EGbatt-125kW Power Conversion System

Technical Specification Document

Version: V2025.1 | Release Date: November 18, 2025

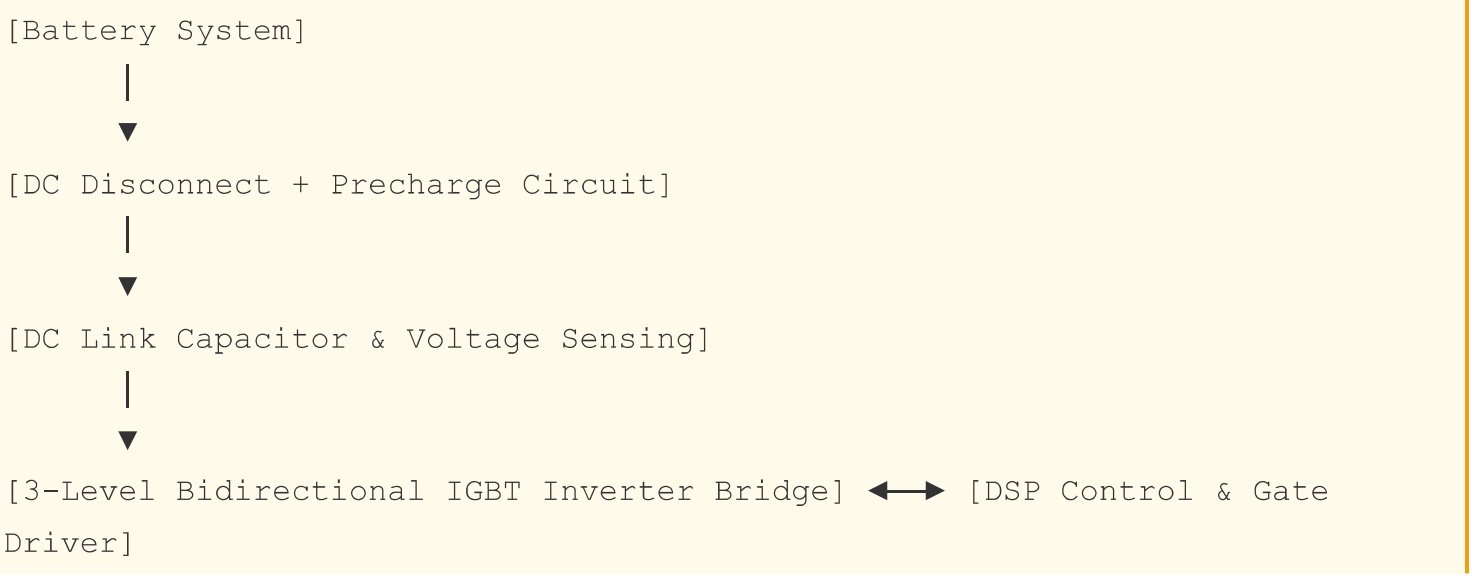
1. Product Overview

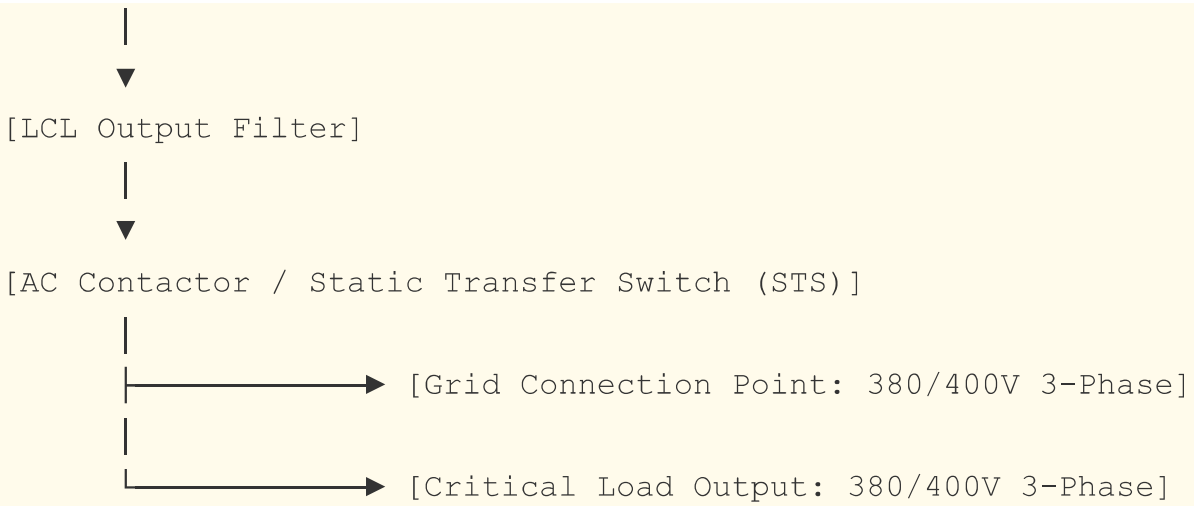
The **EGbatt Series Power Conversion System (PCS)** is an advanced power electronic device specifically designed for energy storage systems. It serves as a bidirectional energy conversion bridge, enabling high-efficiency conversion between direct current (DC) and alternating current (AC) during energy storage and discharge cycles, while providing comprehensive charge/discharge management and control for energy systems.

The system is adaptable to multiple operational scenarios including: **grid-tied operation**, **off-grid mode**, **weak grid conditions**, **diesel generator hybrid systems**, **solar-plus-storage integration**, and **specialized industrial applications**. With comprehensive functionality, it provides a one-stop solution for on-site power quality challenges including active/reactive power imbalance, harmonic current distortion, and distribution transformer power quality issues.

1.1 Electrical Schematic

Figure 1: Single-Line Electrical Schematic





1.2 Model Number Designation

Front-Wiring Model: EGB-PCS125-L2M-3

Numbering Explanation:

1 - **EGB**: EGbatt Product Series
2 - **PCS**: Power Conversion System
3 - **125**: Power Rating: 125kW
4 - **L**: Voltage Class: 400V
5 - **2**: Protection Rating: IP20
6 - **M**: Modular Equipment
7 - **3**: 3rd Generation Product

Rear-Wiring Model: EGB-PCS125-L2M-B3

Numbering Explanation:

1 - **EGB**: EGbatt Product Series
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5 - **2**: Protection Rating: IP20
6 - **M**: Modular Equipment
7 - **B**: Rear-Wiring Configuration
8 - **3**: 3rd Generation Product

2. Product Features

Flexible Application

- ✓ Wide DC voltage range: 580-950V (3-phase 3-wire), 630-950V (3-phase 4-wire)
- ✓ Same model compatible with both 3-phase 3-wire and 3-phase 4-wire connections
- ✓ Supports various installation orientations: vertical, horizontal, side-mounted
- ✓ 125kW power rating, compatible with 600+Ah large-format battery cells
- ✓ Multi-module parallel operation for capacity expansion
- ✓ Supports 20+ mainstream BMS protocols

High-Efficiency Conversion

- ✓ High-efficiency IGBT with 3-level topology achieves up to 98.5% conversion efficiency
- ✓ Modular design for easy installation, maintenance, and upgrades
- ✓ Charge/discharge transition time < 20ms
- ✓ Fast response with power response time < 10ms

Comprehensive Applications

- ✓ 4-quadrant active/reactive power regulation
- ✓ Supports constant power, DC constant current, AC constant current, and AC constant voltage control
- ✓ Resolves three-phase power imbalance issues
- ✓ Low-order harmonic mitigation capability
- ✓ 3-phase 4-wire configuration for stable off-grid operation
- ✓ Optional STS for seamless grid/off-grid transition

Stable Operation

- ✓ Comprehensive fault protection
- ✓ High power factor in grid-tied mode
- ✓ Voltage distortion rate < 3% with nonlinear loads in off-grid mode

- ✓ Low/High Voltage Ride-Through (LVRT/HVRT) support
- ✓ Anti-islanding protection

3. Technical Specifications

Parameter	Specification
Model Number	EGB-PCS125-L2M-3 / EGB-PCS125-L2M-B3
DC Parameters	
DC Voltage Range	580～950V (3P3), 630～950V (3P4W)
Maximum DC Current	210A
Voltage Regulation Accuracy	≤ ±1%
Current Regulation Accuracy	≤ ±1%
AC Parameters (Grid-Tied)	
Rated Power	125kW
Allowable Grid Voltage	380V/400V (-15% ～ +15%)
Maximum Current	190A
Allowable Grid Frequency	45～55Hz / 55～65Hz
Power Factor	> 0.99 (at rated power)
Power Factor Adjustment Range	-1 (leading) ～ +1 (lagging)
DC Component	< 0.5% (of rated AC current)
Total Current Harmonic Distortion	< 3% (at rated power)

Parameter	Specification
Full-Power Charge/Discharge Transition Time	< 20ms
110% Overload Maximum Operating Time	10 min
120% Overload Maximum Operating Time	1 min
AC Parameters (Off-Grid)	
Off-Grid AC Voltage	380/400V ±15%
Off-Grid AC Frequency	50Hz / 60Hz
AC Voltage Control Accuracy	< 1%
AC Voltage Unbalance Ratio	< 2%
Off-Grid Output Voltage Distortion	< 3% (with nonlinear loads)
General Parameters	
Wiring Configuration	Front/Rear wiring optional (two different models)
Dimensions (W×D×H, mm)	Front-wiring: 500×650×200 Rear-wiring: 500×680×200
Weight	Front-wiring: 50kg Rear-wiring: 53kg
Isolation Method	Transformerless
Grid Support	L/HVRT Active/Reactive Power Control
Protection Rating	IP20
Maximum Conversion Efficiency	98.5%

Parameter	Specification
Airflow Rate	Front-wiring: 720 CFM Rear-wiring: 769 CFM
Noise Level	≤ 65dB
Cooling Method	Intelligent Air Cooling
MTBF (Mean Time Between Failures)	≥ 100,000 hours
Operating Temperature Range	-25°C ～ 60°C (derating above 45°C)
Humidity	0 ～ 95% RH
Maximum Operating Altitude	3000m (derating required above 3000m)
Communication	
Communication Interface	RS485, CAN
Communication Protocol	Modbus RTU, CAN 2.0
BMS Integration	Supported

4. Power Curves

4.1 AC Voltage Derating Curve

Figure 4: Output power derating as a function of grid voltage deviation. Full power maintained within ±10% of nominal voltage; linear derating applied beyond this range.

4.2 Battery Voltage Derating Curve

Figure 5: Output power capability vs. DC input voltage. Optimal efficiency window: 700-900V DC; derating applied near voltage range limits.

4.3 Altitude Derating Curve

Figure 6: Maximum continuous power vs. installation altitude. Full rating up to 2000m; linear derating to 80% at 3000m; not recommended above 4000m.

4.4 Ambient Temperature Derating Curve

Figure 7: Output power vs. ambient temperature. Full power from -25°C to +45°C; linear derating from 45°C to 60°C; shutdown above 60°C.

Note: Derating curves are reference guidelines. Actual performance may vary based on installation conditions, ventilation, and load profile. Consult EGbatt engineering for site-specific validation.

EGbatt Power Conversion Systems

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