



# Merus<sup>®</sup> PCS

## Power Conversion System

Merus Power, a Finnish technology leader, delivers innovative turnkey battery energy storage system (BESS) solutions, fully designed, manufactured, and tested in-house. With proprietary technology like the Power Conversion System (PCS) and the Control & Protection System developed internally, we ensure seamless integration with top-tier LFP batteries and maintain the flexibility to adapt swiftly to evolving market demands.



### SCALABLE DESIGN WITH EXPERTISE

Redundant and independent units in offering the flexibility to design tailored solutions that maximize profitability for each customer, supported by our expert engineers who are always available to assist.



### GRID FORMING CAPABILITIES

With decades of power electronics expertise, Merus Power originated as a grid support company and is now pioneering advancements like grid-forming capabilities. As Finland leads in adopting these requirements, we help clients stay competitive as similar standards emerge across Nordic markets.



### SUPERIOR WEATHER RESISTANCE

Engineered for arctic conditions down to -40°C, snow, and ice, our system ensures safe, reliable operations and high availability in any weather.



### SAFETY PRIORITIZED

As a European manufacturer, we prioritize safety, durability, and cybersecurity in every design. We ensure long-lasting performance and incorporate advanced protective measures to keep our solutions secure and resilient in an increasingly digitalized energy landscape.

GENERAL INFORMATION	
Origin of goods	Finland
Standard compliance	IEC 62933, Electrical energy storage (EES) systems
ENVIRONMENTAL CONDITIONS	
Ambient temperature	-40°C to 40°C without derating. Up to 60°C with derating
Type of installation	Outdoor
UNIT RATINGS AT PCC	
Active Power (800V Un)	1000–5000 kW
Apparent Power (800V Un)	1053–5265 kVA
Power factor range	+/- 0,95 at rated active power
AC CONNECTION	
AC system type	690–800 V +/- 10 IT system, 3-wire
Available voltage levels	Any voltage above 800 V with a step-up transformer(s)
Frequency	50/60 Hz (47.5–51.5 Hz / 57.5–61.5. Hz)
Specified power quality	IEEE-519-2014, EN 50160 (requirement in PQ control, specification in Voltage control)
PCM inverters	3-level aNPC inverters with inverter level protection
BATTERIES	
Battery type	LFP
Battery voltage range	Up to 1500VDC
OPERATION & PERFORMANCE	
Control system type	Merus Control Platform: High-performance DSP+MCU+FPGA with peripheral cards for communication with subsystems
Control system response time	<1 ms
Maximum power ramp rate	0 ... nominal power in a network cycle (16.67 ms / 20 ms) [1]
Output current quality	< 3 % THD(i)
Control modes	Grid-connected (PQ control), Islanded operation (voltage control), Grid Forming (GFM)
Operation algorithms	Dispatch (active and reactive power setpoint), Frequency regulation, Voltage regulation Reserve markets, Power limiting, State of charge (SoC) control, Black start (optional)
Maximum charge / discharge efficiency	>98% typical 98,8 peak % [2]
HOUSING	
Ingress protection	IP55 and IP3X
Ventilation	Forced air cooling
1–5 MW PCS dimensions	4712–10901mm x 1200mm x 2400mm (W x D x H) [3]
1–5 MW PCS weight	2800–7400 kg
MONITORING AND CONNECTIVITY	
HMI	Local touchscreen at system level (optional)
Remote operations and digital services	MERUSCOPE™ platform
Available interfaces for external systems	IEC-104

[1] Subject to network fault level. The ramp rate is usually intentionally slowed down to avoid rapid transients in the network.

[2] Efficiency for PCS only. System efficiency is configuration- and operation point dependent. For details, please contact Merus Sales.

[3] For detailed dimensions refer to Merus PCS site planning data document.

