

---

# KAC50DP/BC100DE Product Introduction

---



## **PART 01**

# **KSTAR Company Profile**

Powering Green Future

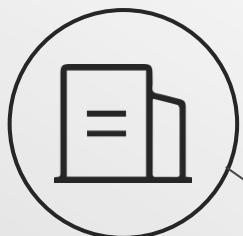
# Company **Profile**

Founded in 1993, Shenzhen KSTAR Science & Technology Co., Ltd is a pioneer of UPS industry and a total solution provider for Data Center Critical Infrastructure & PV Inverter Systems worldwide.

KSTAR has been providing high-quality products to over 90 countries and regions worldwide, leading the industrial development with innovation.

With a floor area of 150,000 square meters and a building area of 167,000 square meters, KSTAR R&D and manufacturing base is a world-leading base in terms of scale and manufacturing capabilities.

# KSTAR Development history of the company



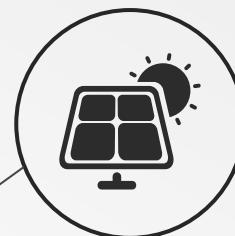
## 1993 Company Established

- 1993 Offline UPS
- 1995 Low-power Online UPS
- 1996 Entering the European & US markets



## 2000 Guanlan Industrial Park, Shenzhen

- Medium-power Online UPS
- 2001 Storage Battery
- 2004 High-power Online UPS
- 2005 IDC Integrated System
- 2008 Certified as National Hi-Tech Enterprise & DC Power



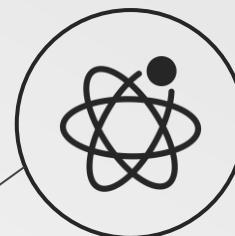
## 2009 Zhongkai Industrial Park, Huizhou

- 2009 PV Inverter
- 2009 Establish 1st PV Inverter



## 2010 Listed in Shenzhen Stock Exchange

- 2013 Opened Guangming Industrial Park, Shenzhen
- 2013 EV Charger
- 2014 ESS Products



## 2019 Established CATL KSTAR JV

- 2015 National Enterprise Technical Center
- 2018 JiangXi ChangXin factory for energy storage product

# Development Milestone

Global Office and Service center



- 18 Overseas Branch
- 40 Overseas Service Engineers
- Global Service Network
- 24/7 Response and Support

**PART 02**

## **C&I Energy Storage Solution**

Powering Green Future

# KSTAR 50KW/100kWh outdoor all-in-one ESS Solution



KAC50DP-BC100DE

## Highlights:

### Safe&Reliable

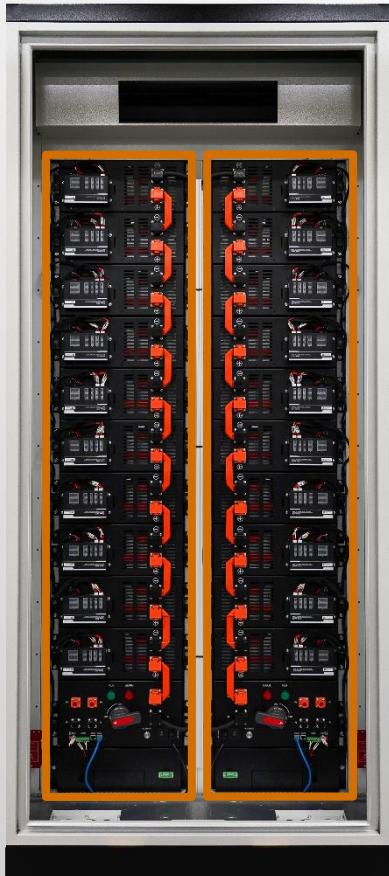
- **CATL LFP** battery cell
- Double fire suppression system design
- 1+1 redundancy design

### Simple&User-friendly

- Pre-installed in factory for easy installation on site
- **Integrated EMS**, suitable for various applications
- Effortless operation, cloud control

# Solution Description

Built-in EMS with could control interface , fitted with BMS of 1+1 redundancy design



- **1+1 redundancy design**
- Better cooperation between BMS and EMS
- Quicker response with less communication distance
- Attentive protection function

User friendly EMS design with multiple work mode

7 inches EMS screen with simple operation

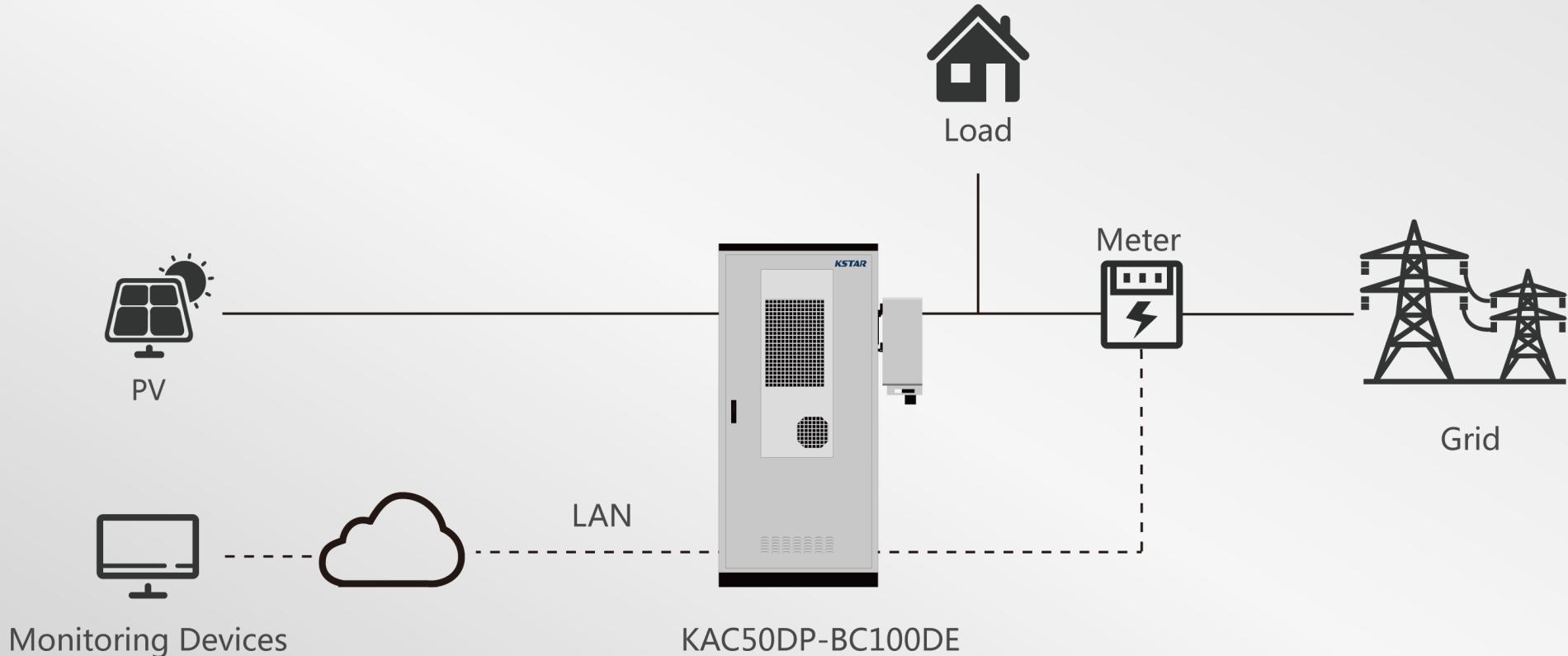
More reliable communication with less risks of external affects

Provide third party communication interface for upper level monitoring and control



# System Application

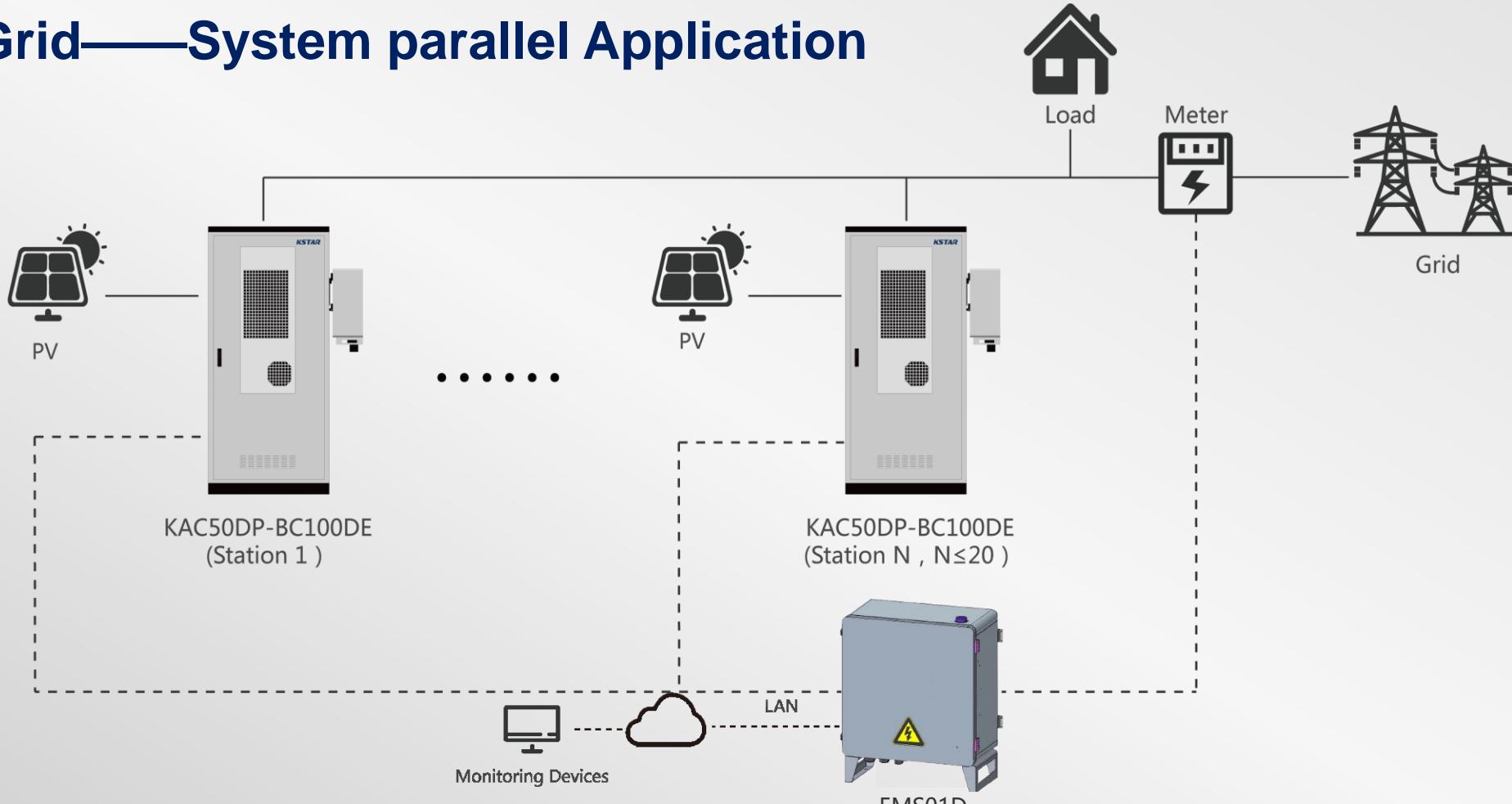
## ➤ On-Grid——Single System Application



The system can be expanded to **50KW/200KWH**

# System Application

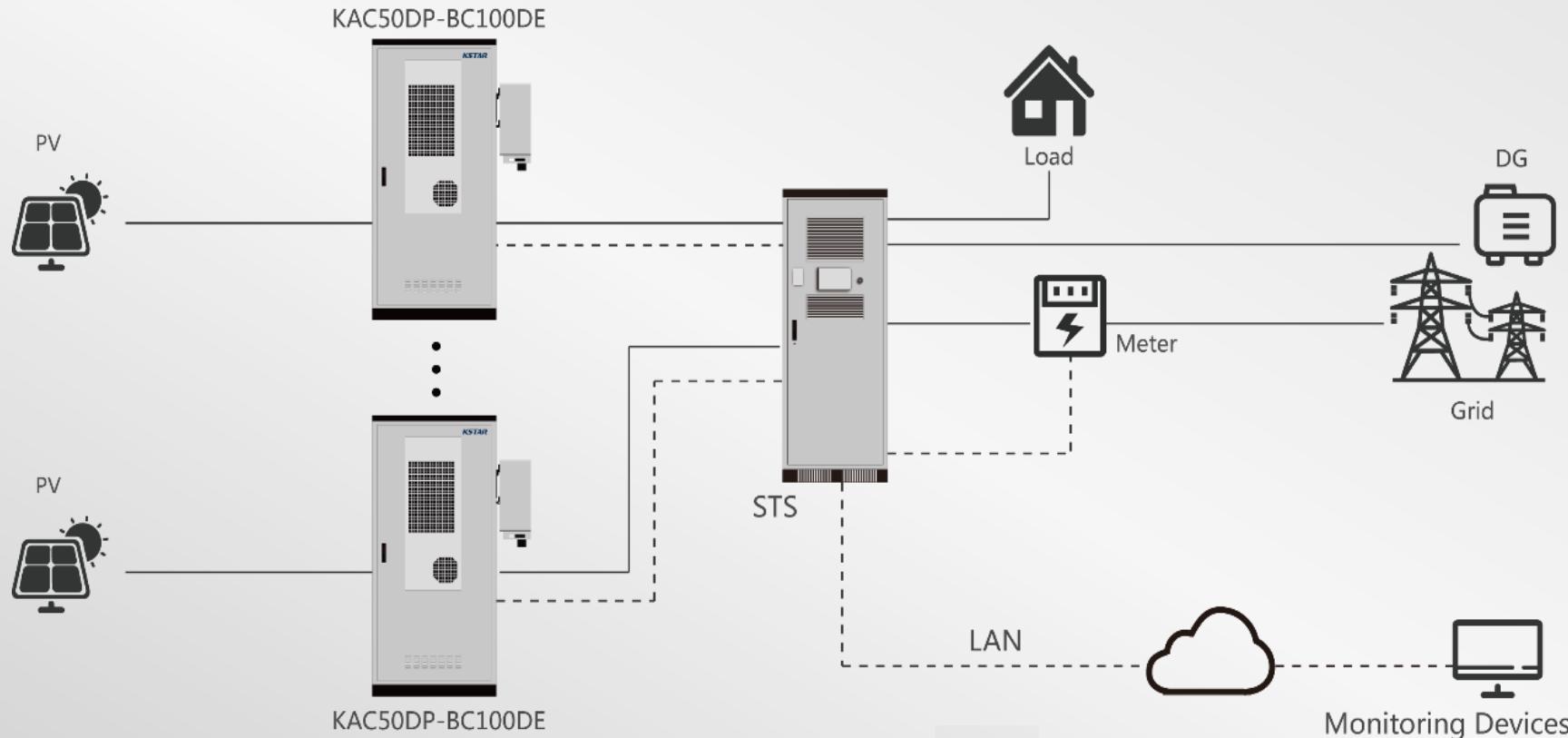
## ➤ On-Grid——System parallel Application



The system can be expanded to 1MW/2MWH (4MWH)

# System Application

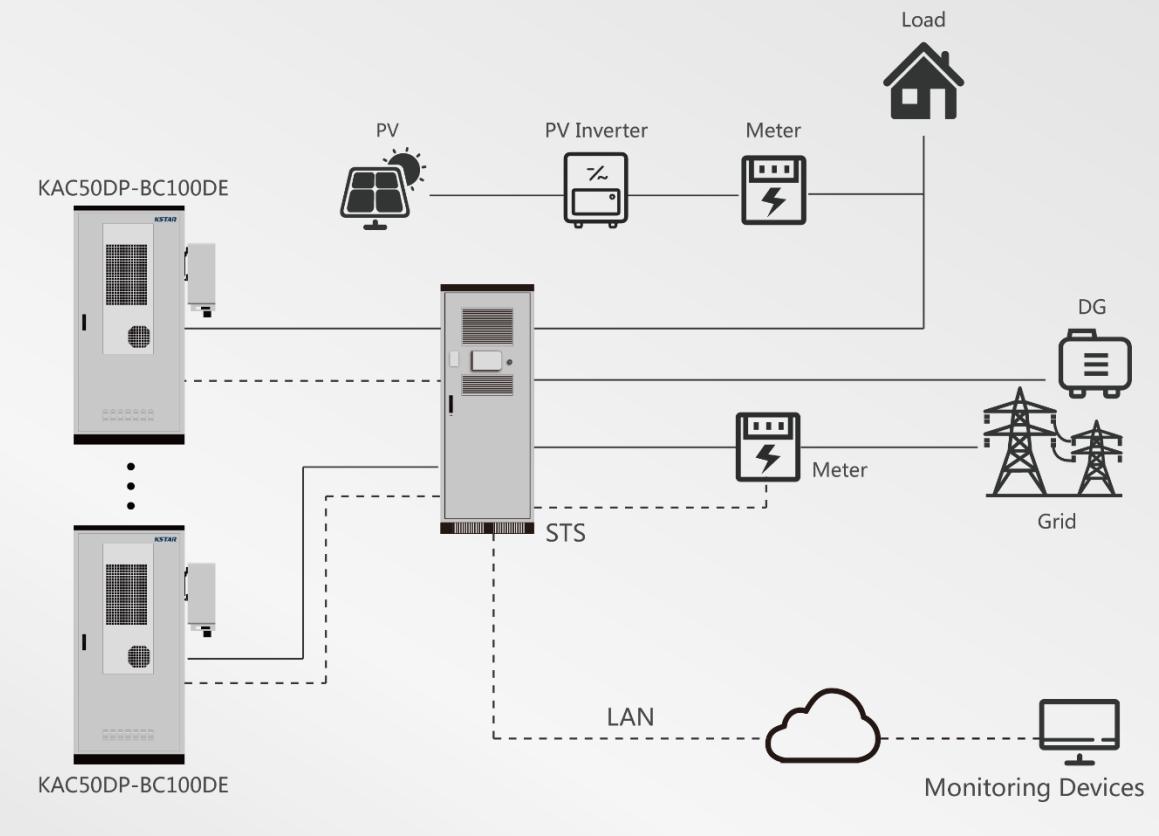
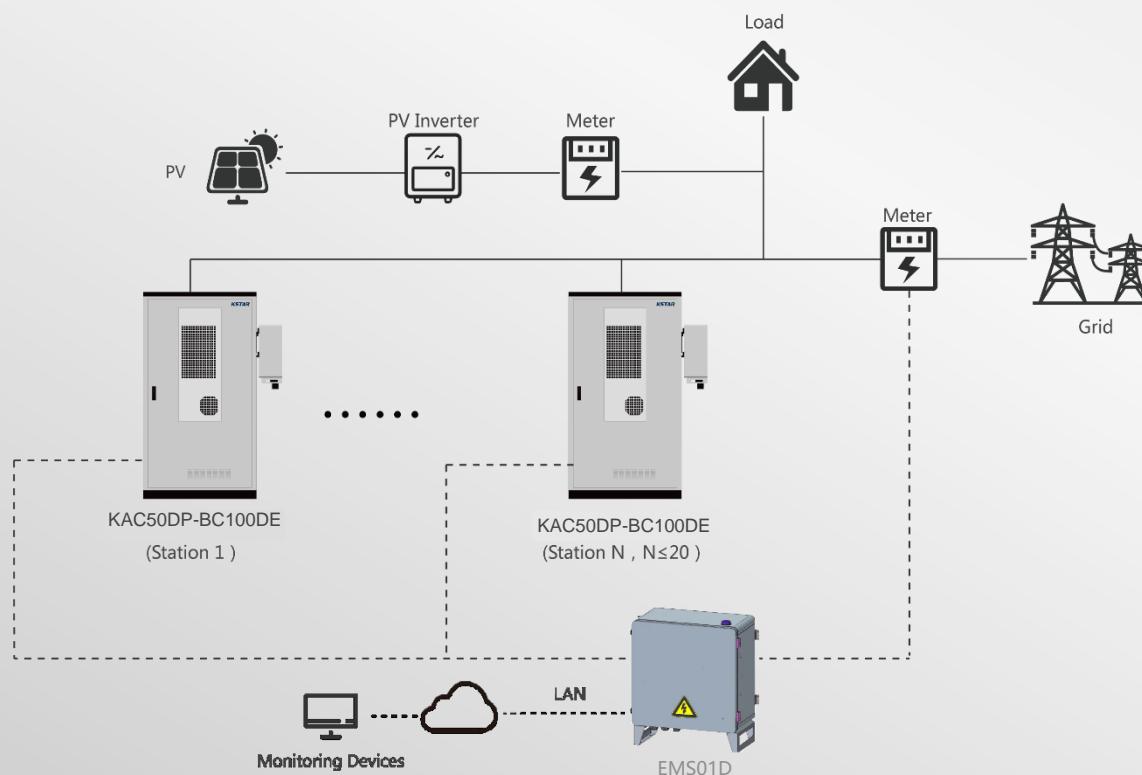
## ➤ Backup Application



The system can be expanded to **250kW/500KWH(1MWH)**

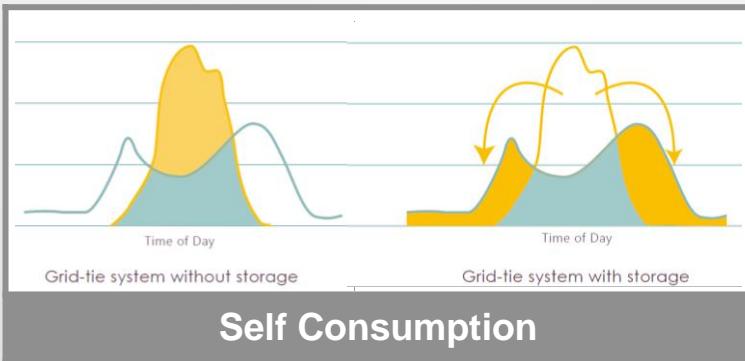
# System Application

## ➤ AC coupling Application



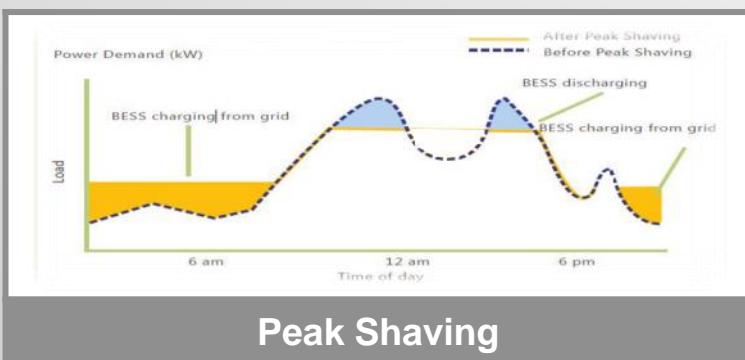
# Flexible work mode

ToU, Peak shaving, Self-consumption enabled by built-in local controller



**Strategy:** PV generation meets the demand of the loads in priority, and the excessive PV power will be stored for later use.

**Purpose:** Cut electricity bill by minimizing the energy consumption from the grid.

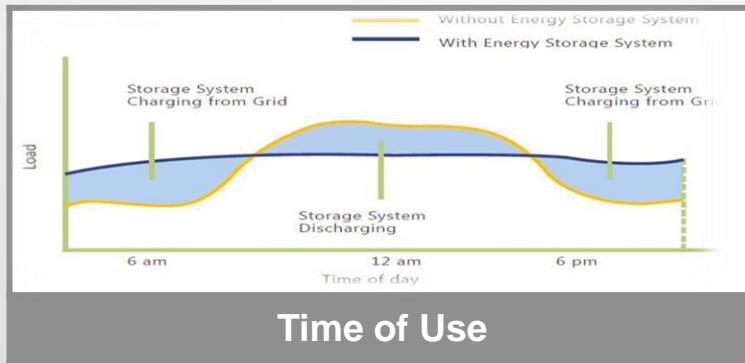


**Strategy:** When the power extracted from the grid falls outside the peak/valley range, the battery start to discharge/charge.

**Purpose:** Avoid extra charge caused by extreme high demand and make good use of power capacity contracted with DNO/DSO.

# Flexible work mode

ToU, Peak shaving, Self-consumption enabled by built-in local controller



**Strategy:** Preset a time schedule for the system to charge and discharge with selectable time range and power ratings

**Purpose:** Make good user of electricity arbitrage to minimize the unit electricity price

# BACKUP

**Battery Priority**

**Strategy:** PV generation and Grid meet the demand of battery charging; Battery discharges only after grid failure.

**Purpose:** Ensure the longer backup operation time and reliable power source.



## **PART 03**

# **C&I ESS Highlights**

Powering Green Future

# Technical feature overview

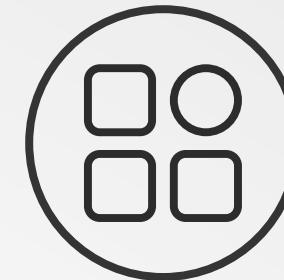
KAC50DP/BC100DE



**Safety**

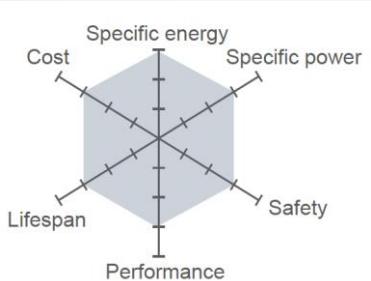


**User friendly**



**Multifunctional**

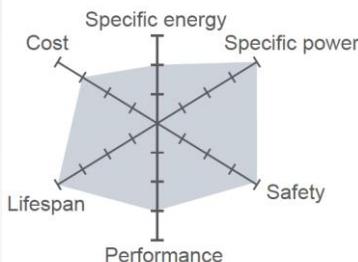
# Safety , Reliability, Long life of CATL Cell



**NCM**

- Unstable crystal structure
- Thermal runaway temp.: 200°C

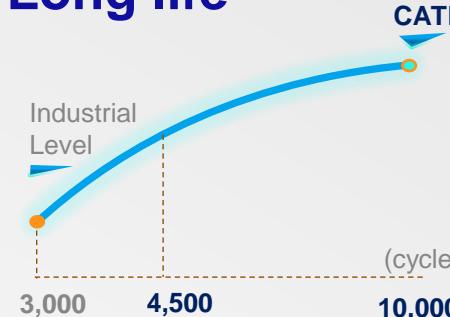
**Safety 1**



**LFP**

- Stable bond
- Thermal runaway temp.: 800°C
- Thermal runaway low temperature rise, no spark

**Long life**

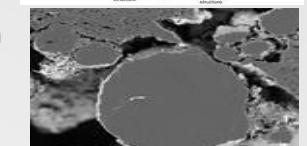


- CATL LFP battery with the cell life up to 10000 times, leads the battery industry.

Optimizing anode/cathode/electrolyte



Graphite With Self-healing Structure (Volume ED≥350Wh/L)



Martia Coating



## Reliability



**Metal Prismatic**  
Lifespan: 20 years



**Polymer Pouch**  
Lifespan: 5 years



**Cylindrical**  
Lifespan: 5 years

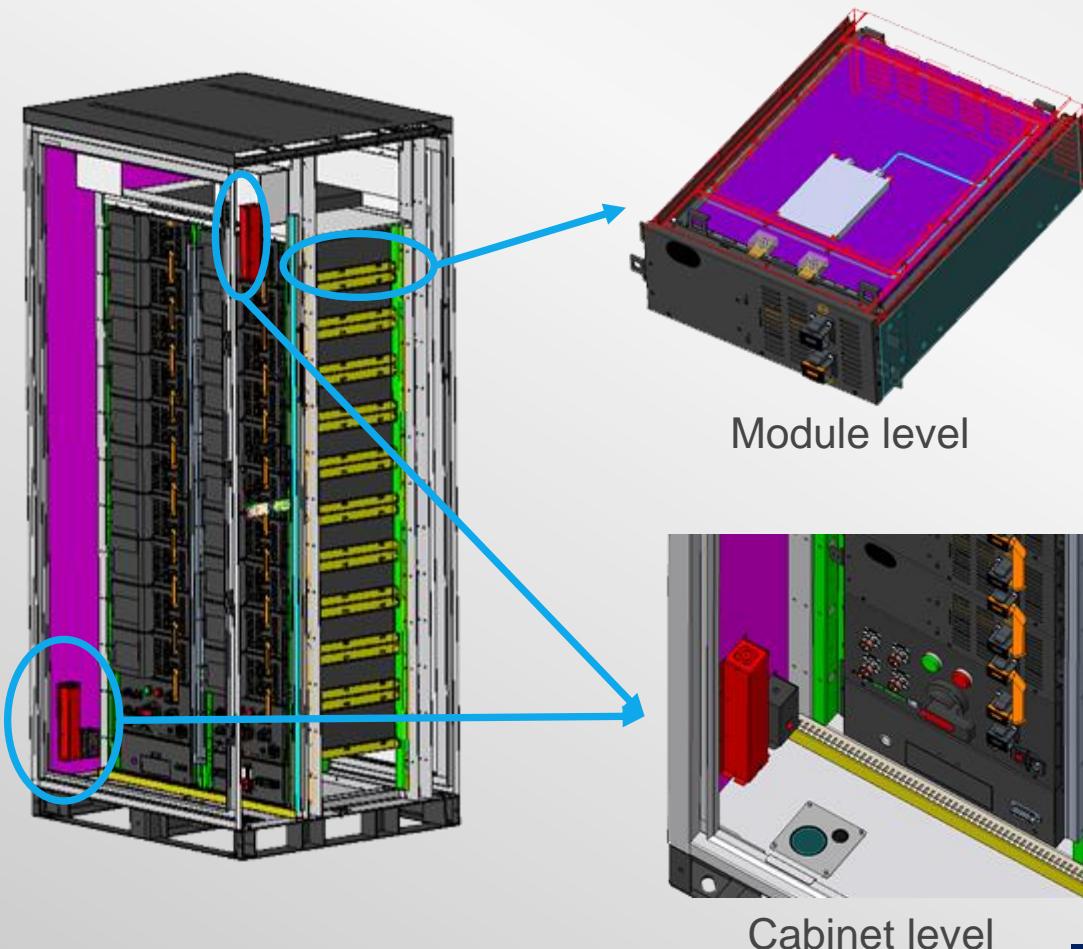


**Plastic Prismatic**  
Lifespan: 5 years

- Prismatic aluminum shell: no deformation, no leakage, directional gas release
- Aluminum-plastic shell: deformation, leakage, poor sealing, Uncontrollable vent hole
- Only the Metal Square cells with aluminum casing in all of its battery packs for long mechanical life-span and safety.

# Double Fire extinguishing system

Automatic and fast response fire extinguishing system on both module and cabinet level



## Module level

- ◆ Each module is fitted with efficient, environmentally friendly **aerosol** that is released when sensor detects abnormal temperature to minimize fire effects.

## Cabinet level

- ◆ The two corners of the battery cabinet are also placed in the **aerosol**, this dual fire extinguishing design makes the entire ESS safer.

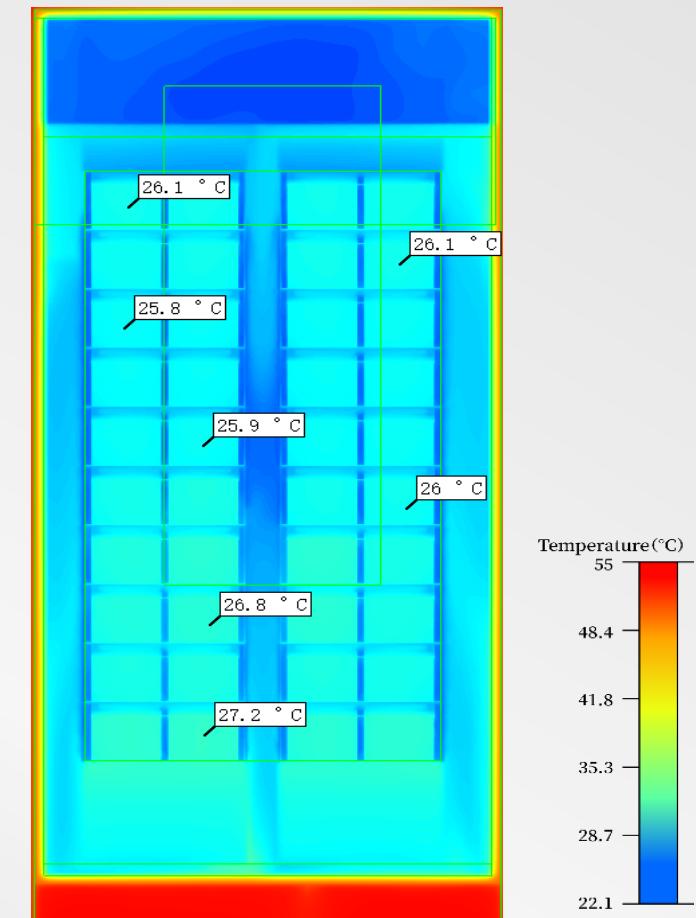
# Built-in HVAC system

High efficiency temperature and humidity management system for batteries' better performance



## Air Condition

- Smart cooling with Tier 1 industrial air conditioning system
- Compact design with wall mounted
- Optimum wind path to ensure high cooling efficiency and low temperature difference(max.  $<5$  °C)
- Enclosed cabinet for better HVAC performance



Ambient Temp: 55 degree Celsius

# Easy installation

*Factory*



- Pre-assembled in the factory

*Transportation*



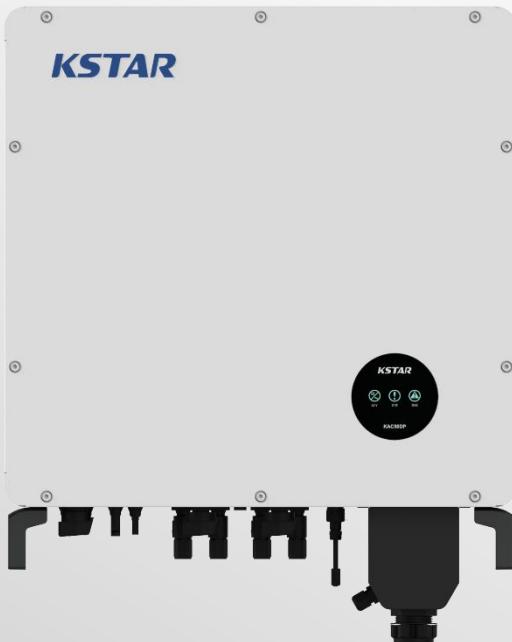
- Container transportation

*Installation*



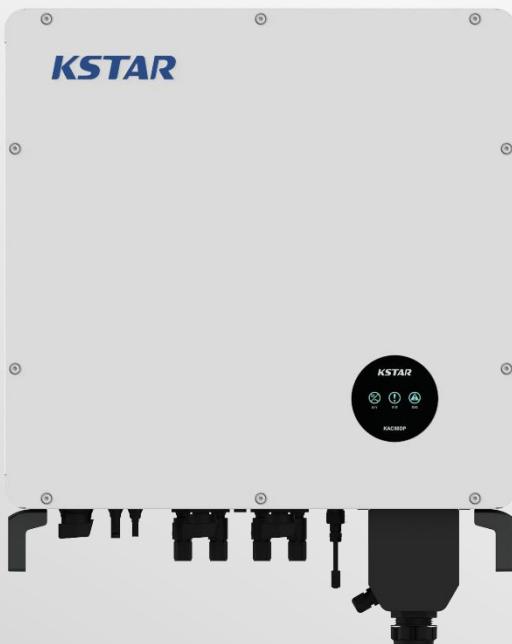
- Forklift transportation

# KSTAR 50kW modular hybrid power converter



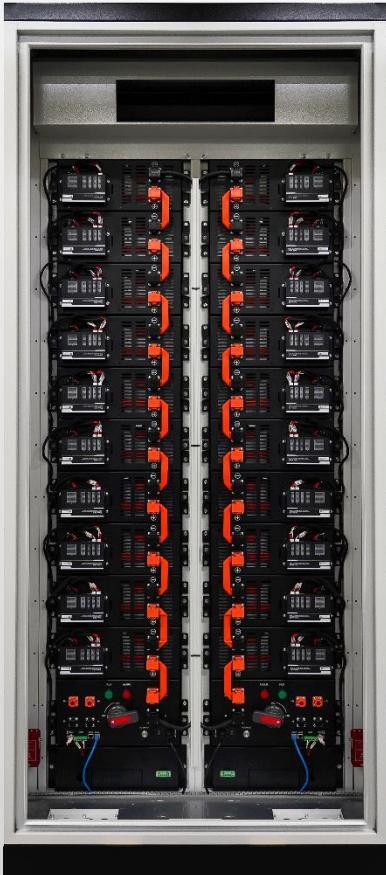
KAC50DP	
PV Side	
Max. Input Voltage	1000V
MPPT Voltage Range	350V~800V
Max. Current per MPPT	36A
Number of MPPT	3
Number of Inputs Per MPPT	2
Battery Side	
Max. Input Voltage	750V
Min. Input Voltage	350V
DC Voltage at Nominal Operation	500V~750V
Max. DC Current	55A*2
Max. DC Input Power	55kW
Number of DC Inputs	2
AC Side(On Grid)	
Nominal AC Output Power	50kW
Max. AC Output Power	55kVA
Max. AC Current	80A
Nominal AC Voltage	400V
AC Voltage Range	50/60Hz±5Hz
Nominal Grid Frequency/Frequency Range	<3%(100% load)
THDv	-1(Lagging)~1(Leading)
Adjustable PF Range	340V~440V

# KSTAR 50kW modular hybrid power converter



KAC50DP	
<b>Efficiency</b>	
Max. Efficiency	97.5%
<b>Protection</b>	
Reverse Connection Protection	Yes
DC Switch	Yes
Over-Temperature Protection	Yes
Grid Monitoring/ Earthing Fault Detection	Yes
Insulation Monitoring	Yes
DC/AC Surge Protection	Yes
Reverse Connection Protection	DC Type II;AC Type III
<b>General Parameters</b>	
Dimensions(WxHxD)	650*715*325mm
Weight	75KG
Topology	Transformerless
IP Protection	IP65
Operation Temperature Range	-25~60°C (>45°C Derating)
Operation Humidity Range	0~100% (No Condensing)
Cooling Method	Intelligent Air Cooling
Max. Operation Altitude	3000m
Communication Port	RS485/CAN
Standards	IEC62477;IEC61000;CE;GB/T;IEC62109;IEC61683;IEC60068;IEC61727;IEC62116;EN50549;VDE4105;G99

# KSTAR 100kWh outdoor battery cabinet



Technical Parameters	BC100DE
Battery type	LFP
Battery module capacity	5.12kWh
Number of modules	10*2
Total battery capacity	102.4kWh
Nominal voltage	512V
Operating voltage range	448V~565V
Charge/Discharge rate	Max. 0.5C
DoD	90%
General Parameter	BC100DE
Dimensions(WxDxH)	1100 x 1100 x2380 mm
Weight	<1.5T
Installation site	Outdoor
IP protection	IP54
Anti corrosion level	C4
Operation humidity	5%~95% (No condensing)
Operation temperature	-30° C~+50° C
Max. operation altitude	4000m (>3000m derating)
Communication port	Ethernet;CAN
Communication protocol	CAN;MODBUS TCP/IP
Cooling method	Air conditioner
Standards	IEC62619-2017;UN38.3;IEC61000-6-2/4



## **PART 04**

# **C&I ESS References**

Powering Green Future

# Ireland 100KW-200KWH Project

## Location:

22 South Village, Dublin, Ireland

## Project overview:

This project is located in the south country of Dublin, Northern Ireland, and the user will place the commercial storage machine in the factory. The project scale is two KAC50DP-BC100DE parallel operation, both using Kstar products.

## Highlight:

- 1、Two System, On grid, Parallel operation.
- 2、Under self Consumption working mode, customers began to make profits in about 4 years.



# England 50KW-100KWH Project

## Location:

West Meadow Lane, Farwellshire, Cornwall, England

## Project overview:

This project is located in the West county of England, placed in a semi-outdoor space, the project is a KAC50DP-BC100DE stand-alone operation.

## Highlight:

- 1、Based on the customer's existing grid-connected photovoltaic inverters, we provide customers with AC-coupled, Self Consumption working mode systems.
- 2、Under self Consumption mode, customers begin to make profits in about 6 years.

