatically measures energy flow every 200 milliseconds to match export levels ensuring that only surplus energy is sent to the heating load.

2.1 Typical System Layout



3. Introductory Information

3.1 Validity

Read fully and understand this manual before commencing work

This manual is for electrically skilled persons. The tasks described in this manual may be performed by electrically skilled persons only. It describes the installation, commissioning, maintenance and warranty procedures for FAZE THREE.

3.2 Additional Information

You can find additional information on the design of the complete Energy Recovery System at www.powerflowenergy.com. For electrical design information such as MCB, RCD and cable sizing, please reference BS7671.

3.3 Country Grid Parameters

Using FAZE THREE Inside and Outside the UK

- FAZE THREE is designed to be connected to an AC supply network with a nominal supply of 230V / 50Hz.
- FAZE THREE does not connect directly to the generation system and therefore will not effect its operation or any tariff rate that may be associated with it. In addition, it does not effect the grid connection standard associated with the generation equipment.
- FAZE THREE can be used outside of the UK provided it is connected to the above stated network and the supply standard complies with any other local electrical standards required for connection.
- If FAZE THREE is connected to a supply network which is outside of its scope of operation it will cause irrefutable damage to the device and will not be covered by any factory warranty. It is important to ensure that the supply voltage and frequency are suitable before connection.

3.4 Product Identification and Serial Number

The serial number is located in three places:

- On the side of your unit.
- On the outer packaging box.
- On the included warranty registration card.

The serial number is used to track and activate your extended warranty. To register your FAZE THREE visit: www.powerflowenergy.com/warrantyregistration

4. Safety Information

4.1 Appropriate Usage

PowerFlow FAZE THREE is a grid connected energy diverter designed solely to be used together with any grid connected solar PV or wind generation system. It cannot be used in battery back up, or off grid systems. During back up operation, the FAZE THREE device must be disconnected.

Do not use FAZE THREE for any other purpose other than described in this manual. Alternative uses or modifications to the product are expressly NOT permitted. Any other use will void any warranty claims and operation permissions.

4.2 Safety Instructions

The following terms will be used throughout this manual. Please observe the safety instructions.

DANGER: Danger to life due to high voltages.

- All work detailed by this instruction MUST be carried out by an electrical professional.
- Children may not play with or have access to FAZE THREE

WARNING: Risk of injury, illness or damage to property.

- All work detailed by this instruction should be carefully considered.

IMPORTANT: Recommendations or advice that aren't followed correctly may cause installation or system problems and may result in additional product support or damage.

4.3 IMPORTANT: Safety and Legionella Advice

DANGER

WARNING: Please take note of the following:

1. **DO NOT place objects over the enclosure.**

   PowerFlow FAZE THREE uses the metal enclosure to dissipate heat. Covering the enclosure may cause product failure. Please ensure adequate ventilation is provided. For further information refer to the installation guide.

2. **DO NOT disassemble the unit at any time.**

   PowerFlow FACE THREE contains live parts inside, never disassemble the system.

Important: Legionella Advice

Legionella is a bacteria that can grow in water below 60ºC. It is common practice for hot water and heating systems to raise the water temperature over 60ºC in order to kill any bacteria growth.

Due to the very nature of the technology it is possible during periods of low energy export to partially heat the water. In systems without a second heating source such as a boiler to 'top up' the water temperature, it is possible that unused warm water could remain in a temperature range where bacteria can grow. Because the particulars of each installation are different, PowerFlow Energy cannot take responsibility for controlling the risk of legionella. It is the installers responsibility to ensure that this risk is controlled. Adequate water exchange and/or additional heating must be supplied in order to raise the water temperature above 60ºC on a minimum of once every 15 days. This can be achieved in all electric homes by using the external timer function to override the FAZE THREE system. Further advice on Legionella can be found at www.hse.gov.uk/legionnaires

5. Unpacking

5.1 Scope of Delivery

Please check the delivery for completeness and for any visible external damage. Contact your supplier if anything is damaged or missing. Ensure that the Product Identification Documentation is retained.

The following components should be included:

5.2 Box Contents

FAZE THREE

3x Current Measurement Clamp

Power Output Connector

Power Input Connector

Current Clamp Connector

32A AC Isolator

Wall Fixing Set

User Manual

Object	Quantity	Description
A	1	FAZE THREE Device with integral mounting brackets
B	3	Current measurement clamp (CT)
C	1	3 PIN IEC Male power OUT connector
D	1	3 PIN IEC Female power IN connector
E	1	Current clamp connector
F	1	32A AC Isolator
G	1	M6 wall fixing set
H	1	Installation and User Manual.

6. System Design

It is important to take note of the following notices. Failure to do so may result in danger to persons,

damage to property, or invalidation of the device warranty. All electrical work referenced in this section should be carried out by an electrical professional.

Take note of the following warnings:

DANGER: Risk of electric shock

PowerFlow FAZE THREE is designed to be fully integrated and simple to install. It is recommended however, that all electrical work is carried out by a competent electrical professional and all local electrical standards such as BS7671 are observed prior to installation.

DANGER: FAZE THREE has an aluminium enclosure and is considered to be an exposed conductive part. There MUST be an earth connection terminated at all times.

Ensure an earth continuity check between the PE supply and the case has been carried out prior to commissioning.

WARNING: Risk of damage to the Device

FAZE THREE **MUST NOT** be installed in conjunction with Voltage Optimization or power factor correction equipment. Doing so may damage the device. Failure to ensure that no voltage or power factor correction devices of any type are installed on the premises prior to installation will result in the warranty being void. For further information, please refer to the warranty documentation.

6.1 AC Circuit Protection Design

The FAZE THREE device contains a single output connection, capable of outputting modulated power levels to a connected resistive load of up to 3000W

During operation it is possible for FAZE THREE to pull a load current of up to 20 Amps, therefore the supply circuit must be suitably designed to cope with this level of load current.

A maximum value of a 25A type C MCB should be observed for overcurrent and short circuit protection in this instance with a minimum supply conduction size of 2.5mm².

Recommended AC connection method

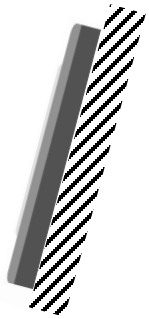
Connection method:	A New Final Circuit is used to supply FAZE THREE
Cable Size:	2.5mm² Minimum. (longer cable runs will require a cable calculation to mitigate voltage drop)
Maximum MCB Size:	25A Type C
Protection and isolation method:	30mA RCD protection should be provided.

7. Selecting a Suitable Mounting Location

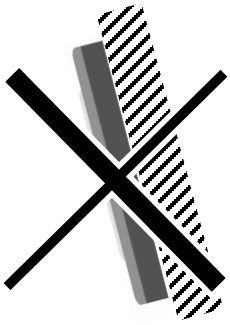
IMPORTANT: FAZE THREE is rated to IP20. It is suitable for indoor installations only. It's also suitable for damper environments such as un-heated garages or out buildings.

- The mounting method and location must be suitable for FAZE THREE's weight and dimensions. It has been designed for wall mounting only in a near vertical orientation. Ensure suitable ventilation.
- The mounting location must at all times be clear and safely accessible without the use of additional equipment such as scaffolding or lifting platforms.
- It is strongly recommended NOT to install FAZE THREE in loft spaces or direct sunlight due to increased heat during summer months.

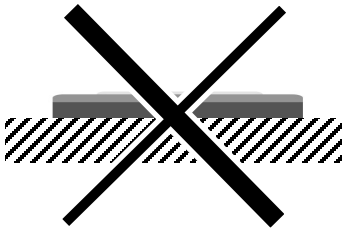
Vertical Mounting



Titled backwards no more than 15°



Never mount with a forward tilt

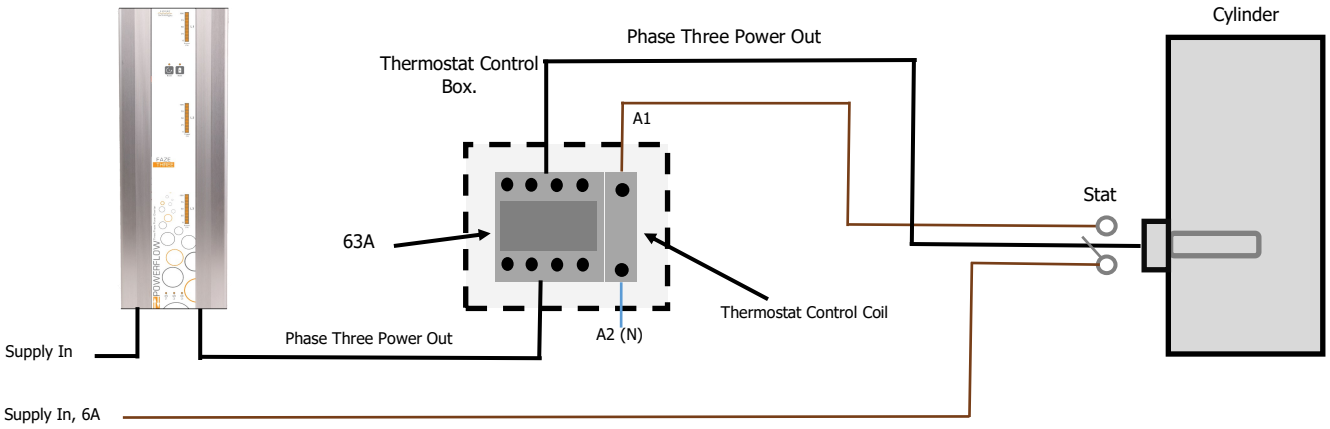


Never mount Horizontally

7.1 Ventilation and Mounting Clearances

Observe the minimum clearance to walls and other devices. This is to ensure that there is sufficient and suitable space for heat dissipation.

8. Output Connection Wiring Diagram

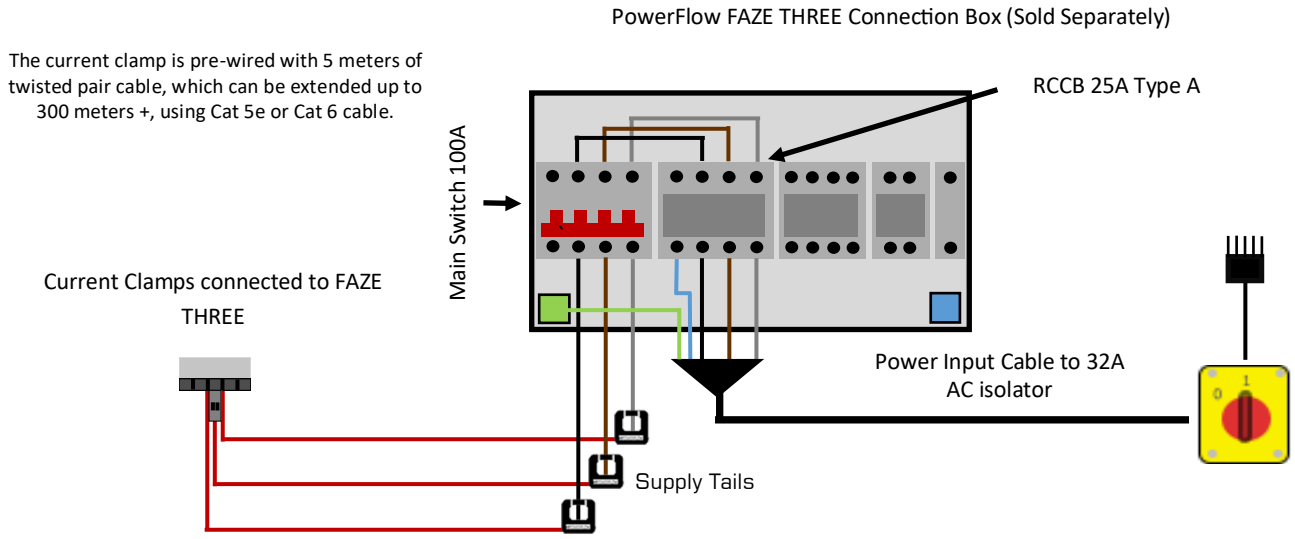


IMPORTANT

1: Plug the pre-wired power output cable into FAZE THREE. Terminate the unwired end into the 63A contactor in the thermostat control box. Neutral **(Blue),** Earth **(Green / Yellow),** L1 **(Brown),** L2 **(Black),** L3 **(Grey).**

2: Terminate a 2.5mm, 5 core flex cable from the load side of the 63A contactor to the immersion element. Using the same colour codes as step 4.

9. Input Connection Wiring Diagram



1. Terminate the Incoming Supply to the RCCB:
Connect the incoming supply lines L1, L2, L3 to the 4 pole RCCB (Residual Current Circuit Breaker) rated at 25A / 30mA Type A. Ensure all connections are secure and properly insulated.

2. Install the Isolator:
Mount the 32A rotary 4-pole AC isolator in an accessible location.

3. Connect the RCCB Output to the Isolator:
Connect the output terminals of the RCCB as follows:

- L1 (Brown)
- L2 (Black)
- L3 (Grey)
- Neutral (Blue)
- (PE should be connected to the earthing bus bar within the distribution panel.)

4. Connect the Isolator to FAZE THREE:
Plug the pre-wired end of the power input cable into FAZE THREE and terminate the unwired end into the isolator, following the colour codes specified in Step 3.

5. Connect the current clamps:
Clip one current clamp around each supply tail. Plug the Pre-Wired connector into FAZE THREE.

NOTE: It is essential that no other loads or electrical connections, other than resistive loads, are connected to the FAZE-driven circuit. Failure to observe this may result in damage.

10 LED Display Overview

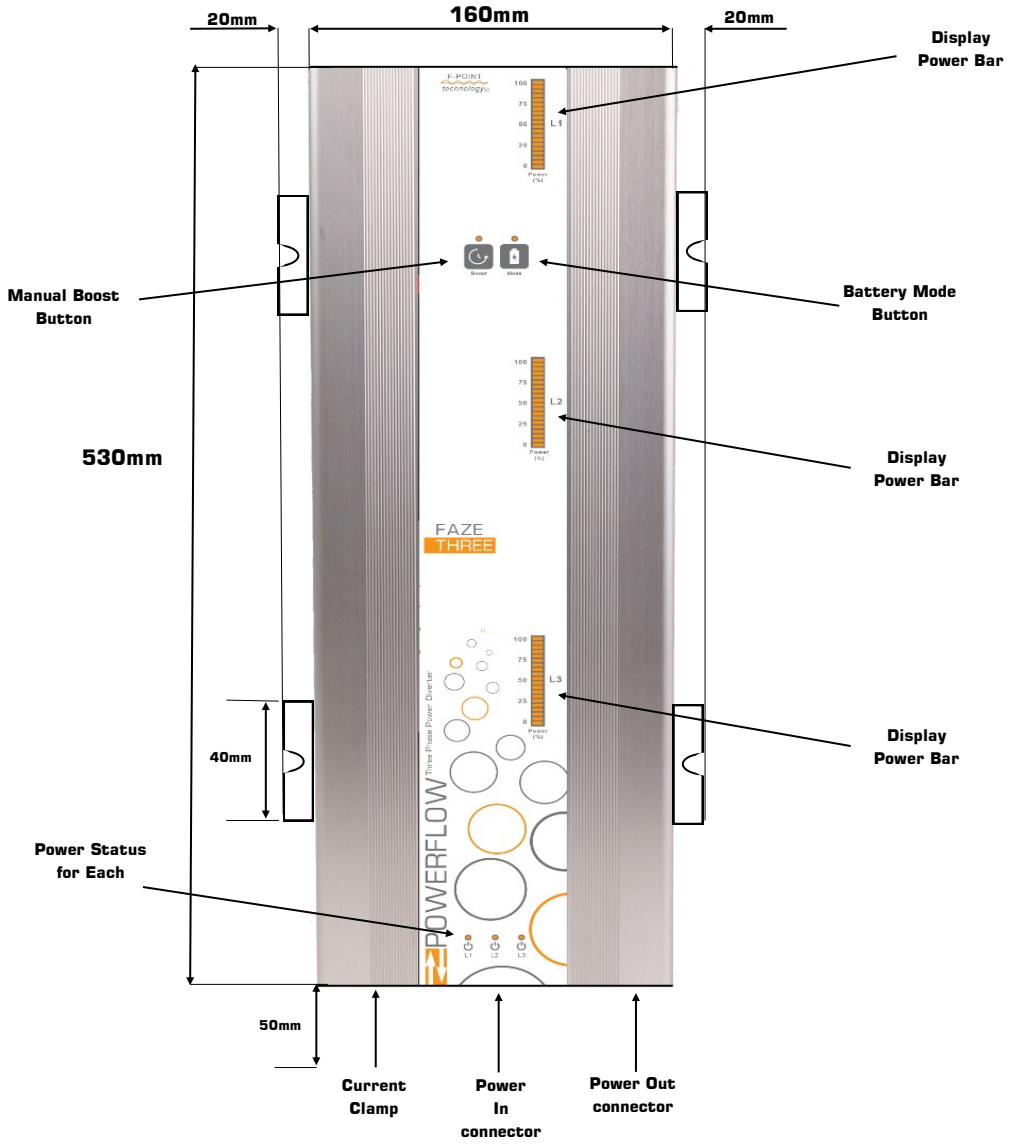
LED Status	Explanation
	**No Load -** If the FAZE attempts to drive a heating load that has been switched off, either manually or by a thermostat.
	**No Export -** Indicates that no energy is being diverted
	**Live Energy Diversion -** The power bar shows the live export power being diverted to the load. Each LED represents 5%.
	**Over Temperature -** Indicates that FAZE THREE is internal over temperature. Once the two centre LED's are illuminated, FAZE THREE will turn the immersion output OFF for 5 minutes to allow cooling. After 5 minutes, FAZE THREE will automatically continue operation.
	**Power On -** Indicates that voltage is present on each phase. The LED will flash 5 times during start up. The power indicators will stay illuminated if FAZE THREE is powered on.
	**Manual Boost On -** Indicates the boost button has been pressed, FAZE THREE will run on full power regardless of export for 90 minutes.
	**Battery Mode On -** Indicates battery mode has been turned on, FAZE THREE will allow the battery to have priority of export energy by slowing supply measurements down to longer than the battery.

10.1 Control Buttons

Manual Boost - The manual boost button is designed to enable the user to provide supplementary power to the heating load should it be required. To enable the manual boost, push the button once, an audible 'click' can be heard and the LED will turn on indicating the manual boost has been started. At the end of the timed period, the manual boost will automatically stop, the LED will turn off and FAZE will revert to normal operation. During the timed operation, with the LED illuminated, the timed period can be manually stopped by pressing the button once. Take note that during manual boost operation FAZE will supply the load with 100% power irrespective of export levels. If no generation is occurring this will result in importing energy during the timed period.

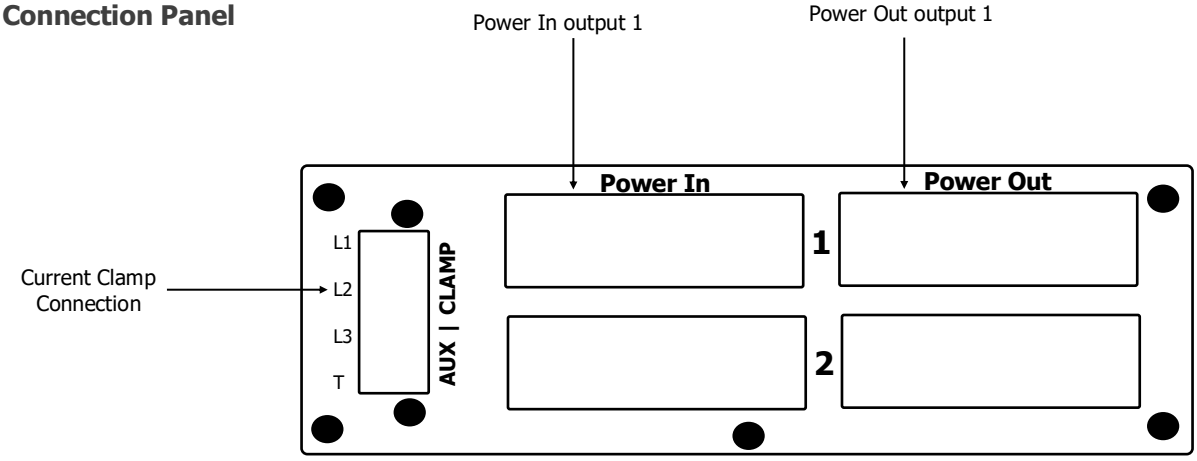
Battery Mode - When designing a multi technology renewable energy system, each storage medium must have differing priority settings. This is the speed that the device measures export energy. FAZE THREE has hyper-fast reaction speed as default. This results in priority being given to the FAZE over, for example a battery storage system. In order to give the battery storage system priority we slow down the FAZE's export measurement speed to be slower than the battery. When the battery mode is on the LED will illuminate and the measurement speed will be slowed down to 10 seconds, giving other devices priority of export energy.

11 Electrical Connections Overview



Note: Power Connectors are pre-wired with 5 meters of 5 core flex 2.5mm²

11.1 Connection Panel



12. Commissioning

12.1 Commissioning FAZE THREE

Before switching on for the first time, check that the following has been completed.

1. Mounted to a secure surface, the correct way up and with adequate ventilation.
2. All cable runs are correctly fixed and supported.
3. Ensure all the terminations inside the consumer unit are correct and the terminals have been tightened.
4. Ensure earth continuity between the earthing bar inside the consumer unit and one of the cover fixing screws on the device.
5. Carry out all circuit tests in accordance with BS7671.
6. Ensure the current clamps are securely clamped around the incoming live supply conductor in the correct location.
7. Check the orientation of the current clamps to ensure the label faces the incoming supply and that it is installed between the main meter position and the main consumer board.
8. Ensure any safety labelling has been securely fitted in the correct locations.
9. Ensure the customer has been issued with a user manual and has been given an overview of how their system works and how to use it.

Only once all of the above has been completed should the system be energised.

12.3 Adjusting the existing heating system

IMPORTANT: For use with immersion heaters where hot water is currently heated by;

Gas or Oil boilers or heat pumps:

To maximise savings, it is advised to re-time the boiler's domestic hot water timer to come on after sunset to allow FAZE THREE to heat or pre-heat the hot water. This will allow maximum energy capture and lead to maximum savings.

13. Trouble shooting

Below is a sample of the most commonly asked question's from our support line.

If you can't find the answers to your questions in this manual, then for further information please visit **www.powerflowenergy.com** or you can also send us an email via our website at **www.powerflowenergy.com/contact-us**

Why does FAZE THREE not power ON?

- Check all AC connections are terminated correctly.
- Check that all MCB's, fuses are in place.
- Check all isolators are in the ON position.

If all of the above have been verified, please contact your supplier for further support in the first instance.

My FAZE THREE device seems to be running even when there's no export?

FAZE THREE is receiving incorrect data from the connected current clamps (CT).

- Ensure that the current clamps are orientated the correct way round. Please refer to the label on the current clamps.
- Ensure that the current clamps are connected around the main incoming live supply tail between the main consumer distribution board and the main incoming electricity meter.

The LED bar shows load OFF all the time?

This is normal if the heating load has reached temperature and switched off on its own thermostat.

When FAZE THREE operates it is able to detect if the heating load is connected or not. If FAZE THREE is continually displaying LOAD OFF when export is available, then it is likely the load is not connected.

- Check that the immersion switch is turned on
- Many modern immersion heating elements contain a thermal cut out switch which often looks like a small disc. This needs to be pushed inwards. It will be located on the immersion heating device.

DANGER: Ensure the power is supply is isolated before removing any covers.

When I put a volt meter on the immersion terminals during when FAZE THREE is outputting power I see large voltage fluctuations?

This is completely normal. FAZE THREE operates by controlling the AC sign wave. Standard

Multi Meters are unable to detect this control method due to it's speed. This is why you see a lower average voltage reading which is constantly changing.

14. Warranty Information

POWERFLOW Factory Warranty: FAZE THREE

Applies solely to **FAZE THREE** The statutory warranty obligation of the seller of your device is not affected by this warranty and remains fully valid for 36 months from the date of purchase. You receive a POWERFLOW extended factory warranty above the statutory 36 months period valid only if the following conditions are met:

If the device is registered on the POWERFLOW website at: www.powerflowenergy.com/warrantyregistration it will benefit from a 5 year warranty period from the date of purchase, or 10,000kWh of recovered energy operation (as recorded by the total kWh counter on the FAZE device). The total kWh limit is only applicable for installations with renewable generators greater than 10kW peak. This is inclusive of but does not affect the statutory warranty obligation of 36 months.

The POWERFLOW factory warranty covers any costs for repair or spare parts during the agreed period beginning on the date of purchase of the device, subject to the following warranty conditions. This is not associated with a durability warranty.

14.1 Warranty Conditions

If a device becomes defective during the first six months of operation from date of purchase, the device will be replaced with a new equivalent product. Defects arising after the first six months will be covered under the POWERFLOW manufacturer warranty period and, unless this should be impossible or disproportionate, one of the following options will be selected at the discretion of POWERFLOW:

- Device repair at POWERFLOW, or
- Device repair on-site, or
- Exchange for a replacement device of equivalent value with regard to model and age.

In the latter case, the remainder of the warranty entitlement will be transferred to the replacement device and your entitlement will be documented at POWERFLOW. The term "disproportionate" as referred to above applies in particular if, as a result of the envisaged measures, POWERFLOW were to incur costs deemed unreasonable according to the following criteria:

- In view of the value that the device would have without the defect,
- Taking into account the significance of the defect, and
- After consideration of alternative workaround possibilities that POWERFLOW customers could revert to without significant inconvenience.

The factory warranty includes the costs of POWERFLOW for work and material for the restoration of faultless functioning in POWERFLOW's factory or for on-site repair work by POWERFLOW service personnel. All other costs, particularly shipping costs, travel and accommodation costs of POWERFLOW's personnel for on-site repairs as well as costs of the customer's own employees are NOT included in the factory warranty.

To determine the warranty entitlement, it will be necessary to email POWERFLOW at info@powerflowenergy.co.uk. If the defective device was installed by a PowerFlow accredited installer, it will be necessary to contact them in the first instance. The type label on the device must be completely legible. Otherwise, POWERFLOW is entitled to refuse warranty services.

Defective devices with a detailed error description and proof of purchase will need to be sent to the POWERFLOW factory for fault diagnosis. If no error is found with the device, you will NOT be charged and the device will be returned to the sender. Shipping costs may be charged at the discretion of POWERFLOW. If we agree to a replacement, we generally send an equivalent replacement device, packaged appropriately for transport, within ten working days.

14.2 Scope of Factory Warranty

The factory warranty does not cover damage that has occurred due to any of the following reasons:

- Transport damage
- Incorrect installation or commissioning
- Failure to observe the user manual and/or the installation and technical manuals
- Modifications, changes or attempted repairs
- Incorrect use or inappropriate operation
- Insufficient ventilation of the device
- Failure to observe the applicable safety regulations and appropriate standards. (e.g: BS7671, etc.)
- Public or private network supply problems outside of tolerance limits of the statutory guidelines.
- Force Majeure (e.g: lightning strikes, storms, fire, flooding or water damage, etc.)

Neither does it cover cosmetic defects which do not influence the energy diversion.

Claims that go beyond the rights cited in the warranty conditions, in particular claims for compensation for direct or indirect damages arising from the defective device, for compensation for costs arising from disassembly and installation, or loss of profits are not covered by the manufacturer warranty, insofar PowerFlow Energy Ltd is not subject to statutory liability. In such cases, please contact the company that sold you the device. Possible claims in accordance with the law on product liability remain unaffected. POWERFLOW reserve the right to change the warranty conditions without notice. All claims arising from or in connection with this warranty are subject to UK law.

For further information, visit **www.powerflowenergy.com**

15. Technical Specification

Total Output Power	9kW / 12kW
Output power: Max / Nominal	9kW / 12KW
Maximum Output Current	20A Per Phase
Phase Operation	Three Phase
Voltage Range / Frequency	197V—270V / 50Hz
Compatible Generator Type	Solar PV / Wind / Hydro
Recommended renewable generator size (inverter AC output power)	2 x Maximum Load
Output Load	Resistive Only
Output Control Range	5% - 100%
Minimum export power level / Export tracking range	0w - 25w
Dimensions (without connectors) (L / W / H) mm	530 / 170 / 54
Weight	8kg
Noise Emissions	<10dBA
Self-consumption (night)	24mA
Degree of protection	IP20
Operating temperature range	-10 °C to +60 °C
Cooling concept	Convective Cooling
Efficiency	98%
Compliant Standards	CE / RoHs / BS EN: EMC / LVD
Maximum MCB Size	25A

EN Declaration of Conformity

The devices listed below have been developed, manufactured and/or tested according to the below mentioned EN directives.

- Electromagnetic Compatibility (EMC)
- Low Voltage Directive (LVD)
- General Electrical Safety Requirements

PRODUCT(s)	**FAZE THREE**
Electromagnetic Compatibility –3 (EMC) *	
BS EN 61000-3-2: 2006: Limitation for harmonic current emissions in public low-voltage supply systems.	X
BS EN 61000-3-3:2008: Limitation of voltage fluctuations and flicker in public low-voltage supply systems.	X
Electromagnetic Compatibility –4 (EMC)	
BS EN 61000-4-5:2011: Surge immunity tests.	X
BS EN 61000-4-11: 2004: Voltage dips, short interruptions and voltage variations immunity tests.	X
Low Voltage Directive & General Electrical Safety Requirements	
BS EN 60335-1:2012+A11:2014: Household similar electrical appliances. Safety, General Requirements.	X
BS EN 62109-1: 2010: Safety of power converters for use in photovoltaic power systems. General requirements.	X
EU Directives: 2006/95/EC, 2004/108/EC, CE, RoHs compliant	X
Device Operation	
F-POINT *technology®:* Measurement and reaction time of control system Verified in conjunction with the University of Gloucestershire	200-400ms

Information
Without written confirmation by Power Flow Energy, this declaration of conformity is no longer valid if:

- The product is modified, supplemented or changed in any other way
- Components, which are not part of the Power Flow accessories list are integrated into the product.
- The product has not been used for its intended use laid out by the product specifications.

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Managing Director

Dr Akbar Sheikh Akbari (PhD MSc BSc MIET)

POWERFLOW

www.powerflowenergy.com