PowerPlus Energy Cabinets

Installation and Operation Manual

Your complete installation guide for all PowerPlus Energy PIR, PEW and PEF Cabinets

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1. Introduction

The pre-wired cabinets from PowerPlus Energy minimise the time required to install batteries and PCE on-site.

Ranging from small battery enclosures to cabinets including gear trays, you can pre-build and test in the workshop, simplifying site installation.

PowerPlus Energy cabinets are designed and manufactured in Australia for the world's harshest conditions to be a crucial part of an overall simple, flexible and reliable energy storage solution.

2. Safety

Installers and users are responsible for familiarising themselves with this manual. These cabinets are designed to only integrate with PowerPlus Energy batteries.

While each PowerPlus Energy battery has a 2 pole non polarised K Curve circuit breaker, and some cabinets have an inbuilt adjustable 200A-250A ganged, non-polarised MCCB with battery take-off leads prewired and terminated, it is the responsibility of the systems integrator/installer to understand and comply with local, national and international standards as other regulations may apply.

Installation should be carried out by a suitably qualified and experienced person who can specify the correct cables, DC bus arrangement, external circuit protection, polarity checking and suitability of the design for the installation according to all necessary local, national and international standards and requirements within this manual.

2.1 BASIC SAFETY

The following precautions should be observed.

Cabinets:

- is intended to be at least a 2 person lift when moving or installing,
- should not be exposed to pressure, or have objects placed on top of them

The cabinets **should not** be:

- installed in direct sunlight, rain or saline environments
- exposed to strong impacts
- Battery connectors should not touch conductive surfaces unless intended to do so

The batteries within **should be**:

- kept dry at all times
- kept away from insects or animals

2.2 TRANSPORTATION

PowerPlus Energy's cabinets can be large and heavy and should be shipped in the original manufacturer's packaging and secured to a pallet. Cabinets should not be top loaded and care afforded to ensure no damage occurs from fasteners.

All cabinets from PowerPlus Energy are designed to be transported empty of batteries and heavy PCE.

2.3 STORAGE OF CABINET

The cabinet **should be**:

- stored either on the pallet it was shipped with locking devices in place or stacked vertically with care taken to secure without damaging cabinet
- kept in a dry environment away from moisture
- stored away from incompatible substances

2.4 DAMAGED CABINET

A damaged cabinet should not be used and should be returned to PowerPlus Energy or disposed of via a recycling facility.

2.5 QUALIFIED PERSON (INSTALLER)

This operation manual and task sets within regarding installation should be carried our by a suitable qualified and skilled person.

The installer needs to be a person with adequate skills, qualifications and experience.

They **should**:

- Have a thorough understanding of operations, design and installation principles of battery energy storage systems.
- Have a thorough understanding of all dangers and risks associated with installing and using electrical devices.
- Hold all local, state and country base qualifications to carry out such work.
- Adhere to all safety and installations requirements within this manual.

3. Product Information

PowerPlus Energy provides a range of mounting options to make your installation simple and easy.

They have been designed to suit indoor and outdoor applications and to suit a range of different battery capacities.

The technical information presented here within, outlines the characteristics of the cabinet and what environment they should be installed in.

The cabinets manufactured by PowerPlus Energy come with battery take-off leads pre-terminated with Amphernol Surloc connectors, colour coded cable and lugs, combining busbar, plastic shroud, take-off nuts, bolts and washers and in some cases, an adjustable 200-250A MCCB.

It is the responsibility of the systems integrator or installer to ensure cable entries are appropriately located to maintain ingress protection and compliance to standards and regulations.

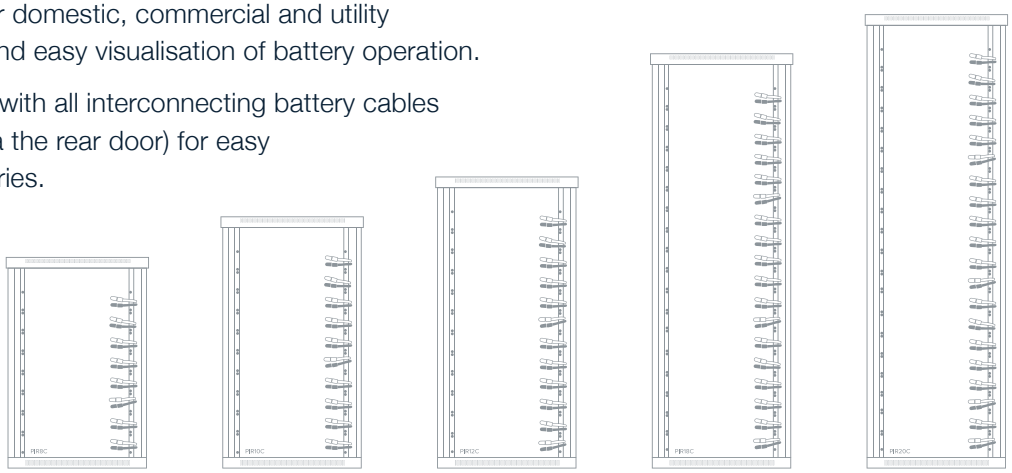
If you are unsure, please consult your PowerPlus Energy expert or the PowerPlus Energy web page for advice.

4. Rack Enclosures

4.1. RACK SERIES SPECIFICATIONS

Rack Series enclosures are for domestic, commercial and utility installations and allow quick and easy visualisation of battery operation.

The cabinets come pre-wired with all interconnecting battery cables and DC busbar (accessible via the rear door) for easy indoor installation of our batteries.



	PIR8C	PIR10C	PIR12C	PIR18C	PIR20C
Dimensions (H x W x D)mm	990 x 600 x 800	1166 x 600 x 800	1400 x 600 x 800	1800 x 600 x 800	2050 x 600 x 800
Colour	Black with glass front door (powder coated)				
Mounting	Floor				
Securing	4 x Caster rollers for positioning and 4 x load-bearing feet				
Feet	Adjustable				
Number of Battery Slots	8	10	12	18	20
Battery Connection Main Isolator	Busbar with M8 Stud 1000A Continuous rated (M8 nut, bolting and washer supplied)				
Battery Interconnection	Amphenol Surlok connector, 16mm double insulated cable (supplied and installed in cabinet for easy plug and play assembly)				
DC Circuit Breaker	None				
Cable Entry	Top or bottom entry				
IP Rating	IP21				
Weight	95kg	110kg	132kg	174kg	187kg

4.1.1. RACK SERIES ENCLOSURE INSTALLATION

Do not move cabinet while batteries are installed.

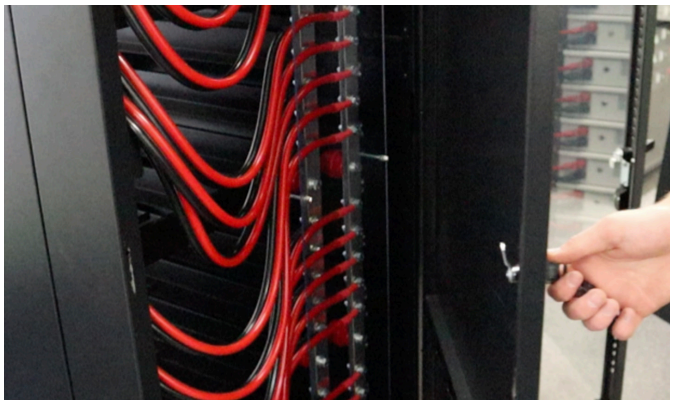
1. Wheel cabinet into position.
2. Choose cable entry position to suit your application. Multiple cable entries are positioned on and around the enclosure.
3. Ensure suitable glands or similar are used to protect the cables after forming cable entry hole.
4. Glands are not supplied and should be of the same or higher IP rating than the cabinet.
5. Ensure all filings from forming holes are removed from cabinet.
6. Connect main DC take-off cable from main system (PCE) DC isolator to the PIR enclosure DC busbar with M8 nut, washer and locking washer (supplied) and tighten.
7. Close rear door and move cabinet into final position.
8. Secure locking feet and wind down adjustable support legs until firm against the ground, transferring the cabinet weight from the castor wheels and ensuring cabinet is level.
9. Using equipment or at least 2 people to lift, slide the batteries into the cabinet starting from the bottom and working your way to the top.
10. Connect corresponding Amphenol cables to batteries.

Note: The castor wheels are not designed to take the weight of the cabinet and batteries. The adjustable support legs supplied must be used. Failure to use the support legs may result in failure of the castor wheels and cause physical harm or damage to battery storage system.

Note: Batteries should be loaded from the bottom of the cabinet working your way to the top. This ensures the cabinet remains stable.

Note: Cabinets have fans installed for cooling. Fans are 240V powered and are on when powered. Fans are not compulsory for cooling, but if your installation requires, an ambient temperature controlled switch (thermostat) may be required to turn it on and off as necessary. Available from any PowerPlus Energy place of purchase.

Note: When paralleling multiple cabinets, battery cables from each cabinet must be the same length and cable size to ensure cabinet impedances remain the same. The use of an external busbar is highly recommended.



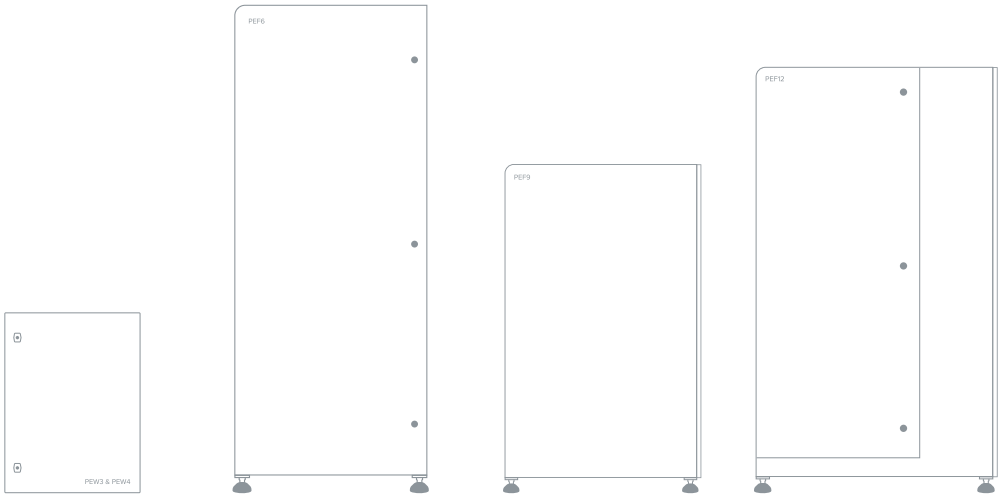
5. Slimline Enclosures

5.1. SLIMLINE SERIES SPECIFICATIONS

PowerPlus Energy Slimline Series enclosures are designed to provide low profile options for mounting the LiFe and ECO P series batteries.

Ranging in 300 to 400mm deep they are suitable for installation in walkways, sides of buildings, alongside industrial equipment and areas with limited space.

The cabinets come pre-wired with all interconnecting battery cables and a DC busbar for easy indoor or outdoor installation of our batteries.



	PEW3	PEW4	PEF6W - B250	PEF9W - 250	PEF12W-B250
Dimensions (H x W x D)	800 x 600 x 300mm	800 x 600 x 400mm	2002 x 802 x 304mm	1477 x 849 x 300mm	1750 x 975 x 504mm
Mounting	Wall		Floor		
Feet	N/A		Adjustable		
Number of Battery Slots	3	4	6	9	12
Battery Connection	Busbar with M8 Bolt, Nut & Washer		Takeoff lead into MCCB–M8 bolt & nut supplied		
Cooling	Natural convection		Temperature controlled (adjustable) fan forced	Natural convection	Temperature controlled (adjustable) fan forced
DC Circuit Breaker	N/A		2Pole Non Polarised 200–250A (adjustable) 1000VDC MCCB		
IP Rating	IP66		IP54	IP65	IP54
Weight	33kg	37kg	95kg	72kg	198kg
Internal Mounting Plate	N/A	N/A	965 x 735mm	N/A	475 x 1620mm
Clearance between plate and door	N/A	N/A	260mm	N/A	285mm

5.1.1. PEW3 & PEW4 INSTALLATION

The PEW3 and PEW4 are a wall mount battery enclosure for use in smaller storage solutions. The cabinets are suitable to be installed indoor or outdoor.

1. Securely mount the battery enclosure to the wall using appropriate fastening. Your fastening types will vary depending on wall surface and substrate.
2. The wall should be rated to carry all equipment, including up to 210kg for a PEW4 with 4 batteries installed.
3. Choose cable entry position to suit your application.
4. Ensure suitable glands or similar are used to protect the cables after forming cable entry hole.
5. Glands are not supplied and should be of the same or higher IP rating than the cabinet.
6. Ensure all filings from forming holes are removed from cabinet.
7. Connect main DC cable from main System (PCE) DC isolator to the PEW enclosure DC busbar with M8 nut, washer and locking washer and tighten.
8. Using a 2 person lift, insert batteries into cabinet standing them up vertically with battery terminals facing upwards.
9. Securely fasten batteries in places using provided clamp bar and nuts.
10. Connect corresponding Amphenol cables to batteries.

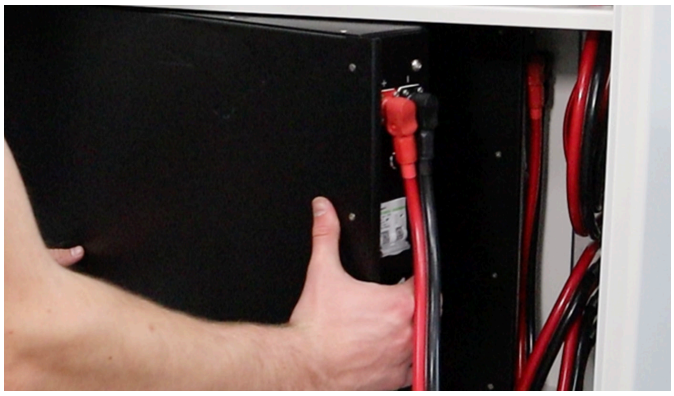
Note: Batteries should be loaded from the rear of the cabinet working your way to the front. This ensures the cabinet remains stable and weight is distributed closest to the wall.

Note: When paralleling multiple battery cabinets, battery cables from each cabinet must be the same length and cable size to ensure cabinet impedances remain the same. Use of an external busbar is highly recommended.

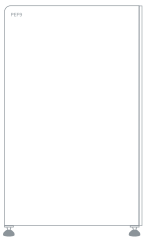
5.1.2. PEF6W-250B INSTALLATION

The PEF6W-250B is a BESS (Battery Energy Storage System) cabinets designed to house the PowerPlus Energy batteries and connected PCE's for charge and discharge. The cabinets are suitable to be installed indoor or outdoor.

1. The cabinet should be installed on level, solid surface. The surface should be concrete, brick, or similar.
2. It is recommended that the cabinet also be braced back to a wall for support.
3. The floor and wall should be rated to support all equipment, including up to 342kg plus the weight of other PCE's and balance of system installed.
4. The feet should be adjusted to level and stabilise the cabinet.
5. Choose cable entry position to suit your application. Cable entry can be positioned anywhere around the cabinet to suit the application.
6. Ensure suitable glands or similar are used to protect the cables after forming cable entry hole. Glands are not supplied and should be of the same or higher IP rating of the cabinet.
7. Ensure all filings from forming holes are removed from cabinet.
8. A detachable gear plate is provided for the mounting of PCE's and balance of system equipment.
9. It is not intended for cables to be run behind the gear plate.
10. DC isolator, main DC busbar and all interconnecting battery cables are provided and should installed to suit your layout inside the cabinet.
11. Up to 6 P Series batteries can be installed on the lower shelves. 3 per shelf.
12. Using appropriate equipment or at least 2 people, lift and slide the batteries into the cabinet starting from the bottom shelf at the rear and working your way to the front and the repeat on upper shelf.
13. Connect corresponding Amphenol Surlok cables to batteries.
14. The supplied fan assembly can have the fan removed and rotated to allow air to either be drawn into or out of the cabinet. It can be positioned in either of the cabinet vent holes.
15. The fans are 240V powered and come supplied with a temperature-controlled normally open thermostat that can be adjusted for turning the fan on and positioned to suit your installation.
16. In extreme conditions, it may be necessary to install additional cooling fans or vents.
17. All cabling supplied and installed by system integrator/installer must be do so in a manner as to be compliant to all local, national and international standards and regulations.



Note: Batteries should be loaded from the rear of the cabinet working your way to the front. This ensures the cabinet remains stable and weight is distributed closet to the wall.

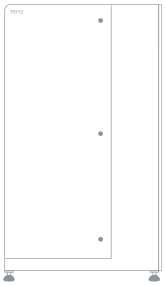


5.1.3. PEF9W-250 INSTALLATION

The PEF9W-250B wall/floor mount battery enclosure to securely house our batteries in an outdoor environment. The cabinets are suitable to be installed indoor or outdoor. The cabinet comes fully assembled for easy battery fitting on site. No extra wiring is required on site and is all plug and play.

1. The cabinet should be installed on level, solid surface. The surface should be concrete, brick, or similar.
2. It is recommended that the cabinet also be braced back to a wall for support.
3. The floor and wall should be rated to support all equipment, including up to 459kg
4. The feet should be adjusted to level and stabilise the cabinet.
5. Choose cable entry position to suit your application. Cable entry can positioned anywhere around the cabinet to suit the application.
6. Ensure suitable glands or similar are used to protect the cables after forming cable entry hole. Glands are not supplied and should be of the same or higher IP rating of the cabinet.
7. Ensure all filings from forming holes are removed from cabinet
8. The busbar assembly (including DC isolator) can removed for ease of battery installation or batteries can be manoeuvred around.
9. Batteries can be slid into place on their side with their battery terminals face outwards.
10. Using appropriate equipment or at least 2 people, lift and slide the batteries into the cabinet starting from the bottom shelf.
11. Secure the busbar assembly back into place.
12. Connect corresponding Amphenol cables to batteries.
13. PCE main cables or System main DC isolator can be connected to the main 250Amp (adjustable) integrated cabinet isolator.

Note: Batteries should be loaded from the rear of the cabinet working your way to the front. This ensures the cabinet remains stable and weight is distributed closet to the wall.



5.1.4. PEF12W-250B INSTALLATION

The PEF12W-250B is designed to be built into a BESS (Battery Energy Storage System) to house PowerPlus Energy batteries and connected PCE's for charge and discharge. The cabinets are suitable to be installed indoor or outdoor.

1. The cabinet should be installed on level, solid surface. The surface should be concrete, brick, or similar.
2. It is recommended that the cabinet also be braced back to a wall for support.
3. The wall should be rated to support all equipment, including up to 714kg plus the weight of other PCE's and balance of system installed.
4. The feet should be adjusted to level and stabilise the cabinet.
5. Choose cable entry position to suit your application. Cable entry can be positioned anywhere around the cabinet to suit the application.
6. Ensure suitable glands or similar are used to protect the cables after forming cable entry hole. Glands are not supplied and should be of the same or higher IP rating of the cabinet.
7. Ensure all filings from forming holes are removed from cabinet.
8. A detachable gear plate is provided for the mounting of PCE's and balance of system equipment.
9. It is not intended for cables to be run behind the gear plate.
10. DC isolator, main DC busbar and all interconnecting battery cables are provided and should installed to suit your layout inside the cabinet.
11. Up to 6 P Series batteries can be installed on the lower shelf, and an additional 6 P series batteries on the upper shelf.
12. Using appropriate equipment or at least 2 people, lift and slide the batteries into the cabinet starting from the bottom shelf and repeat on upper shelf.
13. Connect corresponding Amphenol Surlok cables to batteries.
14. The supplied fan assembly can have the fan removed and rotated to allow air to either be drawn into or out of the cabinet. It can be positioned in either of the cabinet vent holes.
15. The fans are 240V powered and come supplied with a temperature-controlled normally open thermostat that can be adjusted for turning the fan on and positioned to suit your installation.
16. In extreme conditions, it may be necessary to install additional cooling fans or vents.
17. All cabling supplied and installed by system integrator/installer must be do so in a manner as to be compliant to all local, national and international standards and regulations

Note: Batteries should be loaded from the rear of the cabinet working your way to the front. This ensures the cabinet remains stable and weight is distributed closet to the wall.

6. Maintenance

The construction of the cabinet is designed to minimise maintenance during normal operation, however the following checks are recommended at least every 6 months depending on operating conditions:

- Check all connections to be secure
- Check for signs of water or condensation inside cabinet
- Check for signs of insect or vermin
- Clean dust and other contaminations
- Check operation of fans
- Check and clean/replace filters.
- Check stability of mounting surface.

7. End of Life

When a PowerPlus Energy cabinet is removed from service it can be returned to PowerPlus Energy for recycling, or sent to a local recycler.

8. Warranty

PowerPlus Energy will protect this product under warranty when it is installed as written in this manual and used as set out in the warranty documents. Any product not being used or installed as outlined will be in violation of the terms and will render the product void of any warranty.

PowerPlus Energy does not cover warranty or any liability for damages or defects caused or from the following:

- Incorrect storage or transportation.
- Incorrect installation and wiring.
- Installed not according to this manual.
- Incorrect operation.
- Inappropriate environmental conditions when operating the battery.
- Failure to follow safety requirements.
- Unauthorised repairs or modifications.
- External influences such as physical damage.
- Used outside of warranty terms and conditions.

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