GivEnergy® Commercial

Commercial Energy Storage Solutions

PCS

Installation Manual

30, 50, 100, 150, 250 and 500kW PCS

GivEnergy Commercial Ltd

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Safety

It is critical that the below safety instructions are carefully read and understood. High voltage DC and 3 phase AC may be present within the PCS even when turned off.

- Only trained and qualified electricians should install or maintain the PCS
- The PCS is heavy and will require lifting equipment in all circumstances
- Before removing any covers the PCS should have the AC and DC supply isolated for a minimum of 15 minutes.

Signs and symbols in this guide

Warning of injury, pay particular attention

Risk of electrical shock

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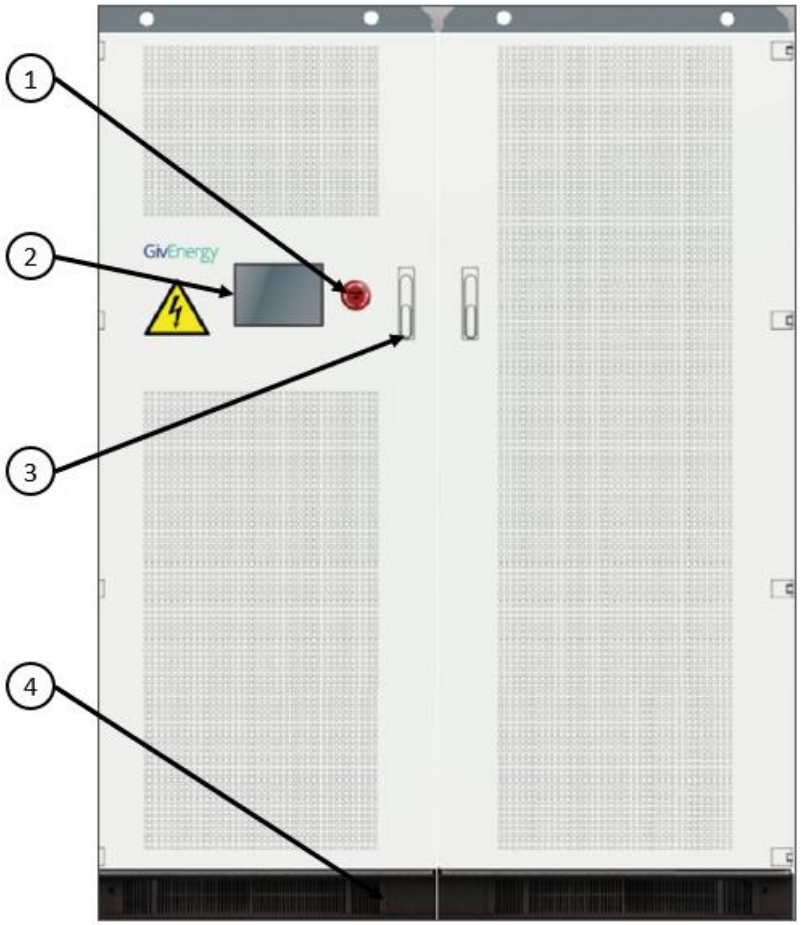
PCS components



1	Emergency stop (EPO)
2	LCD screen
3	Door handle
4	Removable lower trim

Note: 30, 50, 100 and 150kW units only have one door, 250 and 500kW units are double doored.

For technical support call 01377 252 874 or commecial@givenergy.co.uk

Required tools and equipment

- Gloves
- Socket/spanner set
- Screwdrivers
- Suitably rated lifting equipment[1]

[1] Please note that due to the weight of the PCS it may not be possible to utilise the delivery vehicles tail lift. As such a suitably rating forklift truck, telehandler of similar will be required

Delivery and unpackaging.

The PCS will be delivered palletised in a wooden box.

1. Starting with the top, release the metal retaining clips by unfolding them to a straight position then lift the top off.
2. Working around each side one at a time release the remaining retaining clips and remove each panel.
3. Remove the plastic and foam packaging.
4. Remove the lower black trim on all sides of the PCS – Be careful not to loose any of the bolts.
5. Unbolt the PCS from its pallet on all sides.
6. Lift the PCS to allow removal of the pallet being careful not to put any body part in a potential trap area.
7. The PCS can now be positioned using the lifting equipment or a standard pallet truck.
8. The key to the door is attached to the handle.

Key dimensions

Rating	30kW	50kW	100kW	150kW	250kW	500kW
Size *(W X D X H)*	800 x 800 x 2050				1200 x 800 x 2050	1600 x 1050 x 2050
Weight *(kg)*	600	650	910	950	1350	2460

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Installation environment

To ensure optimal operation and lifetime of the PCS it must be installed in an environment that meets the following criteria at a minimum;

- -30°C to 55°C
- 0 to 95% non-condensing humidity
- <5000m altitude
- In an area with adequate ventilation

The PCS must only be installed internally on level flat ground, it is possible to fix the it to the floor on each corner if required.

Ventilation

The PCS must have a suitable airflow to ensure optimal operation. If the PCS is being fitted against a wall then a vent/duct must be installed prior to finally positioning the PCS.

Please see 'PCS Ventilation guide' for more information.

Access

It is recommended that access to the area the system is located within is restricted. A password protected screen and locked door prevent immediate danger to the general public however some basic parameters and operations such as the emergency stop button are accessible.

The system should always be installed in a well lit area where access can be made available for maintenance purposes.

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Electrical and data connections

A 400v 3 phase AC supply is required, for maintenance purpose it is recommended that this supply can be locally isolated. AC and DC connection terminals are found at the bottom of the PCS below the MCCB's and switches within the front door. Connections are accessed by removing the terminal cover, depending on PCS version this may be the lower section below the MCCB's and switches or the whole lower front cove, take care not to loose the fixing bolts.

All connections require ring terminal lugs, do not over tighten the connections.

Cable sizing will be determined by length of run, cable type, installation type and maximum current rating of the PCS.

Rating	30kW	50kW	100kW	150kW	250kW	500kW
Max. Current *(A)*	48	80	160	240	400	800

AC grid supply

Before connecting to any terminals ensure all MCCB's and switches are in the OFF position and ALL supplies are safely isolated and tested.

The grid supply is connected to the QAC2 terminals marked grid. If uncertain the grid MCCB can easily be identified as it has a large contactor directly above.

If off grid functionality is a selected option this can be achieved via the same cable as the supply, this is common when providing back-up power to a whole site – Please speak to a GivEnergy representative if uncertain.

The AC supply must be tested for correct voltage, polarity and phase rotation before turning on the MCCB within the PCS.

A 'clean' earth should be provided to the PCS, this should be a separate earth ran directly from the MET of the site.

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EPS/UPS output

Before connecting to any terminals ensure all MCCB's and switches are in the OFF position and ALL supplies are safely isolated and tested.

The EPS/UPS output is connected to the QAC1 terminals marked EPS or Backup. If uncertain this can easily be identified as the MCCB does not have a contactor directly above.

The backup output terminals can be used when installing the PCS with a two cable method, this is common when providing back-up power to certain dedicated or essential circuits. – Please speak to a GivEnergy representative if uncertain.

DC connections

Before connecting to any terminals ensure all MCCB's and switches are in the OFF position and ALL supplies are safely isolated and tested.

Using the cables provided with the battery cabinet(s), connect the positive and negative cables to the DC input terminals on the left hand side.

Take great care to ensure correct polarity, the DC supply must be tested for correct voltage and polarity before turning on the DC switch within the PCS.

Supply to battery/DC cabinet

A power supply is required to supply the battery cabinet (or DC cabinet if fitted), using the wiring harness provided connect onto Phase 1 of the EPS output MCCB, Neutral and Earth.

Data connections

The PCS takes an external control signal from the GivEnergy EMS located within the battery racking/cabinet(s).

Depending on the version of PCS the data connections can either be found to the left hand side outside of the AC and DC connection cover OR in the centre behind the AC and DC connection cover.

The PCS communicates with the EMS via CAN bus, using the cable supplied with the battery cabinet(s) connect to the terminals marked BMS CAN H and CAN L.

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Final assembly

Once all connections are made and tested the lower black trim can be re installed on all accessible areas using 2 bolts on each side to secure.

Once electrical testing is completed the lower cable entry cover should also be reinstalled.

Power on procedure

Once all connections are terminated correctly with satisfactory test results the following turn on procedure should be followed;

1. Release the emergency stop button if pressed
2. Turn on the AC Supply MCCB (QAC2)
3. Wait for the screen to power up and display grid voltage[1]
4. Turn on the EPS output MCCB (QAC1)
5. Wait for the screen to show voltage on 'load'
6. Turn on the battery system following the batteries instructions
7. Turn on the DC Switch and check for the correct DC voltage on the screen
8. Follow instructions in the 'Operational Settings' section

[1] On first start up/initial commissioning it is advised that the Operational settings are checked after step 2 before proceeding to next steps

Shutdown procedure

In an emergency press the emergency stop button on the PCS first then all battery cabinets/racks.

1. Follow instructions in the 'Operational Settings' section
2. Press the emergency stop button
3. Turn off the AC and EPS MCCB's
4. Turn off the DC switch

Caution: Always wait at least 15 minutes for the internal capacitors to discharge before removing safety covers.

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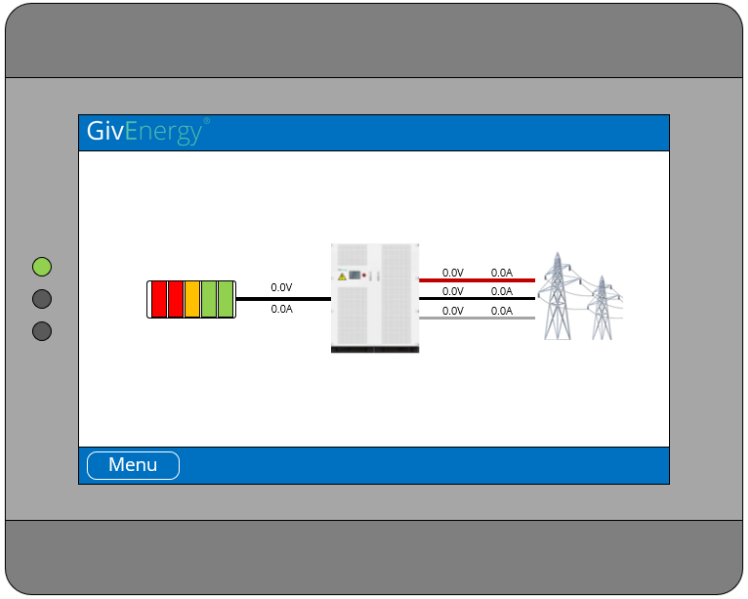
Operational settings

A number of settings should be confirmed on initial start up to ensure correct operation. It is recommended that these settings are checked prior to connecting the PCS to the battery system. The commissioning engineer will provide the required settings. The default password for access to the settings with the PCS screen is: '888888' [1]



LED	Status	Definition
	Flashing	Grid on
	Solid	Operational
	Flashing	Fault

[1] If the default password is changed please inform GivEnergy for maintenance and warranty purposes, if the default password is forgotten the PCS will have to be fully reset at the purchasers cost.

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PCS Screen information			
Home screen	Battery	Battery information *(When communication is established)*	
	PCS	PCS information	
	Grid	Grid information	
	Load	Not used	
Menu button	Turn on	Starts the PCS when in local control	
	Stand-by	Puts the PCS into standby when in local control	
	Turn off	Stops the PCS when in local control	
	Host	Return to home screen	
	RT.Data	View real time data	
	Record	View historic data	
	System *Parameter setting*	Control mode	Local – Control operation from PCS screen Remote – Control via EMS
		Constant Power	Operating power of PCS *(Auto set when in remote control)*
		Advance settings	GivEnergy operation only
	System *Battery setup*	GivEnergy operation only	
	System *Automatic operation*	Set time schedules for local operation	

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Initial testing/commissioning

All GivEnergy commercial storage solutions include an on-site commissioning service, our engineer will ensure correct communication with meter, battery packs, EMS and PCS. To aid in this testing the engineer will initially run a low power test in 'manual' mode setting the system to complete a 5 minute charge followed by a 5 minute discharge and a rate of 10kW.

Once this is complete where electrical supply parameters allow a full power charge and discharge will be ran for a period of 15 minutes each. If electrical limitations on site do not allow this test will be adjusted to power levels with site tolerance.

Any additional tests can now be completed include system specific operation such as back up power.

Once above testing is successfully completed the system will be set to run in its agreed operational modes and a demonstration can be given to the client and/or installer.

Our engineer will supply commissioning paperwork once complete, the date of which will commence the PCS warranty.

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Maintenance

Ensure that the front door and rear ventilation are not restricted or clogged with dust.

An annual check of all emergency stop buttons and protective devices is recommended.

Support

Free remote support is included with all systems for the period of the warranty.

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Email: commercial@givenergy.co.uk

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