

# GivEnergy

Energy Storage  
For  
Commercial, Industrial and Grid



# Specification

## Giv-SME

Small and Medium-Sized Enterprise Energy Storage Solutions

### AC Specifications

	GivPCS-30	GivPCS-50
Wiring Methods	Three Phase Five Wires	
Nominal Power Capacity	30kW	50kW
Maximun Power	33kVA	55kVA
Nominal Grid Voltage	400V	400V
Voltage Range (Grid Tied)	400V+10%(settable)	400V+10%(settable)
Voltage Range (Off Grid)	400V±5%	400V±5%
Nominal Current	44A	72A
Maximum Current	48A	79A
Nominal Frequency	50Hz	50Hz
Frequency Range	47~51.5 (settable)	47~51.5 (settable)
THDI	<3% (Nominal Power)	<3% (Nominal Power)
Power Factor	0.9 (Leading)	0.9 (Lagging)

### DC (Battery) Specifications

Nominal Power	30kW	50kW
DC Voltage Range	0V~900V	0V~900V
Full Load Voltage Range	350V~850V	350V~850V
Nominal Current	91A	150A
Stabilized Voltage Precision	±1%	±1%
Stabilized Current Precision	±2%	±2%

### PCS System

Maximum Conversion Efficiency	0.95	0.955
Weight	490kg	600KG
Dimensions	Standard 19" 42U	Standard 19" 42U
Altitude	5000 meter (Derated when > 3000 meter)	5000 meter (Derated when > 3000 meter)
IP Grade	IP20	IP20
Noise	<65dB	<65dB
Operating Temp Range	-35°C~+45°C	-35°C~+45°C
Storage Temp Range	-40°C~+70°C	-40°C~+70°C
Cooling Method	Forced Cooling	Forced Cooling
Humidity	0~95%	0~95%
Communication	Enthernet, RS485, CAN2.0	Enthernet, RS485, CAN2.0

### Others

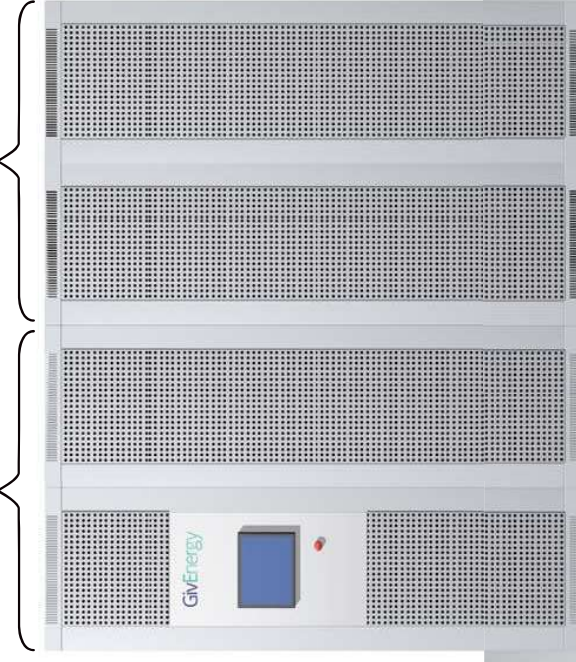
Phase Imbalance Operating Capability	100%
Parallel Capability	Yes

### Battery

Battery Pack	8.448kWh Standard 19"
Battery Pack Voltage	76.8Vdc
Battery Rack	59.1kWh Standard 19" 42U
Battery Rack Voltage	537.6Vdc
Rack Scaleable	Yes

50kW/59kWh

Scaleable 118kWh



30kW/50kW PCS

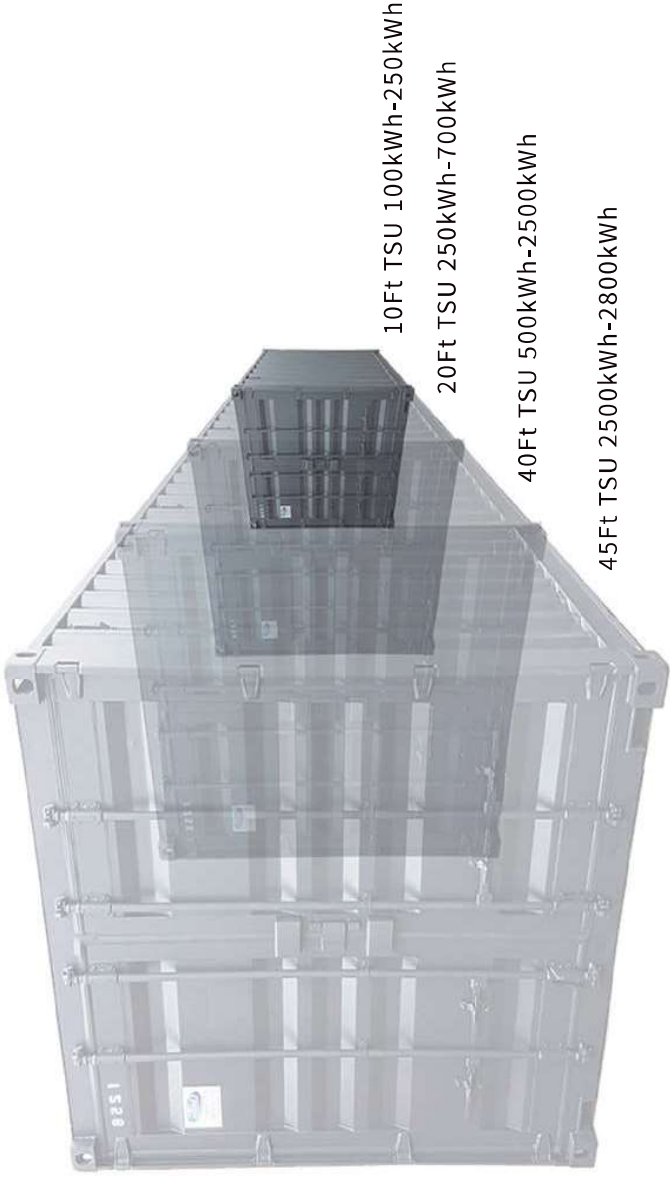
59kWh Scaleable Battery Cabinet Solution

# GivEnergy

# Terminal Support Unit

## Energy Storage System

- ◆ Bridge Power Gaps in Generation
- ◆ Backup Power for Grid Upgrades and Planned Maintenance
- ◆ Peak shaving and load shifting
- ◆ PF Regulation and Voltage Support
- ◆ Time of use ready
- ◆ DUos- Green, Amber, Red rates
- ◆ TnUos- Triad Avoidance
- ◆ UPS (Optional)



10Ft TSU 100kWh-250kWh

20Ft TSU 250kWh-700kWh

40Ft TSU 500kWh-2500kWh

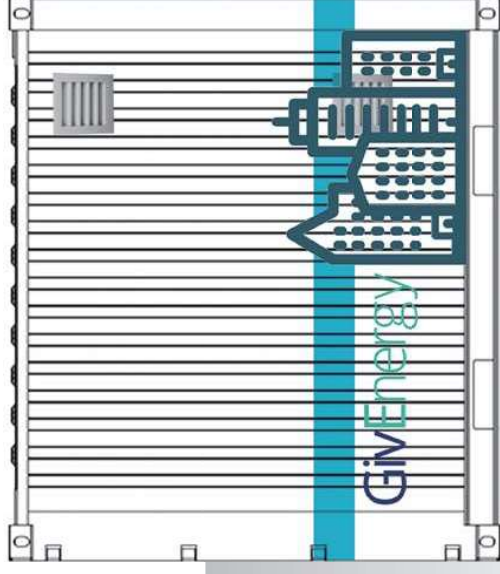
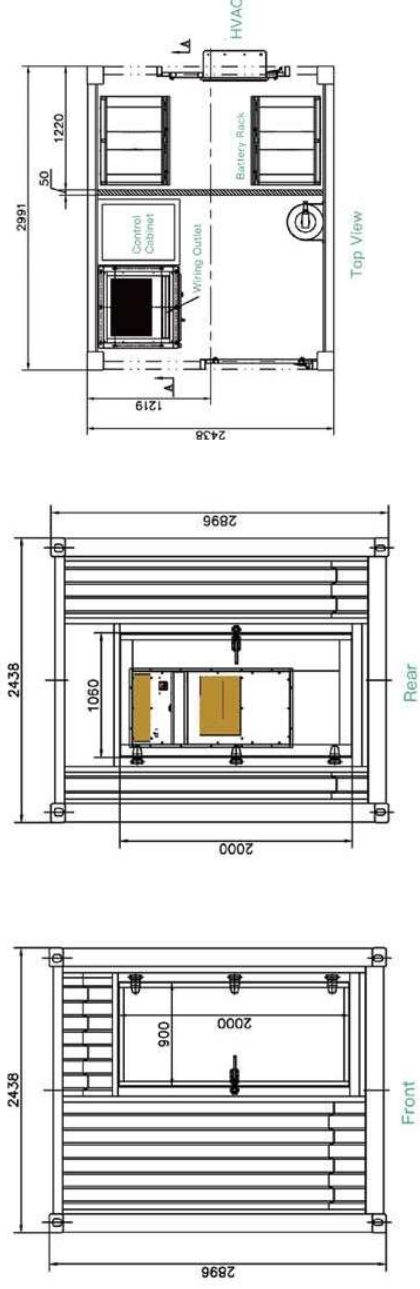
45Ft TSU 2500kWh-2800kWh



- ① Battery Pack
- ② Power Conversion System
- ③ Central Control and Environment Monitoring
- ④ Fire Suppression Equipment
- ⑤ Industrial Air Conditioning

# 10ft Container ESS

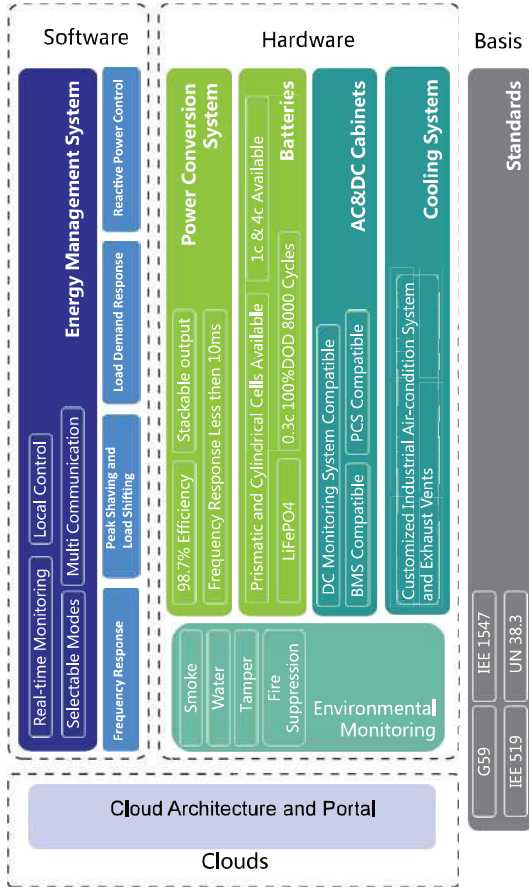
- ◆ Fire Suppression system
- ◆ Full HVAC System Install
- ◆ BMS-Building Management System
- ◆ Fully customizable to your requirements



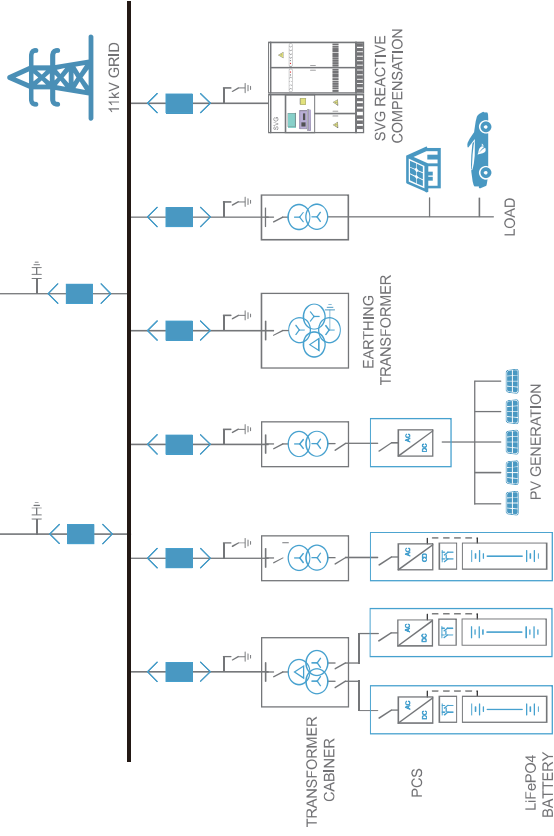


# Integration

## Integration



## Energy Storage System Applications



# Commercial Battery Cells, Packs and Racks

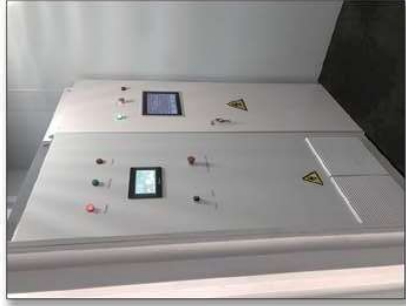
Battery Cell LiFePO4	
Cell Model Number	JMH-IFP-55AH
Cell Type	LiFePO4 Energy Type
Appearance	Square Aluminum Case
Capacity	55Ah
Voltage	3.2V
Weight	1150±100g
Self-consumption	≤3%/Month (30%SOC, 20±5°C, 28day)
Energy Density	153Wh/kg
Charge and Discharge Character	2C Discharge/1C charge@25°C
Internal Resistance	≤0.65mΩ
Voltage Difference	<0.05 V
Actual Capacity	≥55Ah
Charging Working Temperature	-5°C~60°C
Discharging Working Temperature	-20°C~60°C
CC-CV Charging Mode	3.65V
Discharging Cut-off Voltage	2.5V
Dimension	23*140*160 mm



Battery Pack	
Cell	48 pcs
Connection Method	3P16S
BMU	1pcs
Nominal Voltage	51.2Vdc
Voltage Range	32.0~58.4Vdc
Capacity	165Ah
Energy	8.4kWh
Maximum Continuous Discharge Power	8.4KW
Nominal charge current	165A
Charge Method	CV/CC/CP
Cut-off Voltage	58.4Vdc
Cut-off Current	8.25A
Rated Discharge Current	165A
Standard Discharge Method	CC
Temperature Working Range	0°C~40°C
Weight	75kg

Battery Rack	
Nominal Voltage	665V/768V
Maximum Charge Voltage	759V/876V
Cut-off Discharge Voltage	582V/672V
Nominal Current	165A
Energy	109kWh/126kWh
Power	109kW/126kW
Dimensions	800*600*2140mm

# Commercial OEM Installations



PCS Cabinet  
BMS Cabinet



BMS Display



Fire Suppression



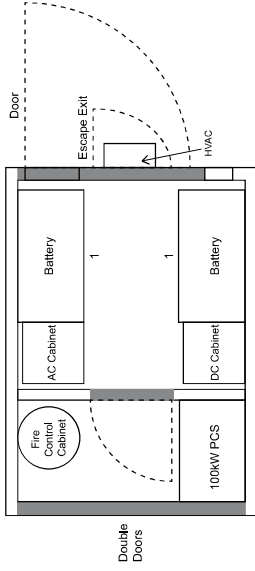
Battery Rack



HVAC

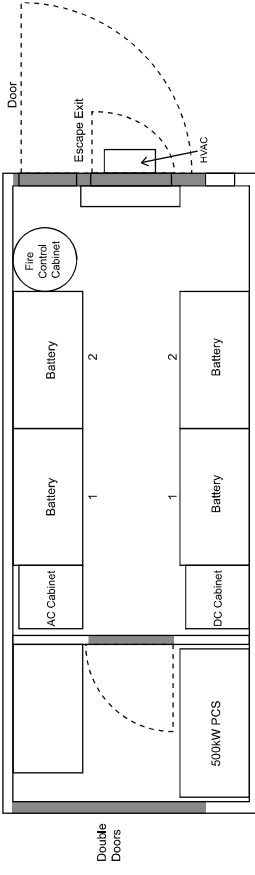


## 10' Container Solution



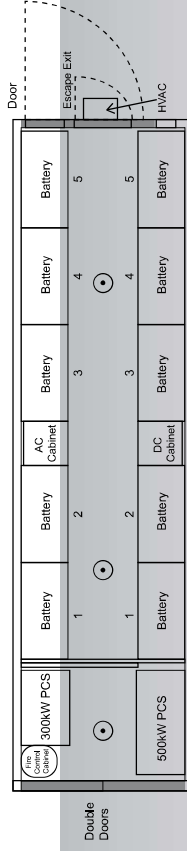
Standard 10' Container Solution  
 11.1'x8.0'x9.5 feet  
 100kW / 218kWh or 100kW / 327kWh

## 20' Container Solution



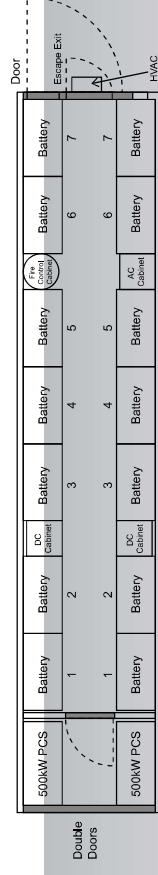
Standard 20' Container Solution  
 19.9'x8.0'x9.5 feet  
 100kW / 436kWh or 250kW / 763kWh

## 30' Container Solution



Standard 30' Container Solution  
 29.9'x8.0'x9.5 feet  
 500kW / 1MWh or 750kW / 1.6MWh

## 40' Container Solution

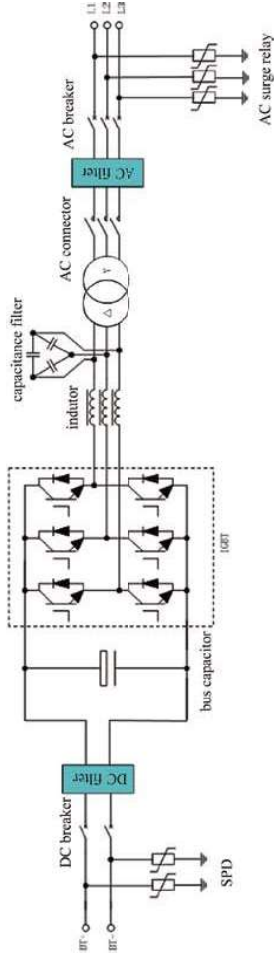


Standard 40' Container Solution  
 40'x8.0'x9.5 feet  
 1MW / 1MWh or 1MW / 2MWh



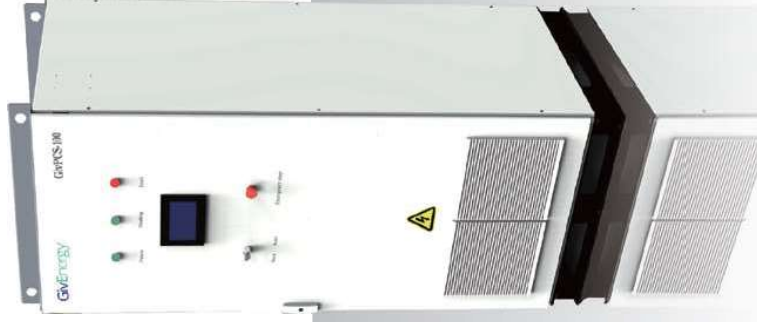
# Bi-Directional PCS

## Hardware



- ◆ Hybrid design, on-grid, off-grid and energy storage function combined
- ◆ Bidirectional conversion available
- ◆ Autonomous energy management system
- ◆ Intelligent charging function
- ◆ Multi source renewable integration
- ◆ Black start-up compatibility
- ◆ Autonomous phase balancing
- ◆ Online seamless handover between on-grid and off-grid modes.
- ◆ Active and reactive power control (instantly)
- ◆ Support various loads type, independently or mixed
- ◆ Comprehensive and high precision operation and fault monitoring and recording

100kW Power Conversion System



500kW Power Conversion System



# Specification

PCS

Model	GivPCS-100	GivPCS-250	GivPCS-500
AC connection method	Three-phase three-wire	Three-phase three-wire	Three-phase three-wire
<b>Parameters in battery side</b>			
Rated power	100kW	250kW	500kW
DC voltage range	500V~900V	500V~900V	500V~900V
DC voltage range of full power	500V~850V	500V~850V	580V~850V
Rated running current	207A	517A	880A
Voltage stabilizing accuracy	≤1%	≤1%	≤1%
Current stabilizing accuracy	≤2%	≤2%	≤2%
<b>Parameters in battery side</b>			
Rated power	100kW	250kW	500kW
Max.capacity Rated	110kVA	275kVA	550kVA
Grid voltage	400V	400V	400V
Voltage range (grid-connected)	400V+10%(Adjusteable)	400V+10%(Adjustable)	400V+10%(Adjustable)
Voltage range(off grid)	400V±5%	400V±5%	400V±5%
Rated current	145A	362A	721A
Max.running current	159A	398A	794A
Rated grid frequency		50HZ	
Frequency range		47~51.5(Adjustable)	
THD		<3%(rated power)	
Power factor		0.9(lead)-0.9(lag)	

# Specification

PCS

## Model

GivPCS-100

GivPCS-250

GivPCS-500

Low voltage ride through  
Anti-islanding mode  
AC over current/short circuit protection  
AC over voltage/under voltage protection  
AC over frequency/under frequency protection  
Phase sequence fault protection  
C over current/short circuit protection  
DC over voltage/under voltage protection  
DC reverse polarity protection  
Over temperature protection  
Insulation protection  
Power module(IGBT) protection

Yes  
Yes (support planned Island)  
Yes  
Yes  
Yes  
Yes  
Yes  
Yes  
Yes  
Yes  
Yes  
Yes  
Yes

## System

Max. conversion efficiency  
Dimension(W\*H\*D)  
Weight  
Altitude  
Protective class  
Noise  
Operating temperature  
Storage Temperature  
Cooling  
Relative humidity  
Communication

0.97  
807mm\*1976mm\*860mm  
930kg  
IP23  
<65dB  
35°C~+45°C  
-40°C~+70°C  
Forced Air cooling  
0-95%, No condensation  
Ethernet, RS485, CAN2.0, Modbus, Bacnet

0.987  
1406mm\*1976mm\*650mm  
950kg  
5000m  
IP23  
<65dB  
35°C~+45°C  
-40°C~+70°C  
Forced Air cooling  
0-95%, No condensation  
Ethernet, RS485, CAN2.0, Modbus, Bacnet

# Specification

## Introduction

The Battery Management System (BMS) comprises of the following items:

(BMU) Battery Module Monitoring Unit, This is used to monitor each 8.448kWh pack and monitors the cell voltages and temperatures of each cell within the pack,

(BCMS) Battery Cluster Management Unit. This is used to monitor all 8.448kWh packs within a rack, This also monitors Pack voltages, Pack Temperatures and monitors SoC of each pack when charging and discharging.

(DMU) DC Monitoring Unit. This monitors the central DC BUS and controls the upper and lower voltage limits of the battery pack.

(BAMS) Battery Rack Automatic Management System, This is the Heart of the control system and is used to read all battery packs in regards to voltages, currents, SoC. This unit also control the charge and discharge rates of the battery packs, manages pack voltages and temperatures and adjusts safety/grid parameters accordingly.

## Master BMS

Name	
Voltage Range	18~32V
Cell Voltage	0~5V
Cell Voltage Error Range	≤ ±3mV
Voltage and Tep Acquisition Cycle	≤5ms
Current Acquisition Range	≤300A
Current Acquisition Error	≤ ±1%
Current Acquisition Cycle	≤1ms
Temperature Acquisition Error	≤ ±1°C
Temperature Acquisition Range	-20~60°C
Battery Balanced Current	2A
Communication with PCS	CAN
Communication with EMS	Ethernet
History Event	≥100000 packet
History Store	≥90 day

## BAMS



## Production

- ◆ SOC high protection
- ◆ SOC low protection
- ◆ Rack overvoltage protection
- ◆ Rack undervoltage protection
- ◆ Rack overcurrent protection
- ◆ Single cell overvoltage protection
- ◆ Single cell undervoltage
- ◆ Single cell overcurrent protection
- ◆ Single cell over temperature protection
- ◆ Single cell low temperature protection
- ◆ Short circuit protection
- ◆ Fire protection

## Communication

