

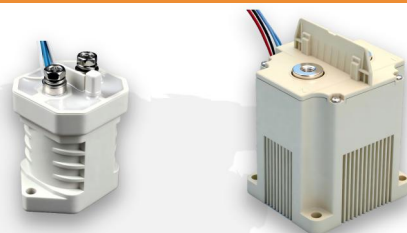


行业解决方案

Industry Solution

储能系统 (ESS) Energy Storage Systems

直流接触器 DC Contactor



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For more product and industry information, please visit our company website.

Google www.alq-dccontactor.com

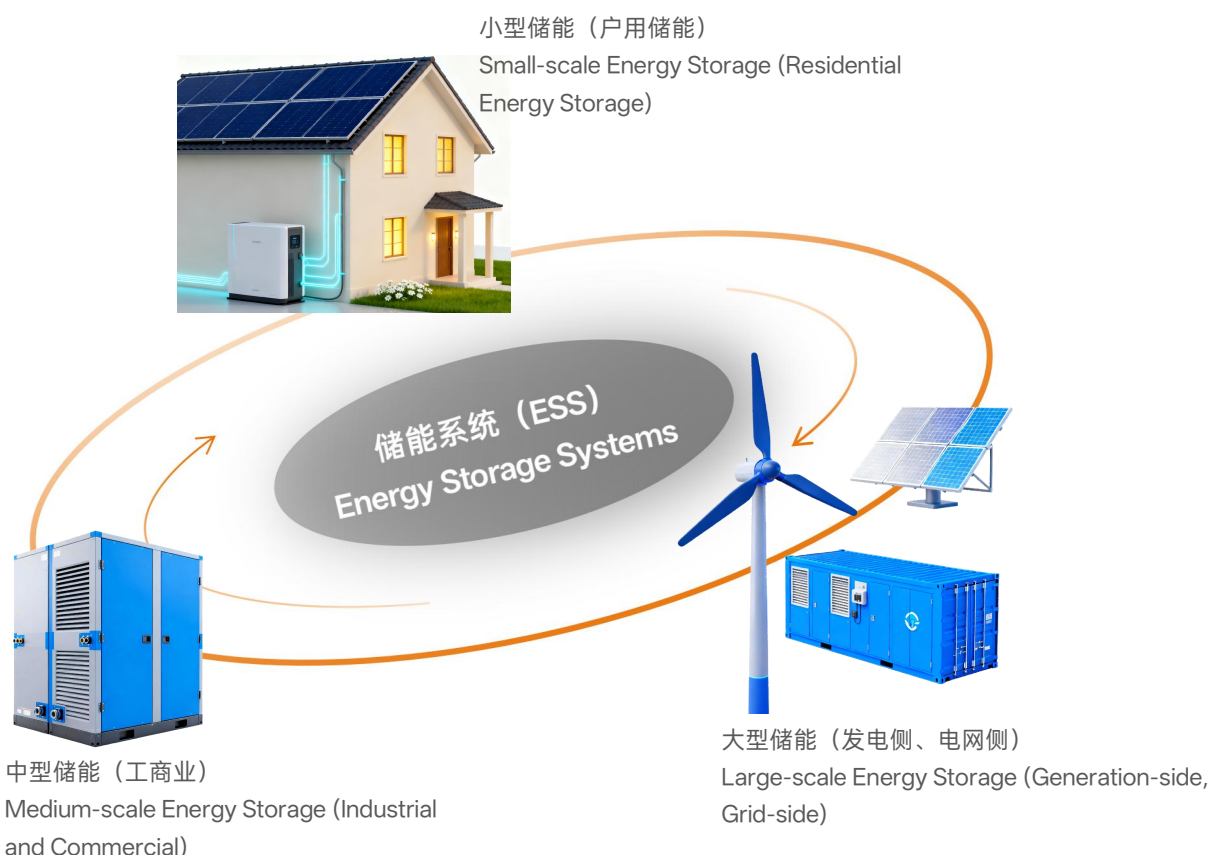


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SuZhou ALQ Electronic Technology CO.,LTD.

储能系统描述 Description of Energy Storage System

■ 储能系统类别 Types of Energy Storage Systems



■ 储能系统的核心特点 Core Features of Energy Storage Systems

储能系统主要用于电能的存储与释放，其运行环境和工况有明确特征：

- 1、**高电压大电流**：系统电压覆盖几百到上千伏，充放电电流可达数百安培，瞬时冲击电流更大。
- 2、**频繁切换**：需频繁在充电、放电、待机模式间切换，对元件的通断次数要求高。
- 3、**安全性要求高**：涉及高能量存储，一旦发生短路或故障，需快速可靠切断电路，避免火灾等风险。

Energy storage systems are mainly used for storing and releasing electrical energy, with distinct characteristics in their operating environment and working conditions:

1. **High voltage and large current**: The system voltage ranges from several hundred to thousands of volts, with charging and discharging currents reaching hundreds of amperes, and instantaneous inrush currents being even larger.
2. **Frequent switching**: They need to switch frequently between charging, discharging, and standby modes, requiring components to have a high number of on-off cycles.
3. **High safety requirements**: Involving high-energy storage, in case of short circuits or faults, the circuit must be cut off quickly and reliably to avoid risks such as fires.

■ 储能系统对直流接触器的关键要求 Key Requirements of Energy Storage Systems for DC Contactors

基于上述特点，直流接触器需满足以下核心指标：

- 1、高电压大电流耐受能力。
- 2、长电寿命与机械寿命。
- 3、优异的灭弧性能。

Based on the above features, DC contactors must meet the following core indicators:

1. Capability to withstand high voltage and large current.
2. Long electrical and mechanical lifespan.
3. Excellent arc-extinguishing performance.

直流接触器选型指南 DC Contactor Selection Guide



EVQ1D

直流接触器 DC Contactor

- 尺寸（长×宽×高）：
Dimensions(L×W×H):
51.5×36×48.9 mm
- 额定电流(可选):
Rated Current (Optional):
10/30/50 A
- 最大切换电压:
Max. Switching Voltage:
1000 Vdc

■ 应用场景

- ✓ 预充电电路
- ✓ 加热电路

■ 产品特点

- ✓ 小体积，长寿命
- ✓ 适用于低温、高湿、多尘、高海拔等恶劣环境下运行

■ Application Scenarios

- ✓ Pre-charging circuit.
- ✓ Heating circuit.

■ Product Features

- ✓ Compact size, long service life.
- ✓ Suitable for operation in harsh environments such as low temperature, high humidity, dusty and high altitude conditions.



EVQ2H

直流接触器 DC Contactor

- 尺寸（长×宽×高）：
Dimensions(L×W×H):
53.8×40.2×59.4 mm
- 额定电流(可选):
Rated Current (Optional):
100/135 A
- 最大切换电压:
Max. Switching Voltage:
1500 Vdc

■ 应用场景

- ✓ 户用储能控制系统

■ 产品特点

- ✓ 小体积，长寿命，低温升，高电压
- ✓ 运行可靠

■ Application Scenarios

- ✓ Residential energy storage control system.

■ Product Features

- ✓ Compact size, long service life, low temperature rise, and high voltage.
- ✓ Reliable operation.



EVQ15

直流接触器 DC Contactor

- 尺寸（长×宽×高）：
Dimensions(L×W×H):
82.0×76.4×114.9 mm
- 额定电流(可选):
Rated Current (Optional):
400/500/600 A
- 最大切换电压:
Max. Switching Voltage:
1500 Vdc

■ 应用场景

- ✓ 大型储能控制系统
- ✓ 中型储能控制系统

■ 产品特点

- ✓ 具有高电压、大电流的控制能力。
- ✓ 长寿命，低温升，运行可靠

■ Application Scenarios

- ✓ Large-scale energy storage control system
- ✓ Medium-sized energy storage control system

■ Product Features

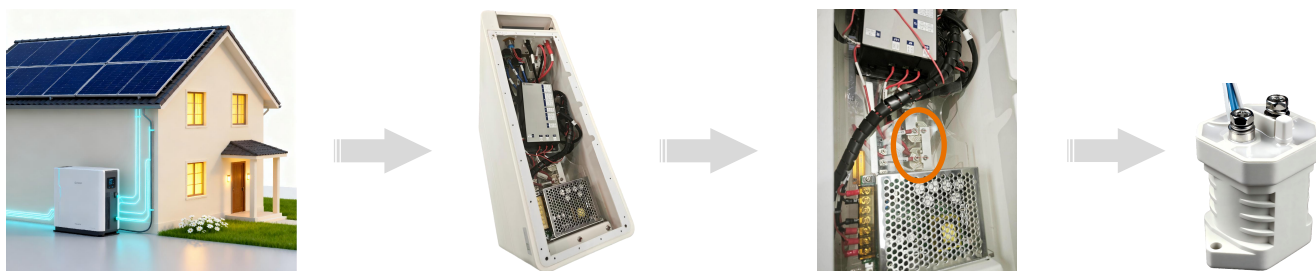
- ✓ Possesses control capability for high voltage and large current.
- ✓ Long service life, low temperature rise, and reliable operation.

本文列出了适用于储能系统（ESS）的直流接触器，用户可根据需要自行选择。如果本文中找不到合适的产品，请及时联系安来强以获取更多技术支持。安来强可以根据用户需求定制产品。

This article lists DC contactors suitable for energy storage systems (ESS), from which users can choose according to their needs. If no suitable product is found in this article, please contact ALQ in a timely manner for further technical support. ALQ can customize products according to user requirements.

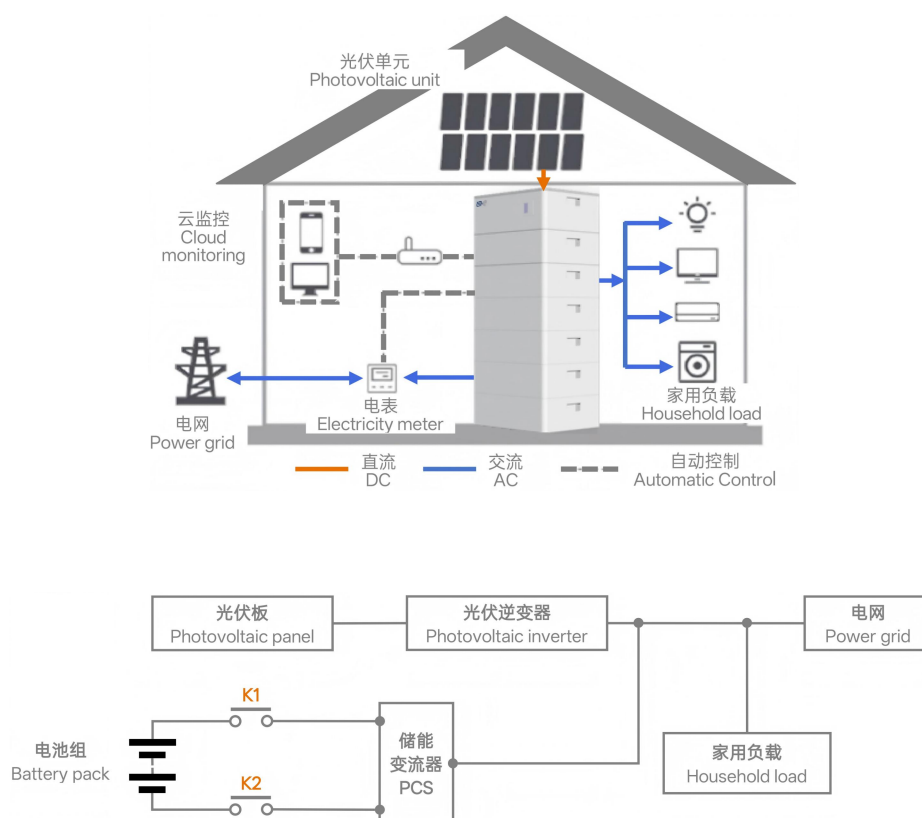
户用储能 Residential Energy Storage

■ 应用案例 Application Cases



■ 户用储能系统典型控制电路示意图

Typical Control Circuit Schematic Diagram of Residential Energy Storage System



■ 户用储能系统介绍

Introduction to Residential Energy Storage Systems

户用储能是安装在家庭场景、用于储存电能并按需使用的设备系统，核心是“存电”和“自用”。户用储能系统本质是家庭的“私人充电宝”，主要解决家庭用电的灵活性和经济性问题。

Household energy storage systems are installed in residential settings to store electrical energy for on-demand use, with the core functions of "energy storage" and "self-consumption". Essentially, a household energy storage system is a "private power bank" for homes, primarily addressing issues related to flexibility and cost-effectiveness in household electricity usage.

一、户用储能核心构成 Core Components of Household Energy Storage

户用储能系统并非单一设备，而是由多个关键部件协同工作的整体，主要包括三部分：

1. **储能电池**：核心储电部件，相当于“电池本体”，目前主流是安全性更高的磷酸铁锂电池。
2. **逆变器**：负责电能转换，可将太阳能板产生的直流电、电池储存的直流电，转换为家庭可用的交流电。
3. **控制与保护系统**：智能管理核心，能监测用电状态、控制充放电时机，并具备过充、过放、短路等保护功能。

A household energy storage system is not a single device but an integrated unit where multiple key components work together. It mainly consists of three parts:

1. **Energy Storage Battery**: The core component for energy storage, equivalent to the "battery itself". Currently, lithium iron phosphate batteries, which offer higher safety, are the mainstream choice.
2. **Inverter**: Responsible for energy conversion. It can convert direct current (DC) generated by solar panels and stored in batteries into alternating current (AC) usable by household appliances.
3. **Control and Protection System**: The intelligent management core. It monitors electricity usage status, controls charging and discharging timings, and provides protection against overcharging, over-discharging, short circuits, and other hazards.

二、户用储能主要功能与作用 Main Functions and Roles of Household Energy Storage

户用储能的价值主要体现在三个方面，满足不同家庭的需求：

1. **配合光伏自用**：若家庭安装了太阳能板，白天发的电可优先储存起来，避免多余电量浪费，晚上再用储存的电能，最大化利用清洁能源。
2. **应对停电备用**：作为应急电源，在电网停电时自动切换供电，保障冰箱、照明、路由器等关键设备的基本用电。
3. **节省电费开支**：在部分实行峰谷电价的地区，可在电价低的“谷段”充电，在电价高的“峰段”放电使用，通过价差降低用电成本。

The value of household energy storage is reflected in three aspects, meeting the needs of different households:

1. **Synergy with PV for Self-Consumption**: If a home has solar panels installed, the electricity generated during the day can be prioritized for storage to avoid wasting excess energy. The stored energy is then used at night, maximizing the utilization of clean energy.
2. **Backup Power for Power Outages**: Acting as an emergency power source, it automatically switches to supply electricity when the grid fails, ensuring basic power for critical devices such as refrigerators, lighting, and routers.
3. **Reduction of Electricity Bills**: In regions with time-of-use electricity pricing, the system can charge during "off-peak" hours when electricity prices are low and discharge for use during "peak" hours when prices are high, lowering electricity costs through price differences.

三、直流接触器在户用储能的核心功能 Core Functions of DC Contactors in Residential Energy Storage Systems

直流接触器的功能围绕“控制”和“保护”展开，主要体现在三个方面：

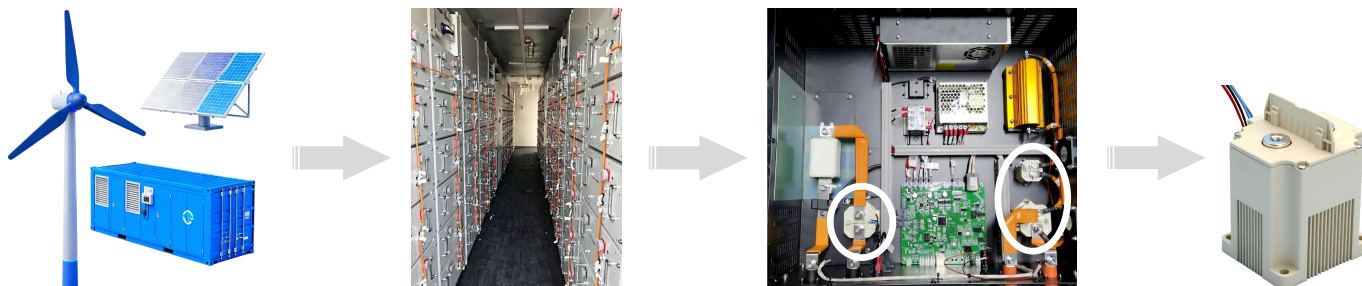
1. **电路通断控制**：作为核心开关，负责连接或切断电池与逆变器之间的直流回路。系统需要充电、放电时，它就闭合接通电路；系统停机或故障时，它就断开切断电路。
2. **过载与短路保护**：当电路中出现电流过大（如过载）或短路故障时，直流接触器能快速断开，避免过大电流损坏电池、逆变器等昂贵核心部件，起到“保险丝”之外的双重保护作用。
3. **安全隔离**：在系统维护、检修，或长期停机时，直流接触器断开后可实现电路的物理隔离，防止人员在操作时接触到高压直流电，保障人身安全。

The functions of DC contactors revolve around "control" and "protection", mainly reflected in three aspects:

1. **Circuit On-off Control**: Acting as the core switch, it is responsible for connecting or disconnecting the DC circuit between the battery and the inverter. When the system needs to charge or discharge, the contactor closes to conduct the circuit; when the system shuts down or malfunctions, it opens to cut off the circuit.
2. **Overload and Short-Circuit Protection**: When an overcurrent (such as overload) or short-circuit fault occurs in the circuit, the DC contactor can disconnect quickly. This prevents expensive core components like batteries and inverters from being damaged by excessive current, serving as a dual protection beyond the "fuse".
3. **Safety Isolation**: During system maintenance, overhaul, or long-term shutdown, the DC contactor can achieve physical isolation of the circuit after disconnection. This prevents personnel from contacting high-voltage DC electricity during operation, ensuring personal safety.

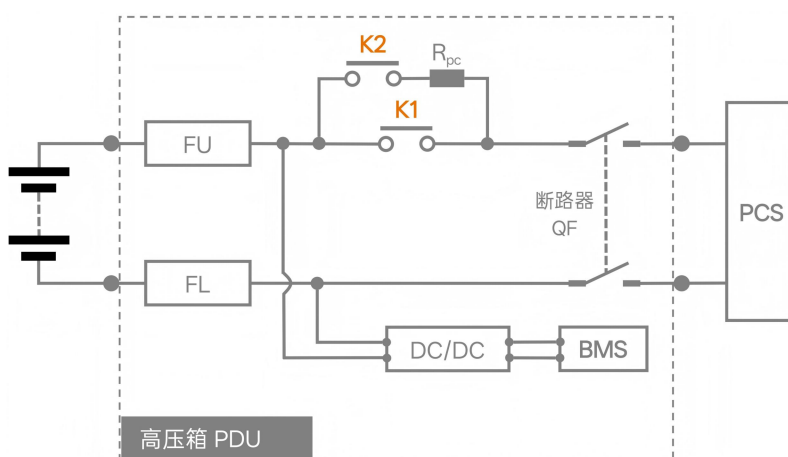
大型储能（发电侧、电网侧） Large-scale Energy Storage (Generation-side, Grid-side)

■ 应用案例 Application Cases



■ 大型储能系统典型控制电路示意图

Schematic Diagram of a Typical Control Circuit for a Large-Scale Energy Storage System



说明：

- ✓ K1 为主回路直流接触器。
- ✓ K2 为预充直流接触器。

Note:

- ✓ K1 is the main circuit DC contactor.
- ✓ K2 is the pre-charging DC contactor.

■ 说明：

- ✓ 需了解产品详情，请联系安来强或浏览安来强官网以获取相应的产品说明书。
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■ Explanation

- ✓ For product details, please contact ALQ or visit its official website to obtain the corresponding product specifications.
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