



Energy Storage & Microgrid Solutions Driven By Pytes



version	Revision date	Revision	Revisers	auditor
V1.0	2025-6-15	/	Dingyuanpeng	Xuhuiming
V1.1	2025-10-17	Delete PI STATION 372, Delete PI Cube 3.72MWh Add HV48300CE, add HV48300UL	Dingyuanpeng	Xuhuiming

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▶ **PI STATION Serie**

- PI STATION 230EX - Outdoor Cabinet BESS
- HV48300-CE/UL - Outdoor DC Cabinet BESS
- PI STATION 417 - Outdoor DC Cabinet BESS

PI STATION 230EX

Outdoor cabinet ESS



Features



Flexible

- All-in-one design and highly integrated
- Modular design with different optional parts



Compatible

- Grid-tied
- 400Vac 3P4W



Easy-to-Install

- IP55 rated
- Parallel installation back-to-back



Compliance

- Global grid certified & listed PCS
- Compliance with global safety standards

Specification

Mode	PI STATION 230EX
Battery Chemistry	LFP (LiFePO ₄)
Nominal Output Power	105KW
Battery Capacity	232.96kWh
Operating DC Voltage Range	650V-949V
Recommended. Charging/ Discharging Current	140A
Fire Fighting System	1.Sensor Tube(Aerosol) 2.Water Fire Fighting System 3.Heat/Smoke/Gas sensor
Cell Cycle life	6000
DOD	90%
Communication port	CAN, RS485, Ethernet
Communication protocol	Modbus RTU/TCP
Dimensions(W x D x H)	1000 x 1390 x 2330mm
Weight	2500kg
Cooling System	Liquid cooling
IP protection	IP55
Reactive Humidity	0-95% (no condensing)
Operating Temperature Range	-20~55°C
Recommended Cell Temperature Range	Charge:0~55°C; Discharge:-20~55°C
Altitude	2000m (>2000 derating)

Regulations

CELL

IEC 62619:2022, IS 16046 (PART 2) : 2018 / IEC 62133-2 : 2017, UL1642, UL1973, UL9540A, GB/T36276-2023, GB 38031-2020, GB/T 31486-2015, GB/T 31484-2015, GB/T 30512-2014, UN38.3, REACH, RoHS

PCS

CE-EMC, CE-LVD,62109-1/-2, 50549-1/-10 European General, 50549-2/-10 European General, South Africa NRS097, 50549-2+Netherlands, 50549-2+Netherlands, 50549-2+C10/11, Belgium typeB, 50549-1+Greece, 50549-2+Sweden, 50549-1+Poland typeA, 50549-2+Poland typeD, UK-G99 Amendment 10 typeA, UK-G99 Amendment 10 typeD, Germany-VDE-AR-N 4105:2018, Germany-VDE4110&4120, Tor Erzeuger, 50549-2+Czech Republic, 50549-2+Hungary, 50549-2+Romania, 50549-1+Denmark, 50549-1/-10 +France, 50549-2/-10 +France, 50549-2/-10+Finland, Thailand MEA Report, Thailand PEA Report, IEC 61727&62116, Spain 217001, Spain 217002-A, Spain 217002-B, Spain NTS631-A, Spain NTS631-B, Spain NTS-SENP-A, Spain NTS-SENP-B, Australia AS/NSZ 4777, Italy CEI 0-21, Italy CEI 0-16, 50549-2/-10+Switzerland

System

UN38.3, IEC62619, IEC63056, IEC62477, CE-EMC

Appearance



HV48300-CE/UL

Outdoor DC cabinet BESS



Features

Safe

- Tier 1 automotive grade LFP cells
- BMS multi-level monitoring and protection
- 4-layer active fire suppression system

Scalable

- Seamlessly scale from 200 kWh to 2 MWh with our flexible, modular battery system – ideal for commercial and industrial – scale applications

Flexible

- Flexible battery string configurations adapts to diverse inverter voltage ranges
- Flexible mounting structure seamlessly fits various inverter models

Compliance

- Remote monitoring with PYTES Battery Cloud
- Intelligent EMS optimizes ROI by dynamically balancing supply and demand to enable energy arbitrage, reduce electricity costs

Specification

System	HV48300-CE		
Max. Battery Pack Internal Configuration	13S1P(CE)	14S1P(CE)	15S1P(CE)
Rated Energy	186.368kWh	200.70kWh	215.04kWh
Rated Power	93.184kW	100.35kW	107.52kW
Operating Voltage	582.4~748.8V	627.2~806.4V	672~864V
Rated Charge/Discharge Current	140A	140A	140A
Peak Charge/Discharge Current	170 A (@60s)	170 A (@60s)	170 A (@60s)
Dimensions (WxDxH)	1200 x 1100 x 2250 mm (47 x 43 x 89 in)		
Weight	2248kg	2384kg	2500kg
Operating Temperature	Charging: 32 °F~131 °F (0 °C~55 °C)		
Relative Humidity	Discharging: -13 °F~131 °F (-25 °C~55 °C)		
Ingress Rating	5%~95% RH, non-condensing		
Level 1: Detection & Ventilation	IP55		
Level 2: Aerosol Suppression	Hazardous gas detection activates ventilation system		
Level 3: Pressure Relief	Heat and smoke detection activates aerosol fire suppression system		
Level 4: Fire Hose Port	The explosion relief valve opens automatically if internal pressure exceeds safe limit		
Rated. Cooling Capacity	The explosion relief valve opens automatically if internal pressure exceeds safe limits		
Rated Heating Capacity	Equipped with a fire hose connection port for firefighting personnel		
Certifications	5000 W (L35)		
	2500 W		
	CE, IEC62619, GB/T 36276, UN 38.3		

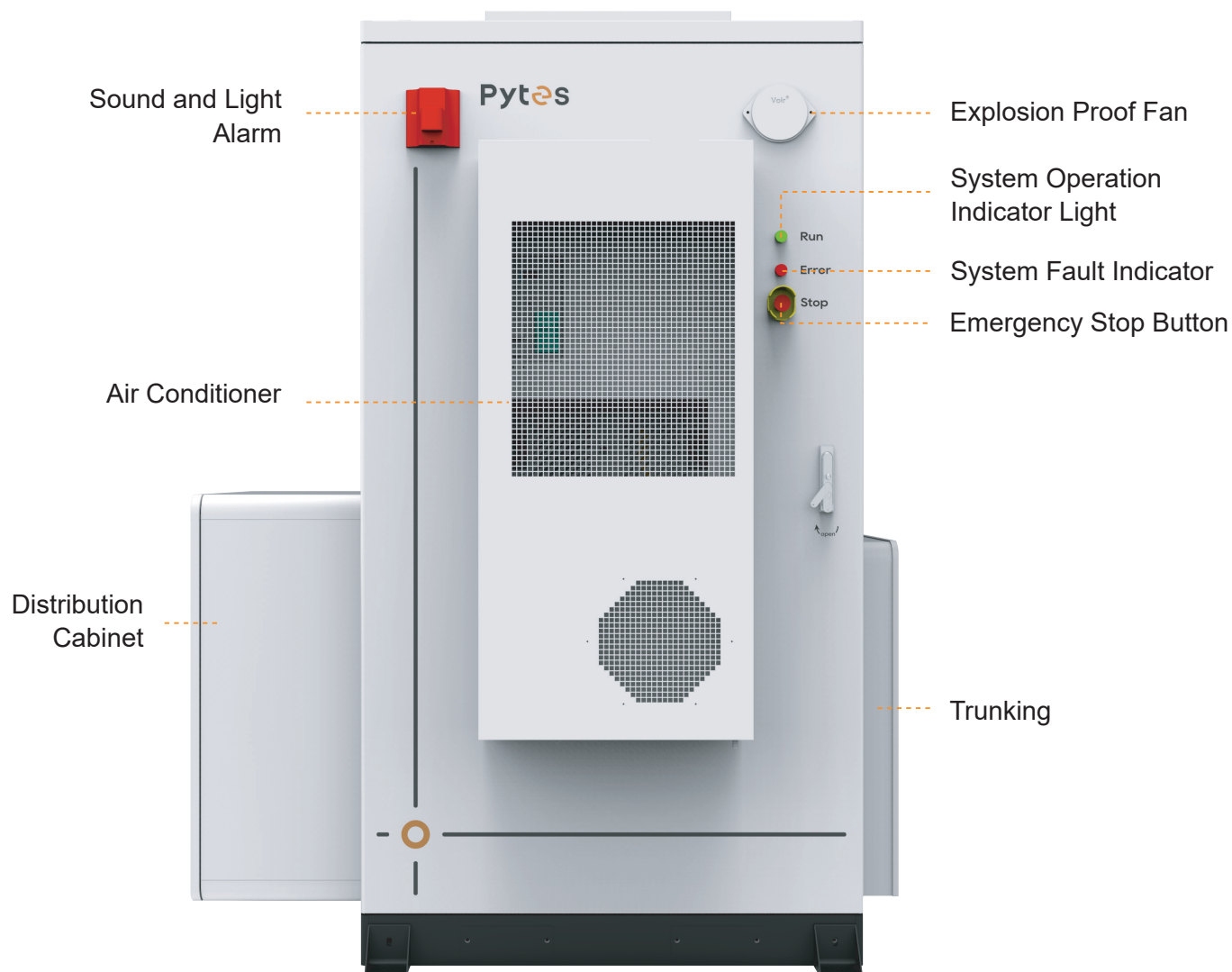
*All components meet CE certification standards (including fire protection)

Specification

System	HV48300-UL
Max. Battery Pack Internal Configuration	7S2P(UL)
Rated Energy	200.70 kWh
Rated Power	107.52 kW
Operating Voltage	313.6~403.2 V
Rated Charge/Discharge Current	280 A
Peak Charge/Discharge Current	170 A*2 (@60 s)
Dimensions (WxDxH)	1200 x 1100 x 2250 mm (47 x 43 x 89 in)
Weight	2409kg
Operating Temperature	Charging: 32 °F~131 °F (0 °C~55 °C) Discharging: -13 °F~131 °F (-25 °C~55 °C)
Relative Humidity	5%~95% RH, non-condensing
Ingress Rating	IP55
Level 1: Detection & Ventilation	Hazardous gas detection activates ventilation system
Level 2: Aerosol Suppression	Heat and smoke detection activates aerosol fire suppression system The explosion relief valve opens automatically if internal pressure exceeds safe limit
Level 3: Pressure Relief	The explosion relief valve opens automatically if internal pressure exceeds safe limits
Level 4: Fire Hose Port	Equipped with a fire hose connection port for firefighting personnel
Rated. Cooling Capacity	5000 W (L35)
Rated Heating Capacity	2500 W
Certifications	UL 9540 Ed.3 (2023), UL 9540A, UL 1973, IEC62619, GB/T 36276, UN 38.3

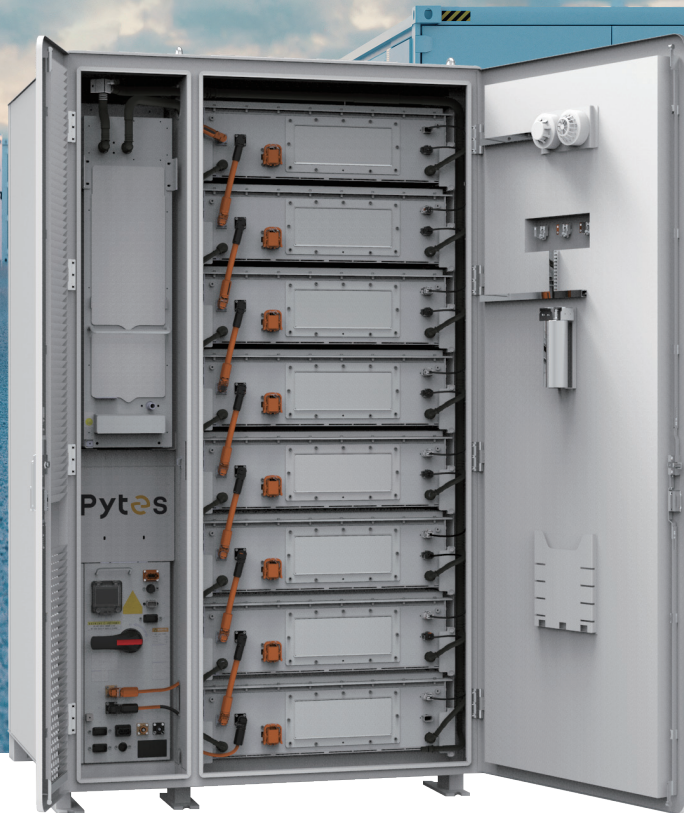
*All components meet UL certification standards (including fire protection)

Appearance



PI STATION 417

Outdoor DC cabinet BESS



Features



AccurateFle

- Excellent Cell Consistency
- Non-destructive Safety Detection Technology



Economic

- 90% DOD 6000 Cycles
- Calendar Life 10 Years



Stable & Reliable

- Efficient Thermal Management
High durability of components



Easy Installation

- IP54 Rated Outdoor Cabinet
- Easy Transportation & on-site Installation



Scalable

- Parallel use of multiple systems,
covering wide power range

Specification

Module	PI STATION 417
Configuration	1P416S
Rated Voltage	1331.2V
Rated Energy	417.99kWh
Rated Power	208.995kW
Volt range	1164.8V ~ 1497.6V
Weight	3800kg
Dimension	W1400*D1340*H2360mm
Altitude	≤2000m
Operating ambient temperature	Charging: 0~55°C Discharging: -25~55°C
Environment Humidity	5%~95% RH
Rated Charge Current	157A
Rated Discharge Current	157A
Pulse Charge Current	188A (Lasts 60s)
Pulse Discharge Current	188A (Lasts 60s)
Storage temperature	-30~60°C
IP Level	IP54
Thermal Management	Liquid cooling/heating
Auxiliary Power Supply	220 ± 20%V AC, 47~53Hz
Communication Protocol	CAN/RS485/LAN
Implementation Criteria (cell)	GB/T 36276, UN38.3, UL9540A, UL1973, IEC62619
Implementation Criteria (for system)	IEC62477, IEC62619, IEC 62933-5-2, IEC63056, IEC61000-6-2/4, UN3480

2 ► **PI CUBE Serie**

- PI CUBE 5MWh - 20ft Container BESS

PI CUBE 5MWh

20ft Container BESS



Features



Flexible Configuration

- Widely applicable scenarios
- Module Scalability



Strong adaptability

- Normal operation within -30°C to 60°C
- A-class fireproof and flame-retardant material for the box body



High Efficiency & Stability

- Efficient battery
- High cycle life and low cost

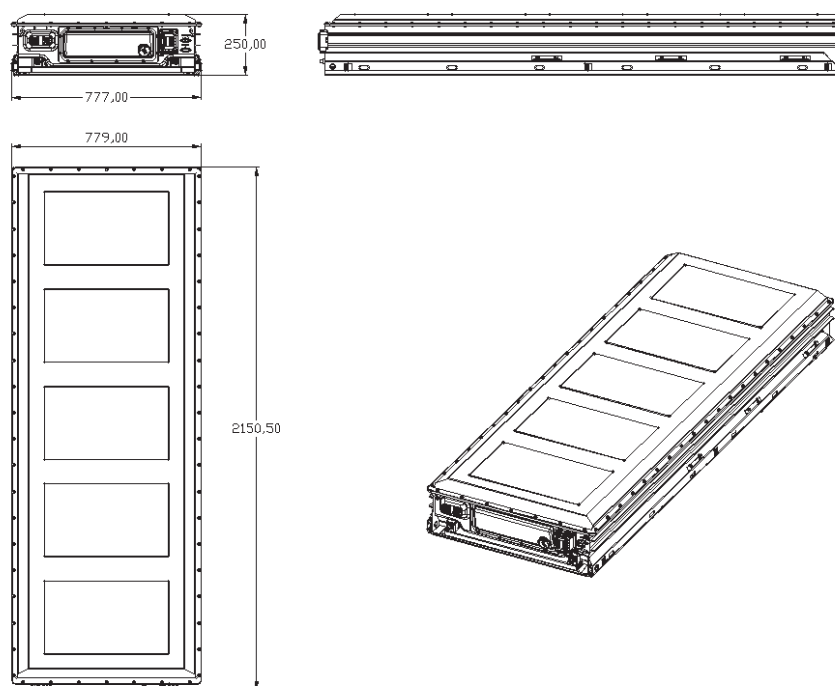


Safety & Compatibility

- A comprehensive monitoring and management system
- Fire protection and protective measures

Specification

Module	PI CUBE 5MWh	Remark
Configuration	416S12P	
Rated Energy	5015.9kWh	100%DOD , 0.5P
Rated Voltage	1331.2V	
Operating Voltage Range	1040~1500V	For cell 2.5V~3.65V
Dimension	6058mm×2438mm×2896mm	L×W×H , 20HQ
Mass	~44000kg	
Rated charge power	0.5P (2507kW)	According to current map (5.1~5.4)
Rated discharge power	0.5P (2507kW)	According to current map
Short overload charging power	5015kW (for 0.5P system) @60s	According to current map (5.1~5.4)
Short circuit current	149.25kA@12 rack	13.61kA@1 rack
Operating ambient temp.	-30~60°C	
IP level of cabin	Bat. Room IP55 Electric room IP55 Chiller controller module IP55	
Efficiency	≥93.8%@0.5P, ≥95.2%@0.25P	
Insulation standard	≥1000Ω/V	Test voltage 2500VDC
Withstand voltage	4500VDC, leakage current ≤5mA, no breakdown or flashover	
Cooling and heating type	Liquid cooling / heating	
Refrigerating Power	60kW @ Ambient temp 35°C 55kW @ Ambient temp 45°C	
Heating Power	27kW	
Auxiliary power supply	27kW@ Ambient temp 35°C 33.5kW@ Ambient temp 45°C	Including BMS and cooling system
Communication agreement	CAN, RS485, TCP/IP	
Implementation criteria	UL1973-2022, IEC62619-2022, UN38.3 UL9540A-2019, GB/T 36276-2023	For cell
	IEC62477-2022, IEC62619-2022, IEC63056-2020, IEC60730-2022, NFPA855-2023, NFPA68-2023, NFPA69-2019	For system



Item	Spec.
Rated Energy	104.499kWh
Rated Voltage	332.8V
Allowable voltage range	260V~379.6V
Dimension	$2150.5 \pm 5 \times 779 \pm 2 \times 259 \pm 2$ (mm)
Mass	680 ± 5 (kg)
Rated charge power	0.5P (52.249kW)
Rated discharge power	0.5P (52.249kW)
Short overload charging power	1P (104.499kW) @60s
Battery operating temperature	-30~60 (°C) for discharge 0~55 (°C) for charge
IP level	IP67
Insulation standard	$\geq 1000\Omega/V$
Withstand voltage	4500VDC, leakage current $\leq 5mA$, no breakdown or flashover
Cooling and heating type	Liquid cooling / heating
Fire fighting	Hot Aerosol

3



Connected cabinets

- Grid-connected cabinet
- ATS cabinet

Grid connected cabinet

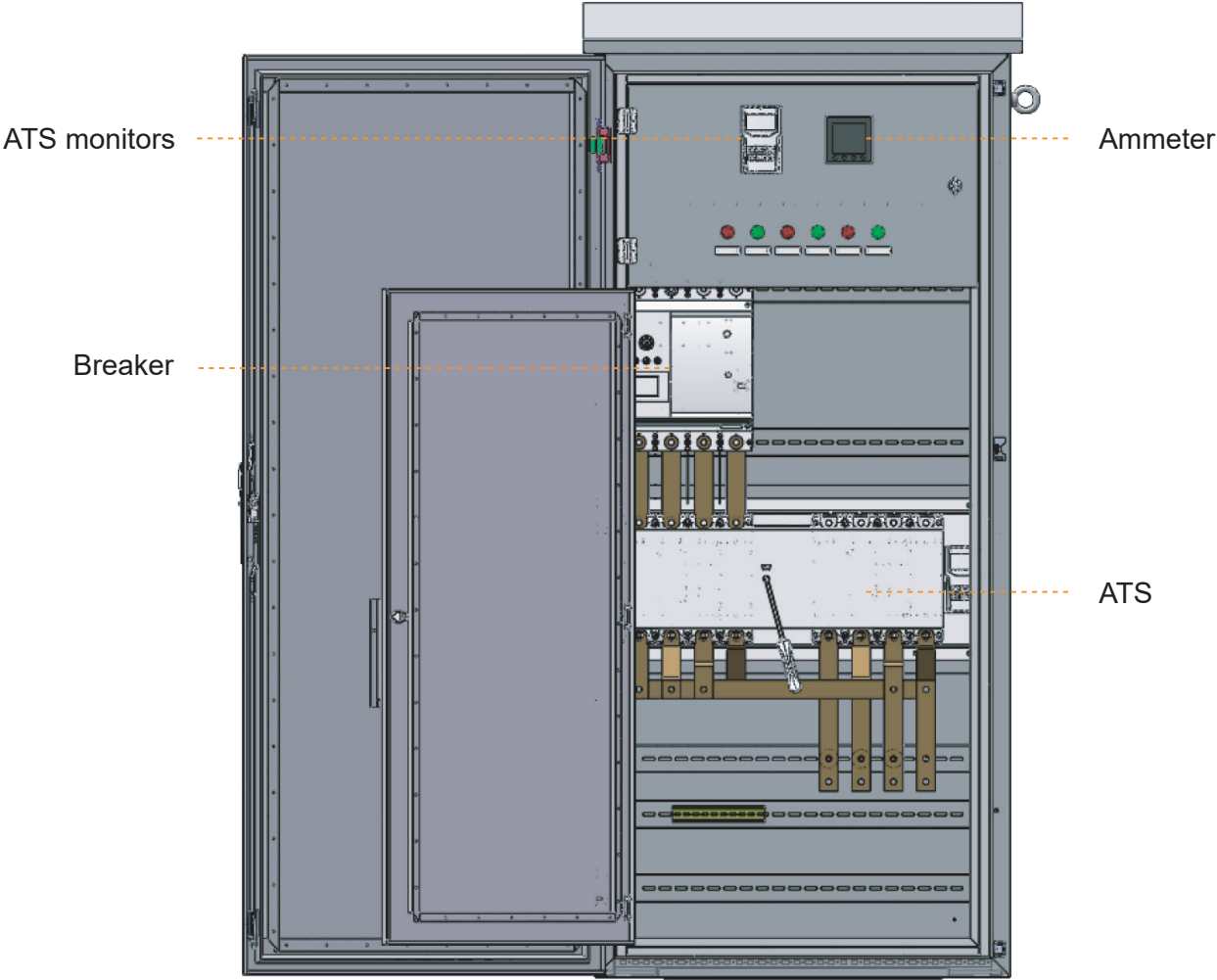


Module	Pi-GCC250	Pi-GCC500	Pi-GCC750	Pi-GCC1000	Pi-GCC1250
Rated current	250A	500A	750A	1000A	1250A
Rated Voltage	AC 400V				
Installation Location	Outdoor				
Ambient Temperature	-20°C ~ +40°C				
Relative Humidity	≤ 95%				
Elevation above sea level	≤ 2000m				
Protection level	IP54				
Rated frequency	50Hz				
Rated short-time withstand current (I _{cw})	5kA/1S				
Rated peak withstand current (I _{pk})	12kA/1S				
Power frequency withstand voltage	2500V				
Impulse withstand voltage	8kV				

ATS cabinet

System	PI-AT800	
Current Rating	800A	
Rated Operational Voltage (Ue)	AC400V 50Hz	
Rated Insulation Voltage (Ui)	AC 800V	
Rated Impulse Withstand Voltage (Uimp)	8kV	
Number of Poles	3P/4P	
Short-circuit breaking capacity code	L	M
Rated short-circuit making capacity Icm(kA)	105	154
Rated short-circuit breaking capacity Icn(kA)	50	70
Mechanical life	4000 (*)	
Electrical life	2000 (*)	
Electrical equipment level	Class CB	
Protection characteristics	Overload protection / Short-circuit protection	
Installation method	Vertical fixed installation	
Wiring method	Screw terminal connection	
Operating method	Manual / Automatic / Remote operation (with communication products)	
Protection class	IP54	
Transfer time	$2.7s \pm 10\%$	
Power-off time	$2.7s \pm 10\%$	
Control characteristics	Undervoltage, loss of voltage, overvoltage, phase failure conversion	
Controller power consumption	$\leq 10W$	
Normal operating range	85%Ue ~ 110%Ue	
Special requirements	Normal installation conditions	
Whether the product is suitable for isolation	Yes	

ATS cabinet



4

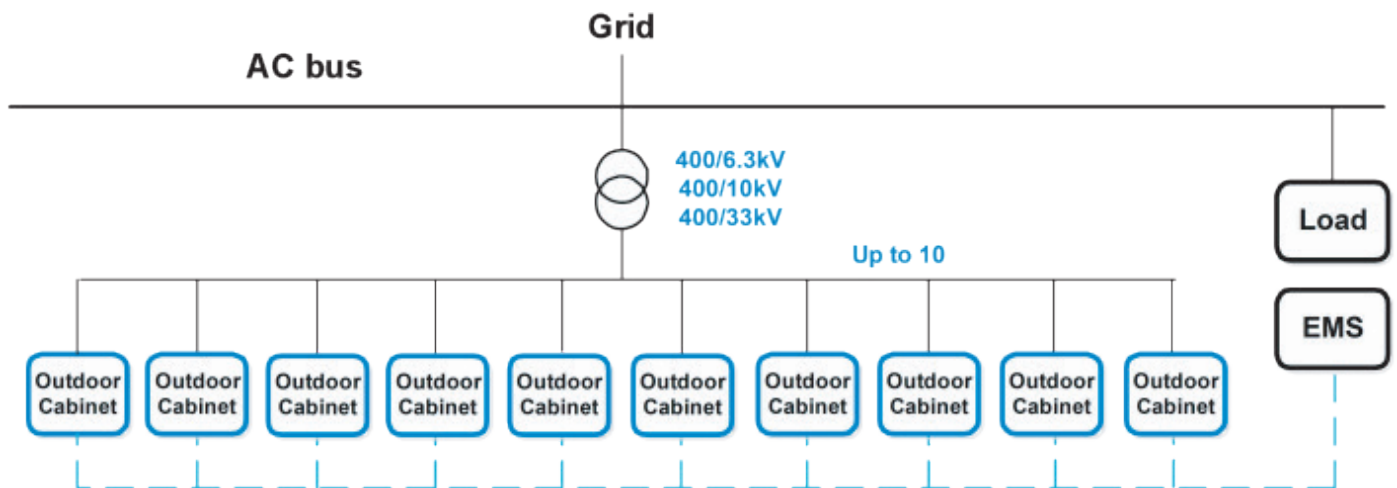


Application Diagram - ESS

- Paralleling Outdoor Cabinet BESS
- Paralleling Container BESS

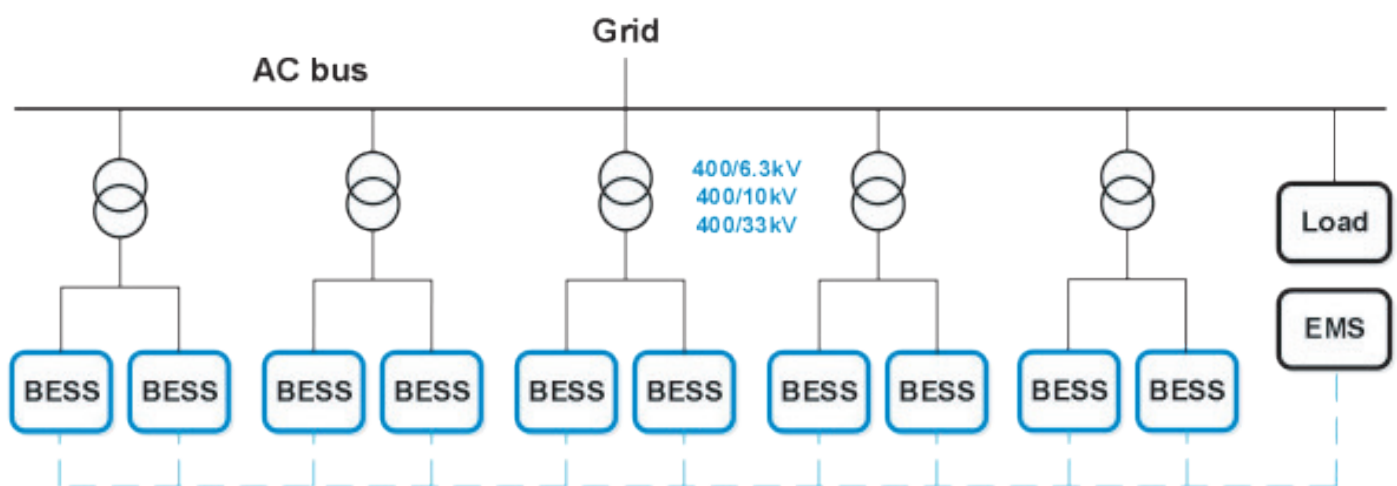
Paralleling Cabinet BESS

For larger commercial and industrial application



Paralleling Container BESS

For utility-scale application



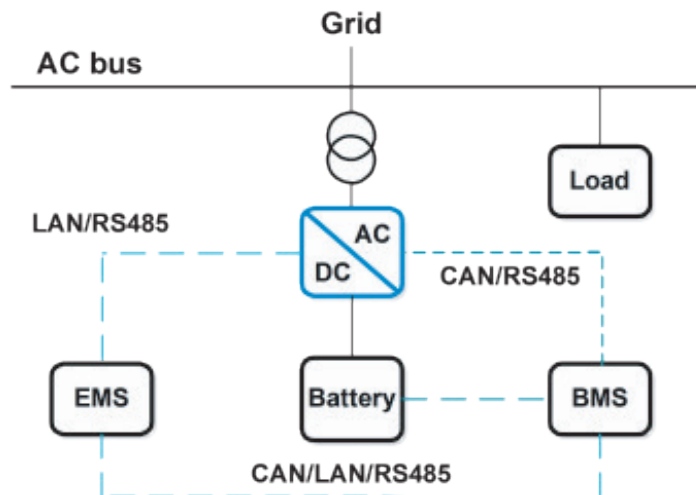
5 ▶ **Application Diagram - PCS**

- On-grid only
- Off-grid only
- On-grid with backup

On-grid Only

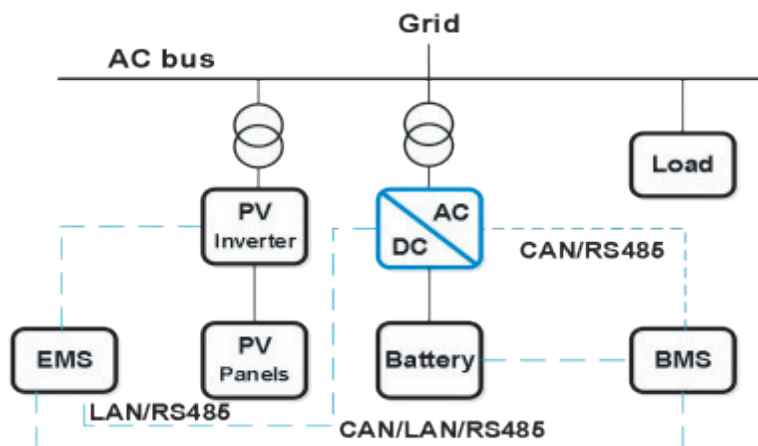
Storage-only solution

The battery is charged by grid, mainly used for peak – shaving/frequency regulation/Demand charge management.



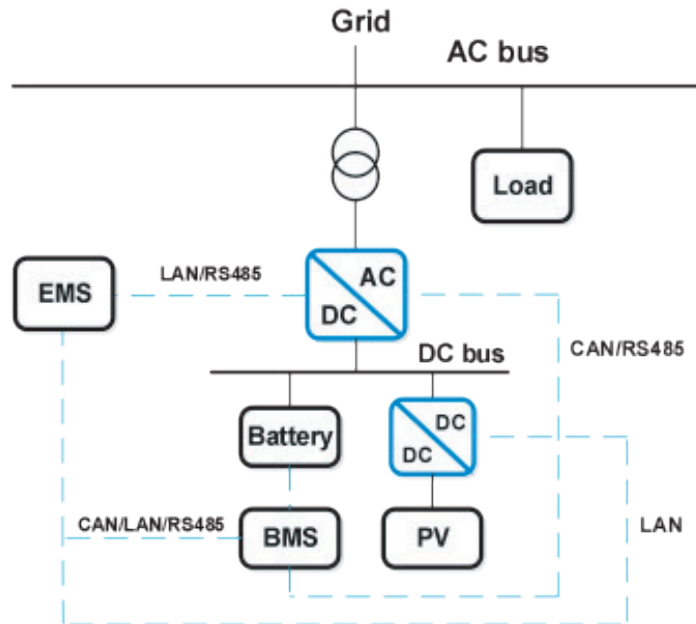
AC-coupled solution

AC coupled with PV or other power sources together with grid, mainly for maximization of self generation and zero – consumption from grid.

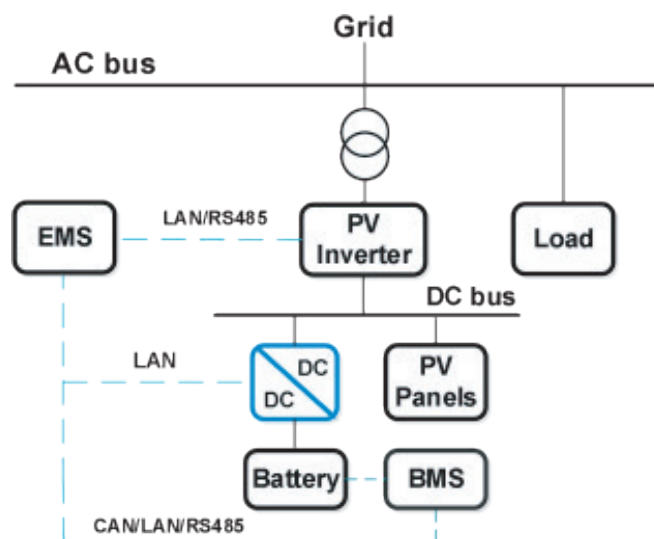


DC-coupled Solution

DC coupled with PV, mainly for self-consumption and replacement for phased-out PV inverters.

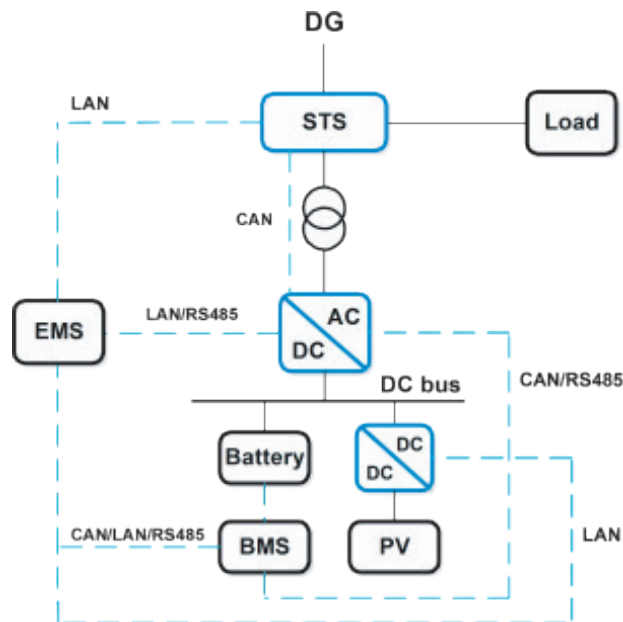


By adding DC coupled battery into existing or new-built PV farms to maximize the solar generation.



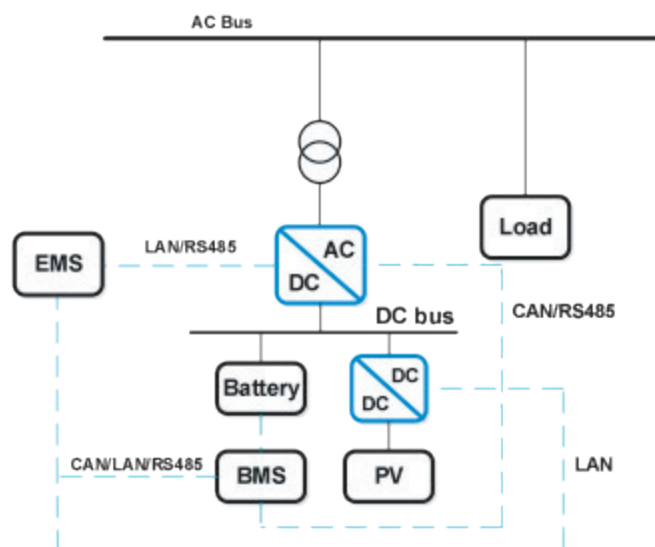
DC-coupled solution without power outage

To work with Diesel Genset In remote areas as main powersource for loads. DC coupled PV farm is charging battery when necessary. DG is been treated as back-up only.



DC-coupled solution with external EMS controls only

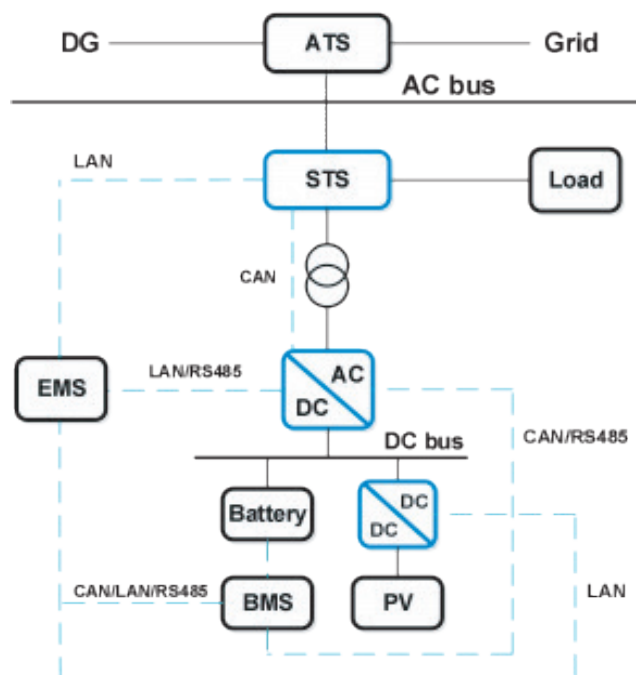
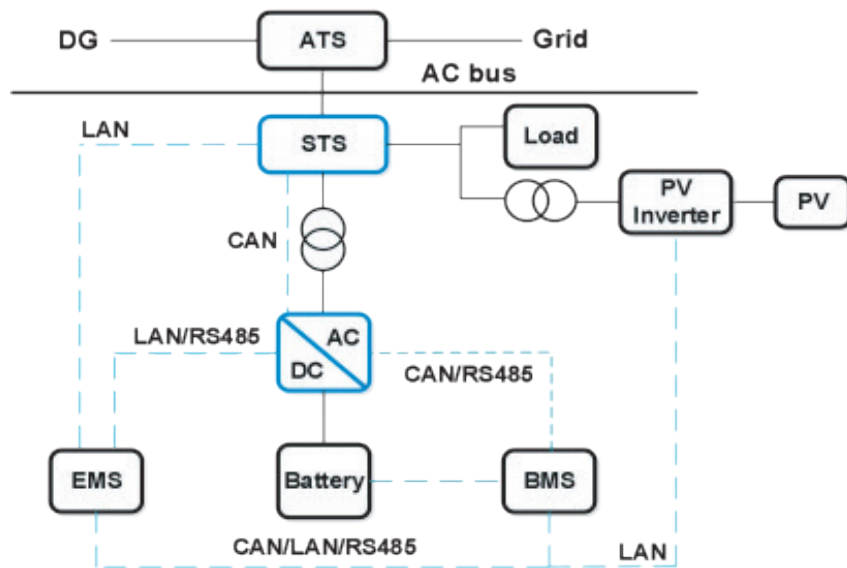
To work with DC coupled PV panels as main voltage source. External EMS could command PCS to follow external AC source when battery runs out with signals from external ATS.



On-grid with Back-up

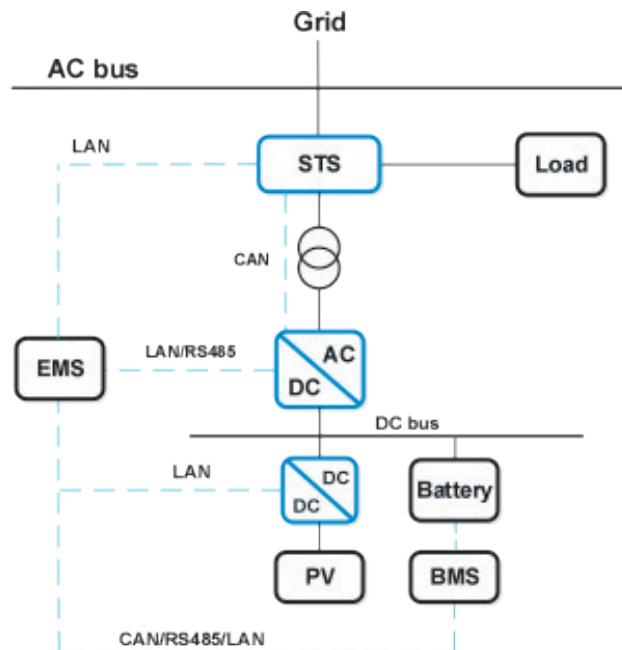
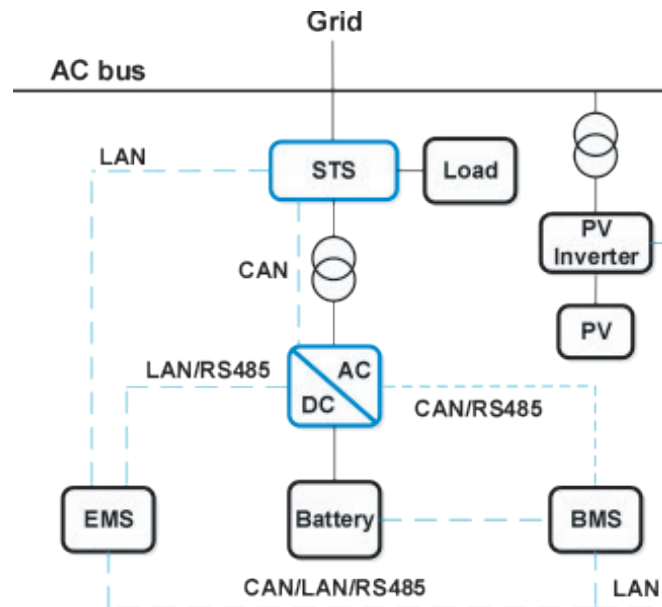
AC-coupled & DC-coupled solution with Generator

Work with AC or DC coupled PV farm, BESS can automatically act as backup power for loads when grid fails. DG will be acting as secondary back-up when both battery and solar energy runs out.



AC-coupled & DC-coupled solution w/o Generator

Work with or without DC coupled PV farm, BESS can automatically act as backup power for loads when grid fails. But loads will shut down if battery and solar runs out and grid fails.



6



Product Application Diagram

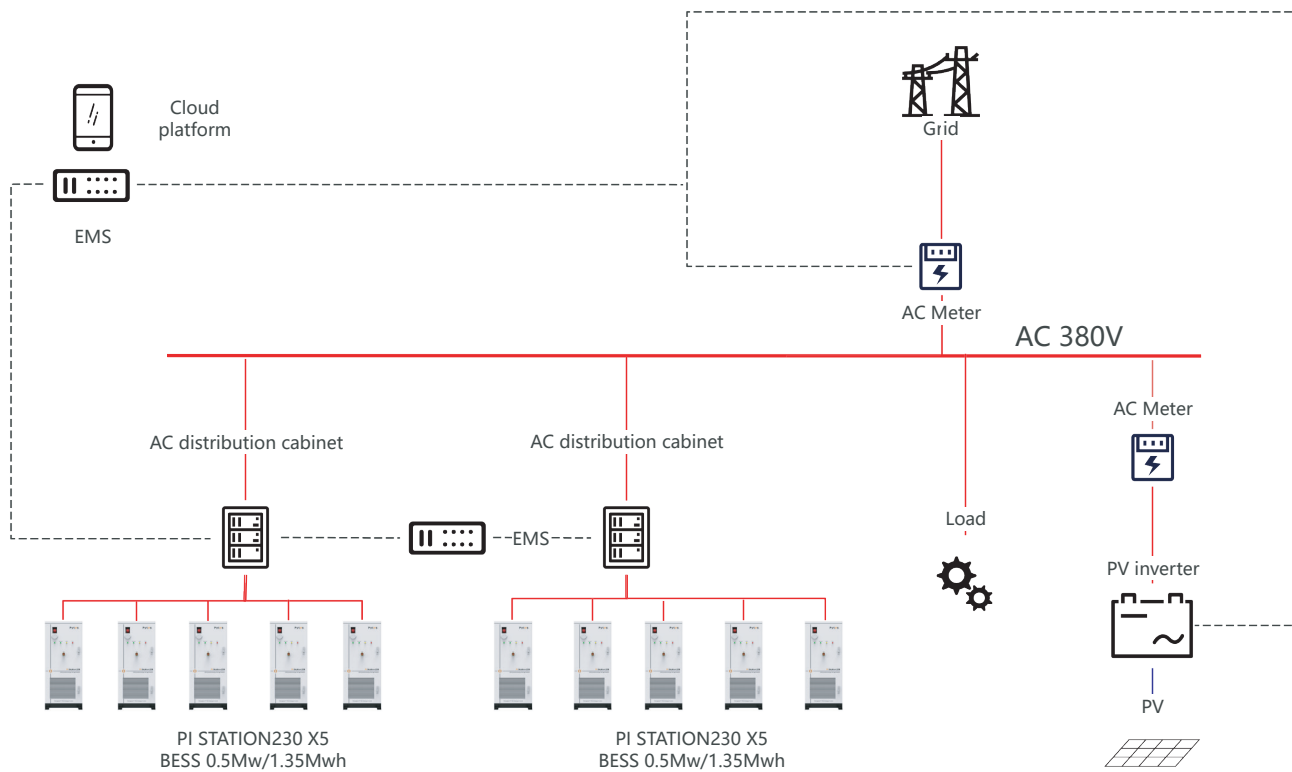
- Paralleling PI STATION 230EX
- Paralleling HV 48300-CE
- Paralleling HV 48300-UL
- Paralleling PI STATION 417
- Paralleling PI CUBE 5MWh

PI STATION 230EX

Paralleling Pi Station 230EX On Grid

Debugging of PV inverters and utilization
of PV surplus electricity

— DC
— AC
- - - - - Communication

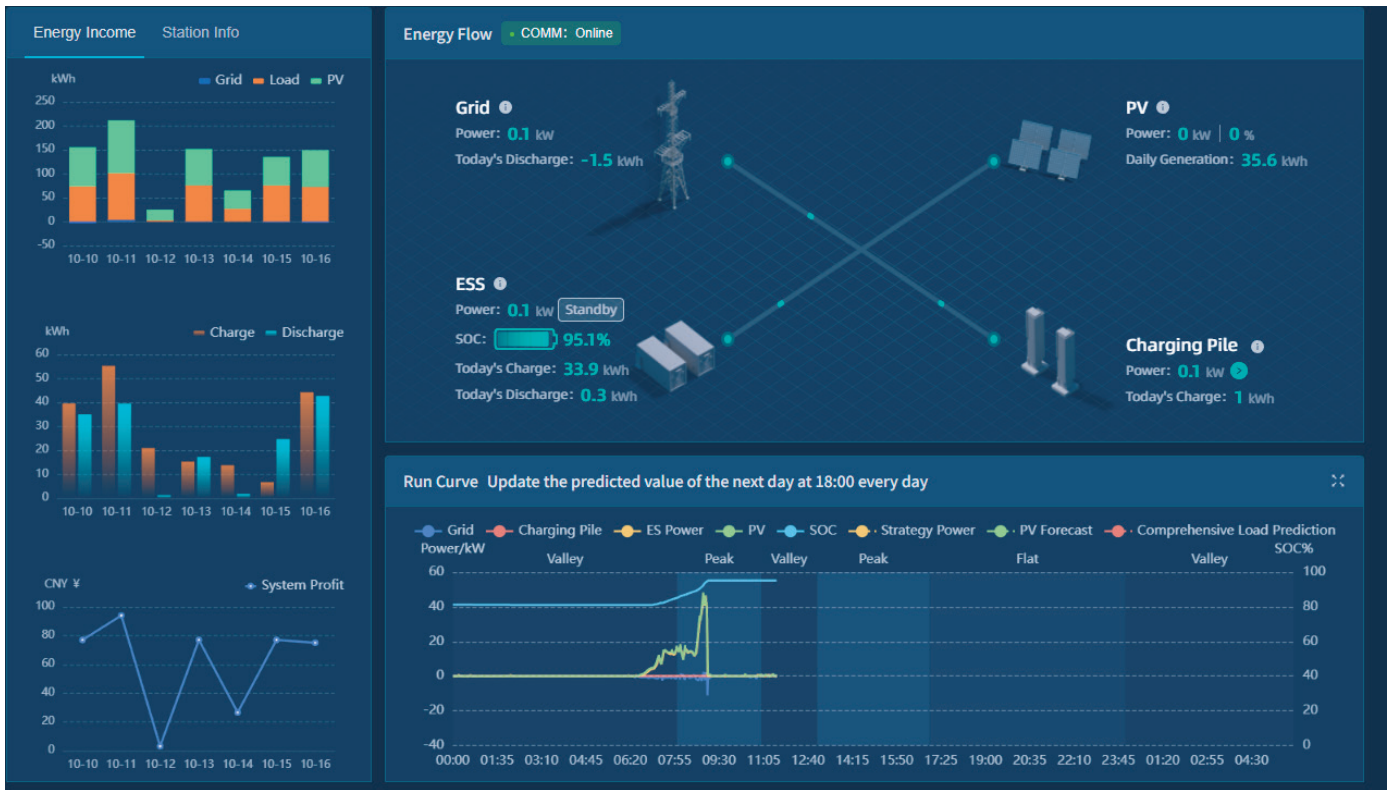


Pytes can provide materials in this system

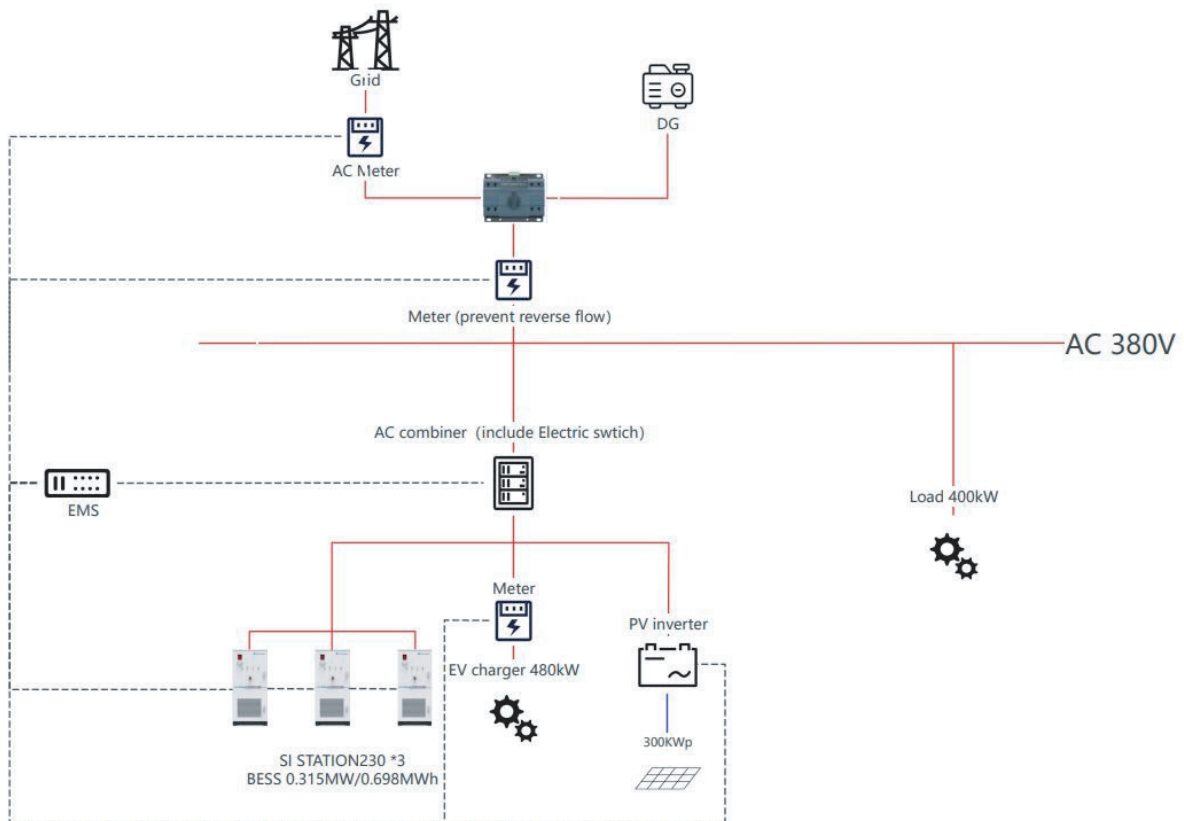
Project	Specifications
PI Station 230EX	105kW/232.96kWh
AC distrubution cabinet	250A/500A/750A/1000A/1250A
EMS	/
Ammeter	/
Cureent transformer	/

PI STATION 230EX

EMS(Grid+PV+PI STATION 230EX+EV Charging Station)

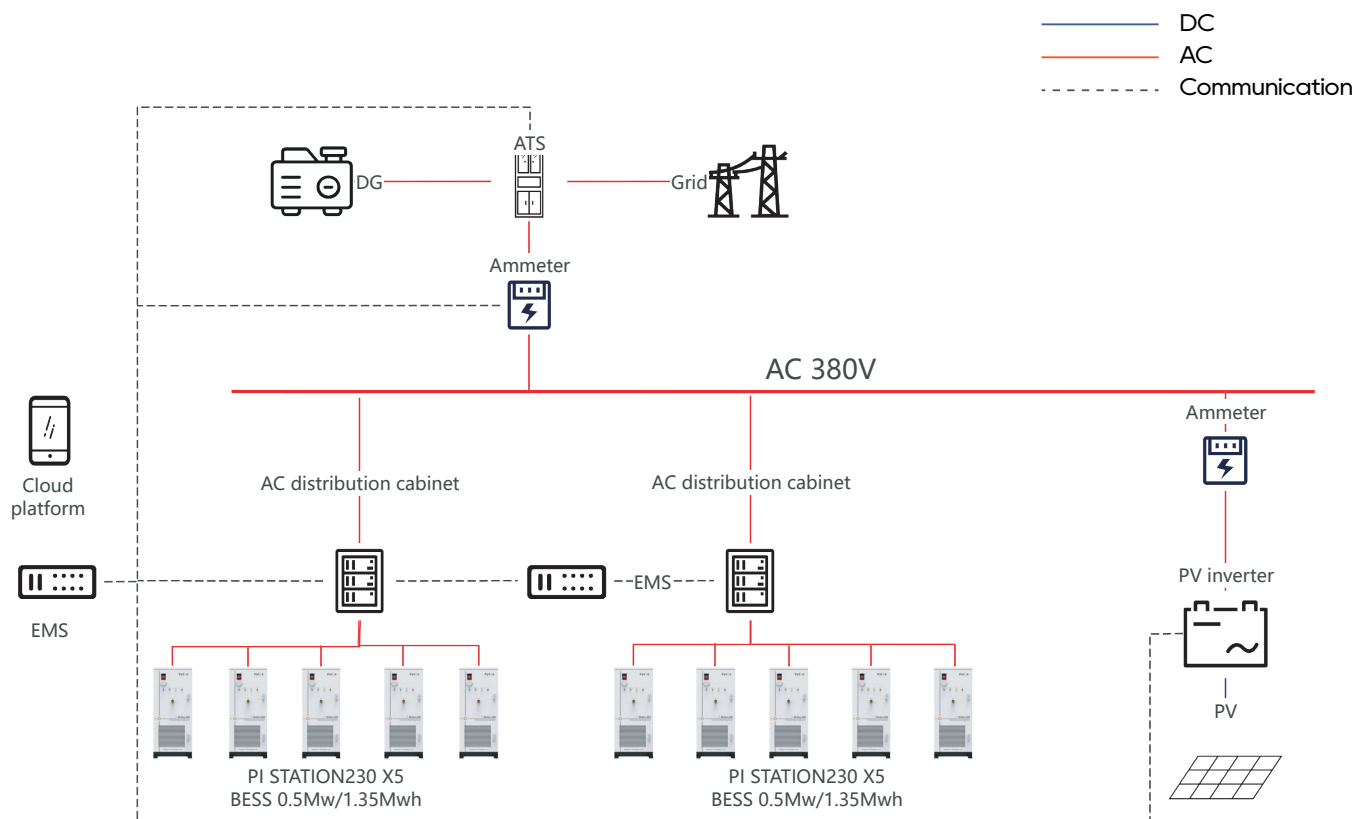


layout sketch



PI STATION 230EX

Paralleling PI STATION 230EX (Switch off Grid)



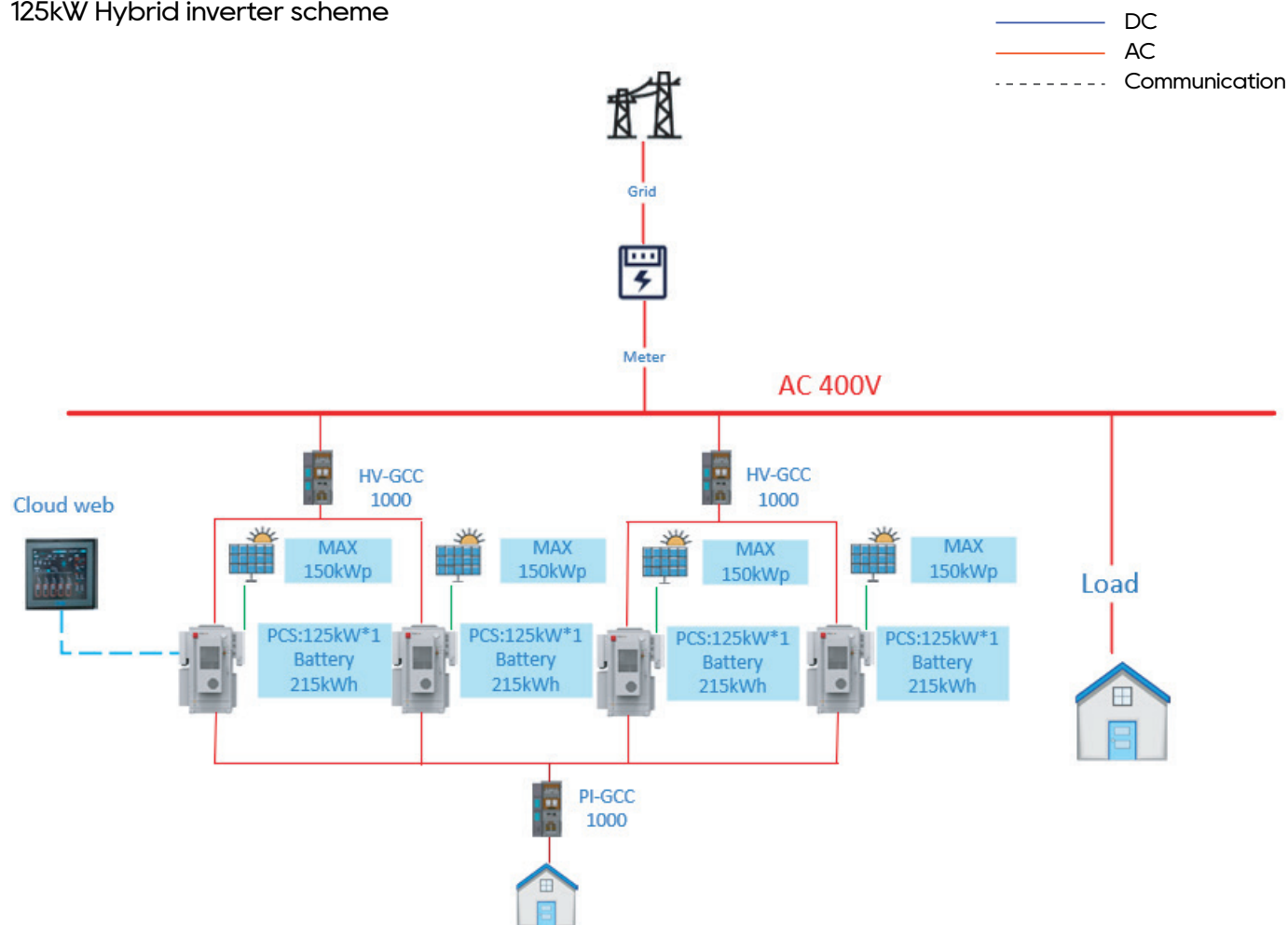
Pytes can provide materials in this system

Project	Specifications
PI Station 230EX	105kW/232.96kWh
AC distrubution cabinet	250A/500A/750A/1000A/1250A
EMS	/
ATS cabinet	800A/1600A
Ammeter	/
Curent transformer	/

HV48300CE-125kW

Paralleling HV48300-CE

125kW Hybrid inverter scheme



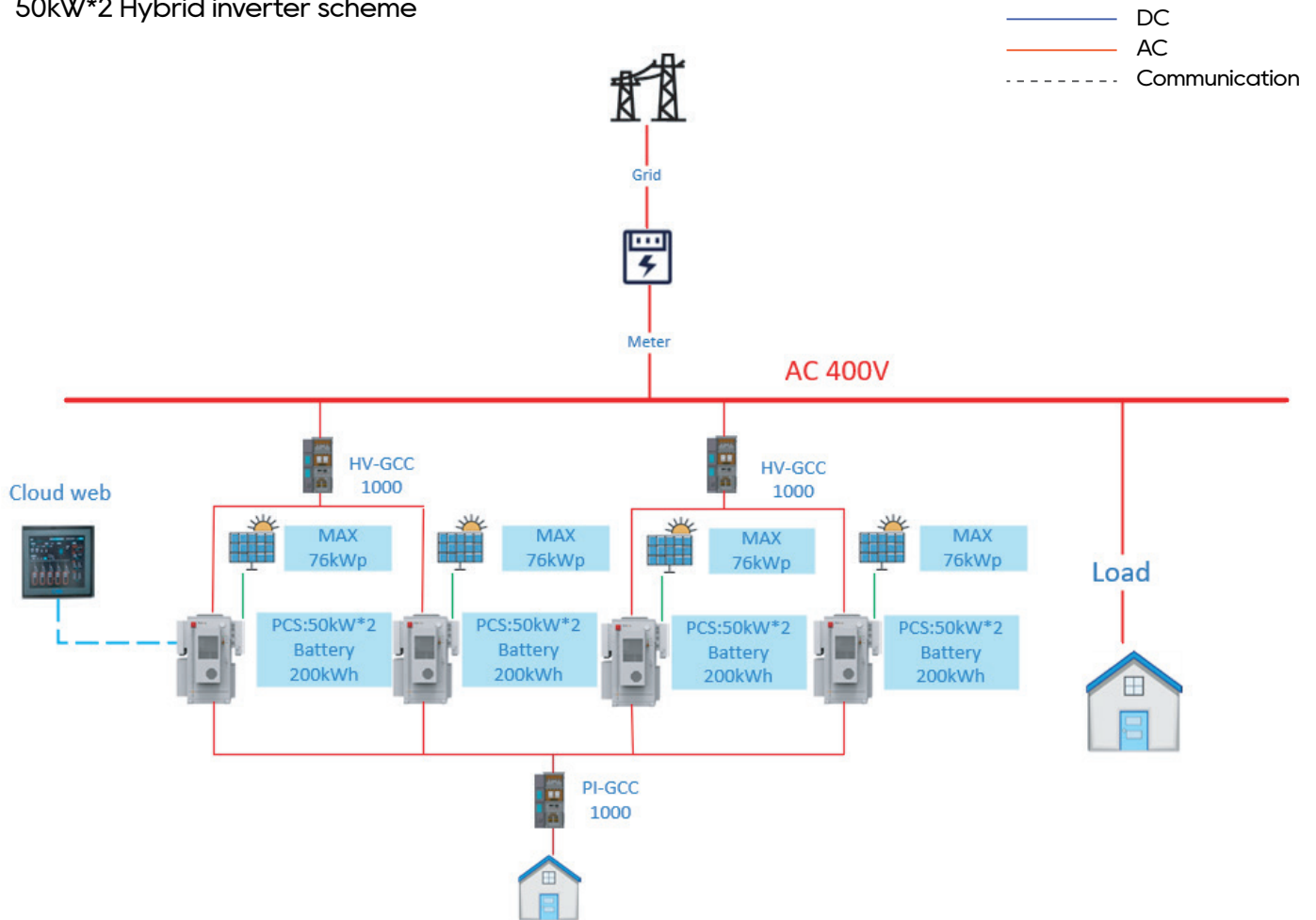
Pytes can provide materials in this system

Project	Specifications
HV48300-CE	125kW/215.04kWh
AC distrubution cabinet	500A/1000A/1500A/2000A
Ammeter	/
Cureent transformer	/

HV48300UL-100kW

Paralleling HV48300-UL

50kW*2 Hybrid inverter scheme

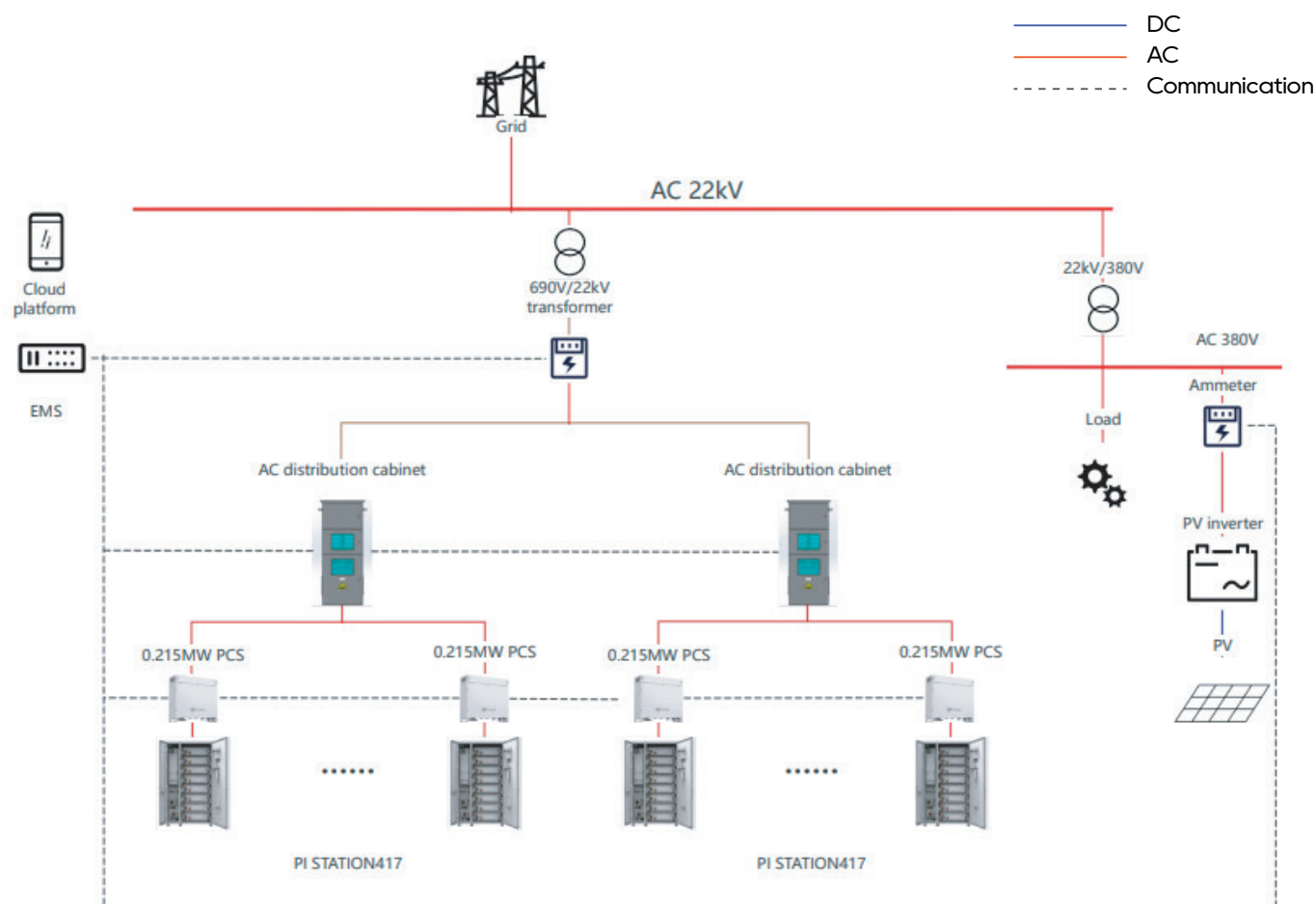


Pytes can provide materials in this system

Project	Specifications
HV48300-UL	100kW/200.70kWh
AC distrubution cabinet	500A/1000A/1500A/2000A
EMS	/
Ammeter	/
Cureent transformer	/

PI STATION 417

Paralleling PI STATION 417 On Grid (High voltage)

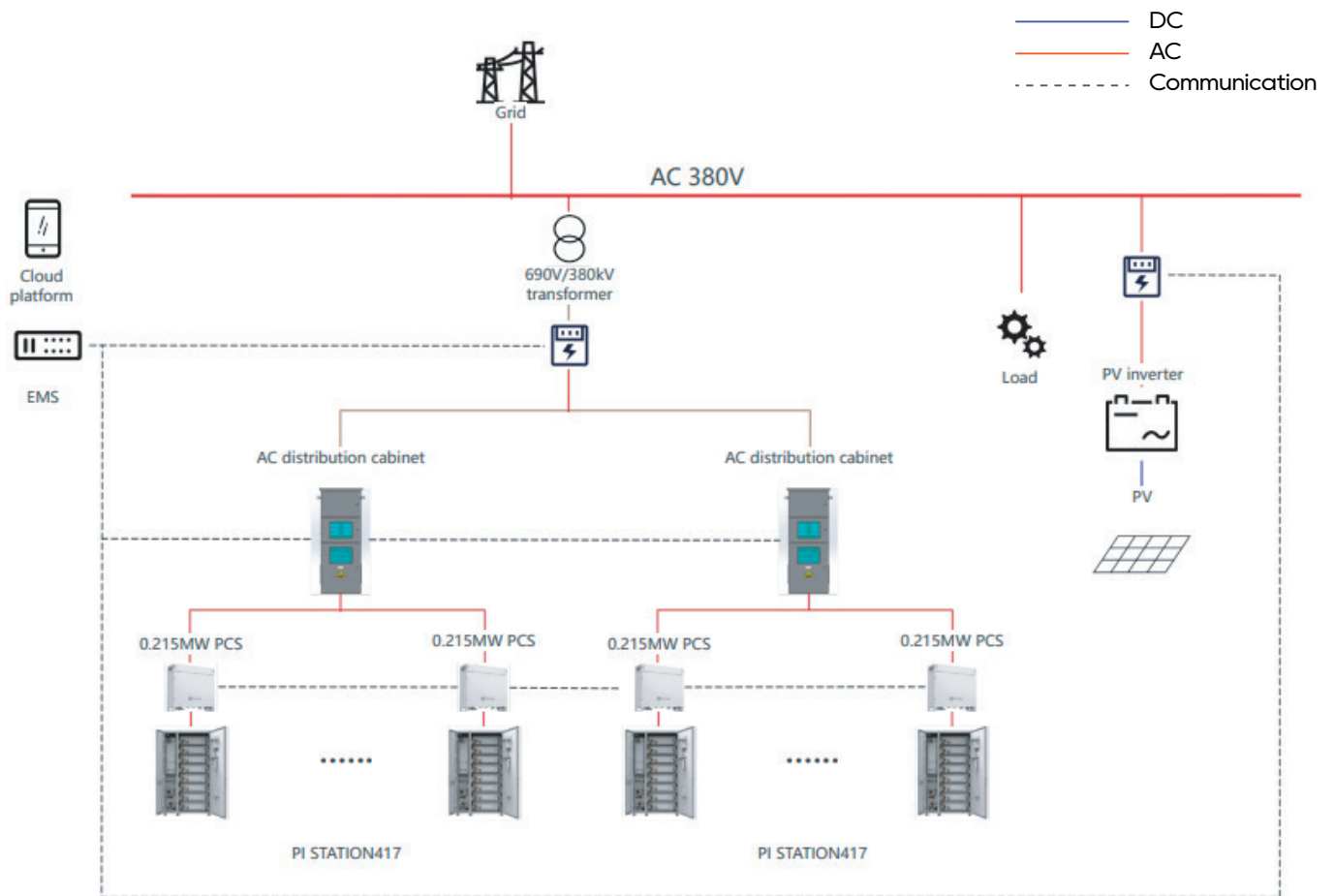


Pytes can provide materials in this system

Project	Specifications
PI Station 417	417.99kWh
PCS	215kW
AC distrubution cabinet	250A/500A/750A/1000A/1250A
EMS	/
Ammeter	/
Cureent transformer	/

PI STATION 417

Paralleling PI STATION 417 On Grid (Low voltage)

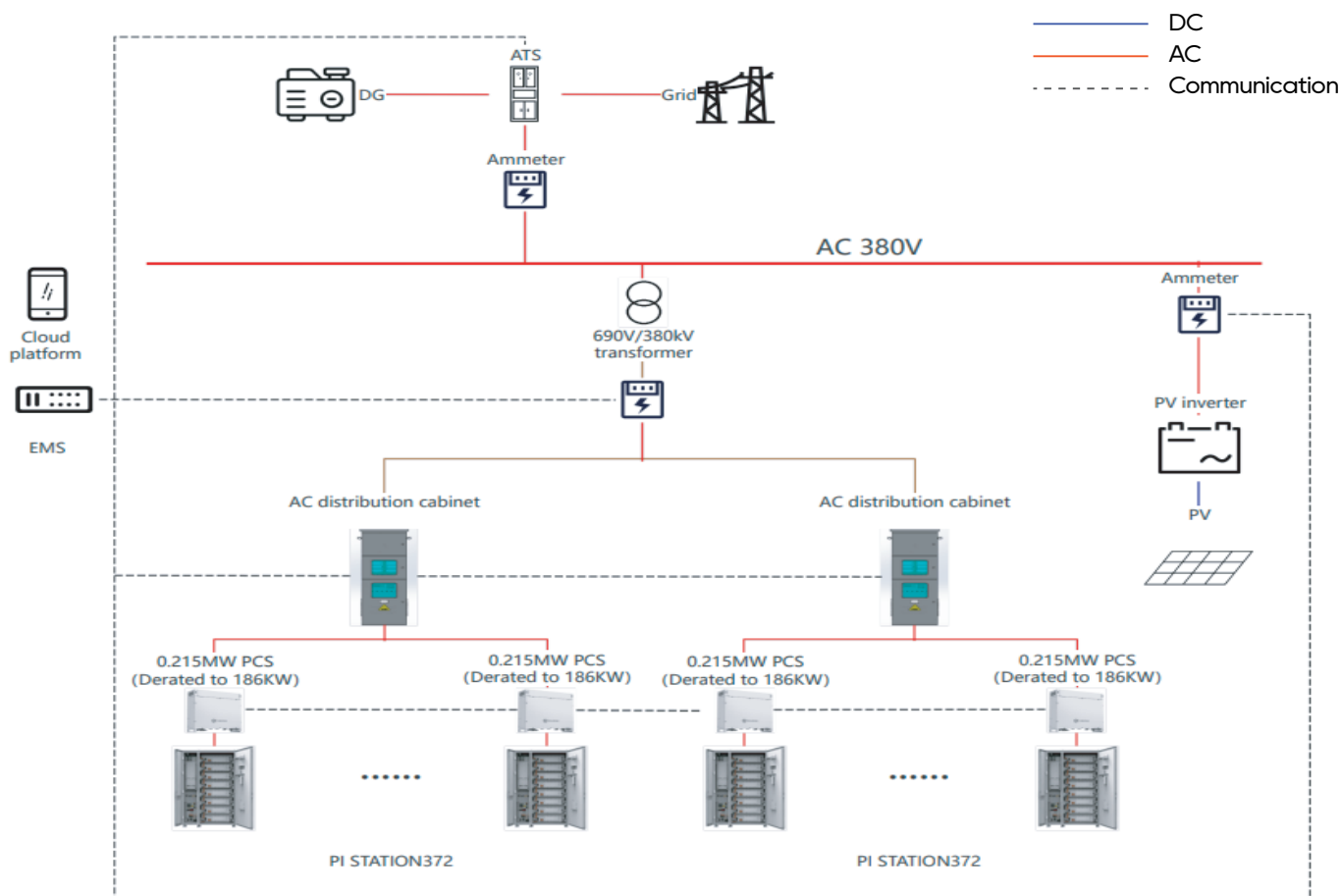


Pytes can provide materials in this system

Project	Specifications
PI Station 417	417.99kWh
PCS	215kW
AC distrubution cabinet	250A/500A/750A/1000A/1250A
EMS	/
Ammeter	/
Cureent transformer	/

PI STATION 417

Paralleling PI STATION 417 Off Grid

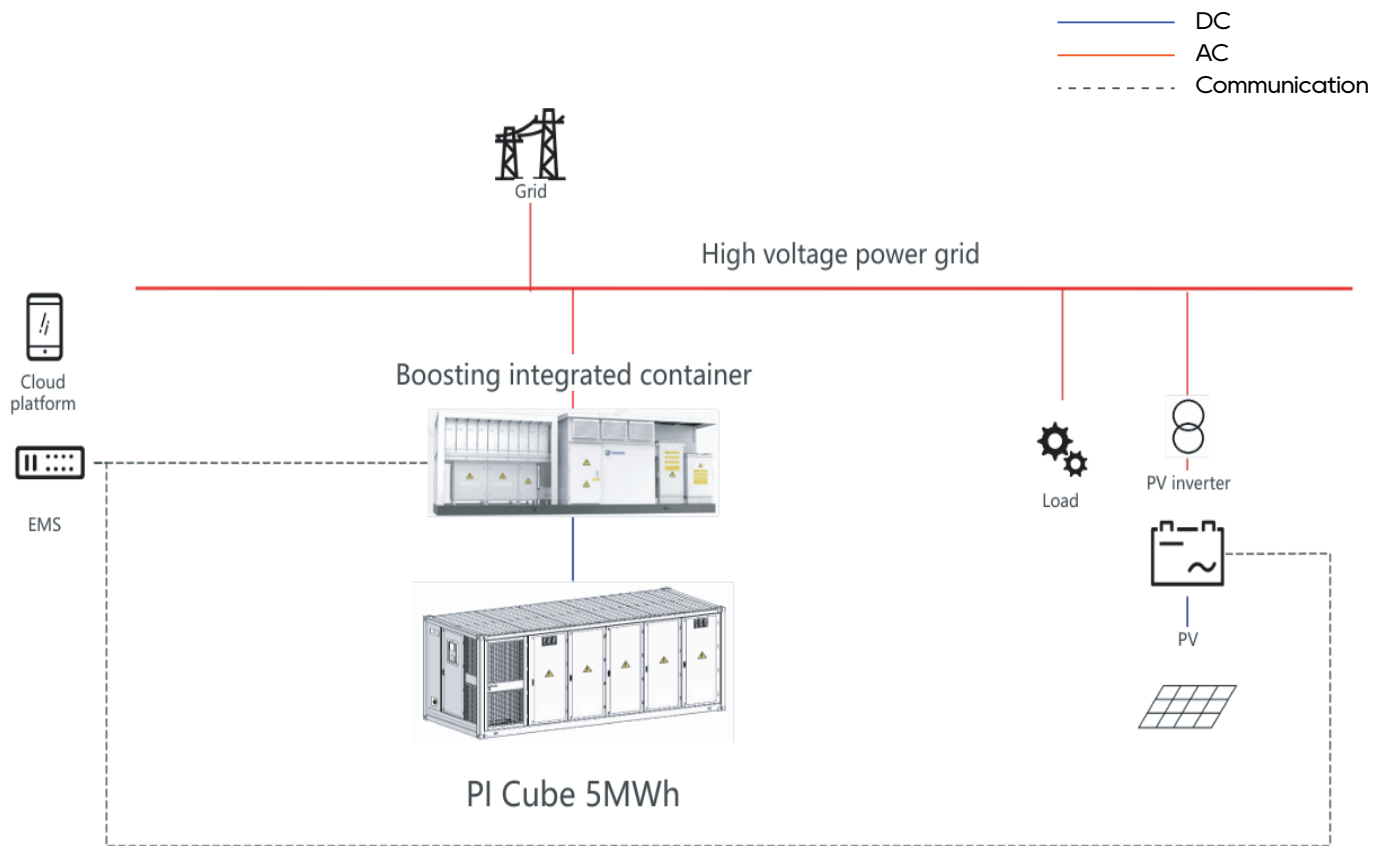


Pytes can provide materials in this system

Project	Specifications
PI Station 417	417.99kWh
PCS	215kW
AC distrubution cabinet	250A/500A/750A/1000A/1250A
EMS	/
ATS cabinet	800A/1600A
Ammeter	/
Cureent transformer	/

PI CUBE 5MWh

PI CUBE + String PCS

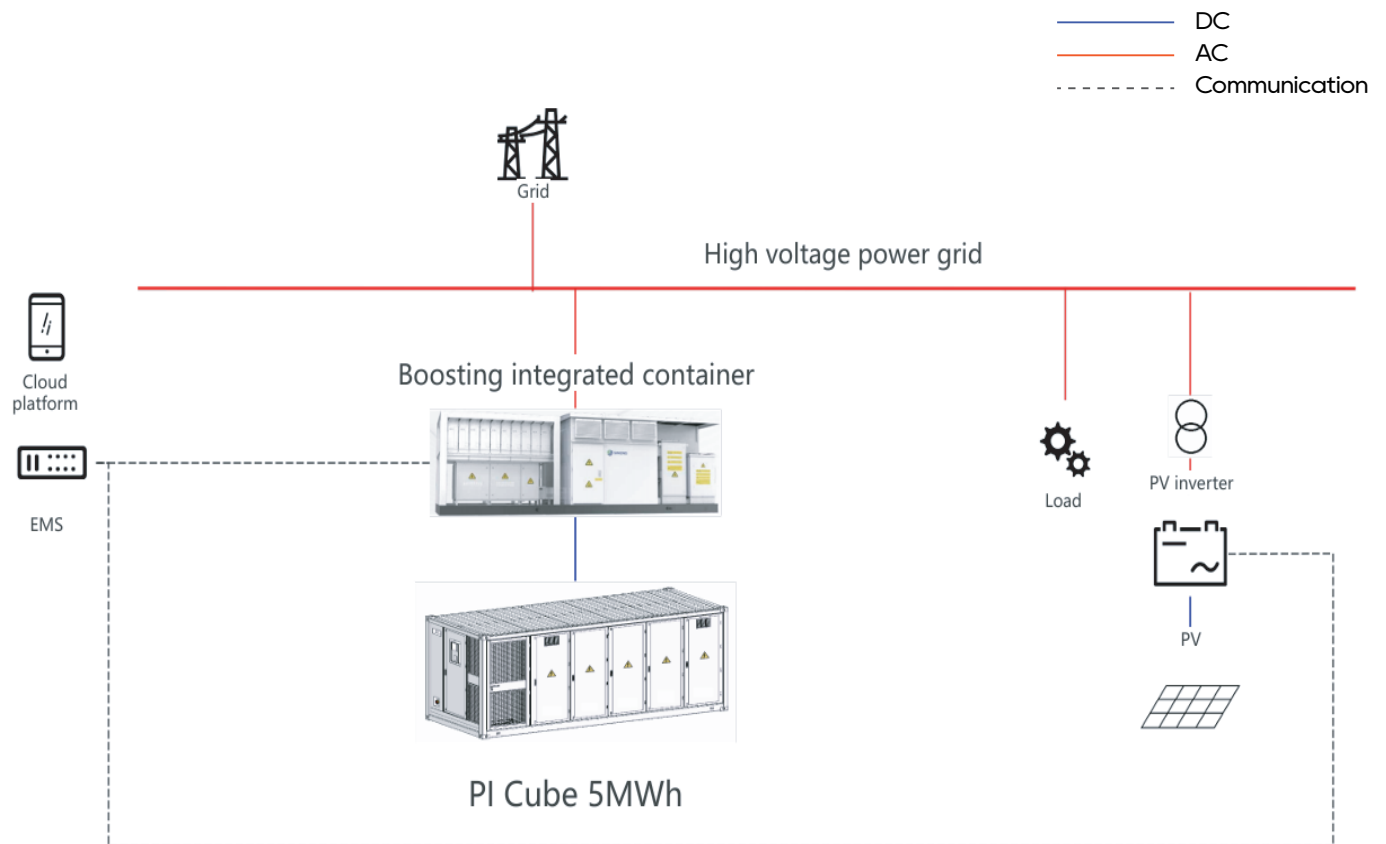


Pi CUBE + String PCS

Project	Specifications
PI CUBE 5MWh	5015.9kWh
Boosting integrated container (String PCS+Transformer)	215*12 kW
EMS	/
Ammeter	/
Curent transformer	/

PI CUBE 5MWh

PI CUBE + Centralized PCS



PI CUBE + Centralized PCS

Project	Specifications
PI CUBE 5MWh	5015.9kWh
Boosting integrated container (Centralized PCS+Transformer)	2.5MW
EMS	/
Ammeter	/
Curent transformer	/



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