

BALANCELL®

INTELLIGENT ENERGY STORAGE



MODEL P00033

Voltage: 104V
Energy: 21.4kW
Capacity: 206Ah

The Balancell P33 battery module is designed for use as a stand-alone battery or in strings of up to 8 units or 820 V DC. It has an integrated battery management system and fuse and provides a digital (0 – 10V) battery OK signal and CAN interface for pack level integration.

Battery Specifications and Accountability

Nominal Energy: 21.4kWh | Nominal Voltage: 104V | Nominal Amp Hours: 206Ah | Model Number: P33

Real Amp Hour Capacity	This is viewable and measurable in the battery history for every discharge throughout lifetime
History and Data Logging	All data is recorded for every minute up to 30 years internally (and sent to gateway if online)
Energy Output Logging	The Total Energy Output in kWh, or total lifetime operating hours are all recorded, and visible online
Series String	Up to 8 modules in series, 832 VDC nominal, 920 VDC peak
Parallel Batteries	No practical limit within battery but conductors to each battery should be similar lengths
Warranty	Energy output: 42 000 kWh Calendar time - 5 yrs Operating Hours - 20 000 hrs - If matched to machine
End of Warranty	Battery capacity at 80% or more of full nominal capacity
Battery Cycle Life	Unlimited cycles up until the total energy output or Calendar time, whichever comes first (100% Depth of Discharge allowed)
Recycling - End of life	EnviroServe - Our partner recycling company

Discharge Limits

Continuous Discharge Current	200A	1C continuous
Surge Discharge Current - 30 Seconds	600A	3C transient. Typically repeated for every lift or peak load
Internal Battery Fuse	300A	$I^2t = 610\ 000\ As$
Minimum Battery Voltage	94.4V	Battery will cutout here, regardless of indicated SOC
ABSOLUTE Minimum Battery Voltage	86.8V	Below this, pack needs to be inspected before further use

Charge Limits

Maximum Continuous Charging Current	150A	Preferred range is 100A to 150A, set for constant current CC
End of Charge Voltage	112V	86.8V to 87.5V max set as endpoint CV voltage
Balancing Charge Voltage or Current	112.3V	87.5V-88.0V OR charge at constant current (CC) of 400mA
Charger Voltage Range	96V	Charger voltage must be within normal 24V limits.
Battery Maximum Voltage Self Cut Out	112.8V	Battery will cutout, preventing further charging

Mechanical Design

Length: 714 mm | Width: 516 mm | Height: 302 mm | Mass: 148 kg

Specific (Gravimetric) Energy Density: 145 Wh/kg | Volumetric Energy Density: 208 Wh/l

Cell Insulation: Standard with Additional PET 300-micron cover added to all cells for safety and vibration tolerance

Cell Compression: ~ 3000N | G-shock tolerance - > 5 times IEC 61485 | Environmental - IP61

Interlinks, Cell to Cell, Cell to Terminal: Flexible laminated tin-plated copper

Operating Range

Minimum

Maximum

Notes

Operating Range	Minimum	Maximum	Notes
Usable SOC Range	0%	100%	Battery cut-out can be configured from 0 - 25%
Storage SOC	20%	100%	Battery should be fully charged before storage
SOC Accuracy	-0.1%	+0.1%	Typical accuracy in normal daily use
SOC Daily Drift	-0.1%	+0.1%	Drift while not in use. Will reset at top or bottom of charge
Charging Temperature	5°C	55°C	Battery cuts out at beyond these. Preferred range 10°C - 45°C
Discharging Temperature	-15°C	55°C	Battery cuts out at beyond these. Preferred range 10°C - 45°C
Storage Temperature	0°C	25°C	Preferred for optimum lifetime is 5-10°C

Protection

Individual Cell

Battery Level

Protection	Individual Cell	Battery Level
Over Voltage	Yes	Yes, tapers reported current allowed
Over Discharge	Yes	Yes, based on voltage and on SoC
Over Temperature	Yes	Yes
Under Temperature	Yes	Yes
Charge Rate	Yes	Yes
Short Circuit	Fuse is present on each battery module	

Communication Options

Cellular	Global sim with lifetime connectivity (15yrs), Standard on Industrial Motive Batteries	2G, 3G or NB-IoT
Serial	RS232 standard, RS485 converter (MODBUS) optional	Isolated to 1000V
CANbus	CANopen standard, 5V@200mA available, OEM comms on request	Isolated to 2500V
Wifi	Standard	

Certification and Standards

Cell Certifications	GB	Certified to - GB31484, GB31485, GB31486, UL1973, MSDS UN38.3
Cell Manufacturing	ISO	Certified to - ISO9001, ISO14001, TS16949
Battery Manufacturing	ISO	In process - ISO9001 certification
Electromagnetic Compatibility	CE	Certified to - EN 301 489-1: V2.2.3, EN 301 489-52: V1.1.0, EN / IEC 61326-1
Battery Standards	IEC	Designed to meet - IEC 62485-6, IEC 63056, IEC 61619, IEC 62660-2
Battery Standards	UL	Designed to meet - UL 2580

Accessories

OLED SoC% Display	0-100%, Error messages, Power & Charging LEDs. Configurable Buzzer at low SOC
Hockey PUK Charger	400mA CC, For float charging, balancing, and recovery from a deep discharge dormant state