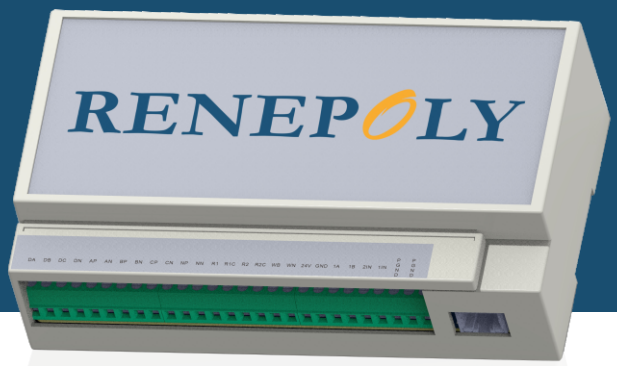
Renepoly Power Failure Detection Device



Product Introduction

Renepoly Power Failure Detection Device developed by Guangzhou Renepoly Energy Technology Co., Ltd. , is designed to ensure seamless switching in energy storage systems during instantaneous grid outages, preventing critical equipment from restarting due to voltage dips. Suitable for core devices in PV, energy storage, or hybrid energy systems, it enables intelligent switching between grid-connected and off-grid modes.

Current PCS units support VSG (Virtual Synchronous Generator) functionality, which emulates synchronous generator characteristics to independently maintain voltage and frequency during microgrid or off-grid operation, ensuring stable power supply. VSG features include: grid-connected grid-forming support (power support, inertia, damping, and harmonic optimization), grid-forming seamless switching (fault isolation and non-stop switching via Power Failure Detection Device), diesel-storage hybrid coordination (capacity expansion, hybrid output, and reduced hardware costs), and off-grid grid-forming capability (supporting weak-communication or communication-less off-grid systems).

During grid anomalies, the Power Failure Detection Device connects the energy storage power to the load and disconnects the load from the direct grid connection, preventing energy storage from feeding back into the grid and overloading it, thereby ensuring safe PCS operation.

Product Applications:

- Seamless switching for grid-forming energy storage: Suitable for industrial and commercial storage, hospitals, data centers, or other scenarios requiring uninterrupted power supply.
- Safe interconnection of distributed microgrids: Ideal for integrated solar-storage stations or off-grid microgrids reconnecting to the public grid.
- Multi-energy complementary coordination: Applicable to hybrid multi-energy microgrids in remote areas, mines, islands, and other complex energy scenarios.

Main Functions

- Continuous monitoring of key grid parameters including voltage, frequency, and phase, providing real-time data for interconnection and disconnection control.
- Output “close permission” signals when synchronization conditions are met, supporting safe connection of energy storage systems.
- Rapid detection and determination logic to output disconnection signals in milliseconds or sub-milliseconds during grid outages or abnormal conditions.
- Fast disconnection control to prevent the energy storage system from feeding the public grid after an outage, avoiding islanding risks.
- Provision of operational status, grid connection status, and alarm information through indicator lights or communication interfaces.

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Product Features

- Sub-millisecond rapid recognition technology: Power Failure Detection Device responds at sub-millisecond speed.
- Intelligent closing logic: Fully automated time-slot control ensures grid connection without oscillation or impact.
- Highly integrated modular design: Isolation and interconnection functions operate independently yet in close coordination.
- Wide-voltage power supply support.
- Digital monitoring and multi-mode interaction: Integrates with on-site controllers via Modbus protocol.

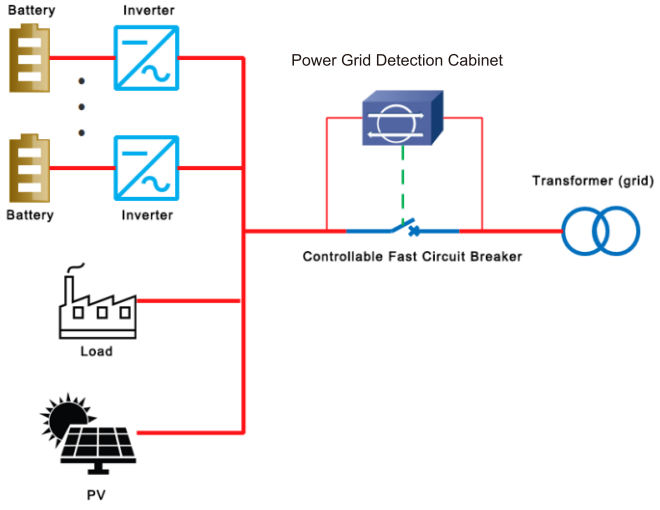

Fig. 1 - Functional Diagram

Technical Parameters

Power Supply	12-24VDC, Power < 3 W
Main Chip	Dual-core microcontroller, 240 MHz, 8 MB PSRAM, 8 MB storage
Communication Protocol	Custom, Modbus RTU, Modbus TCP
RS485	1
Ethernet	1
Digital Input Interfaces	2
Mechanical Relay Outputs	2
Three-Phase AC Interface	A, B, C, N
Single-Phase AC Interface	A, N
Three-Phase Current Acquisition Interface	Supports various CT ratios
Dimensions	179*100*52.5mm
Weight	~200g
Operating Temperature	−40℃-80℃
Operating Humidity	5-95%
Mounting Method	DIN 35 mm rail

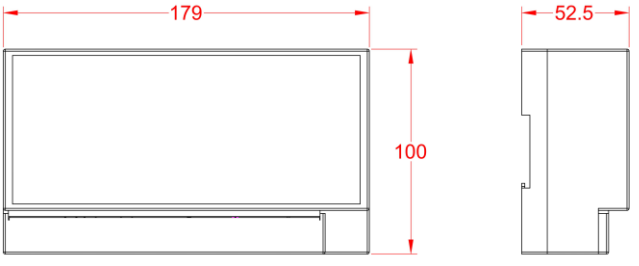

Fig. 2 – Product dimensions