

# BALANCELL®

INTELLIGENT ENERGY STORAGE



## HV MODEL P33

**Voltage:** 104V

**Energy:** 21.4kWh

**Capacity:** 206Ah

The Balancell P33 High Voltage battery module is designed for use as a stand-alone battery or in strings of up to 10 units or 1040 V DC. It has an integrated battery management system and provides a 24V battery OK signal and RS485 interface for pack level integration.

### Battery Specifications and Accountability

Nominal Energy: 21.4kWh | Nominal Voltage: 104V | Nominal Amp Hours: 206Ah | Model Number: P00033

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 10 modules in series, 1040 VDC nominal, 1130 VDC peak
Parallel Batteries	No practical limit within battery but conductors to each battery should be similar lengths
Warranty	Energy output: 100% DOD - 62,000kWh, <80% DOD - 100,000kWh   Calendar time - 10 years
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
Surge Discharge Current - 3 min	400A	2C Long pulse
Minimum Battery Voltage	94.4V	Battery will cut out 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	111.1V to 112V max set as endpoint constant voltage (CV)
Balancing Charge Voltage or Current	112.3V	112V to 112.3V OR charge at constant current (CC) of 500mA
Charger Voltage Range	104V	Charger voltage must be within 94.4 to 112V range
Battery Maximum Voltage Self Cut Out	112.8V	24V battery OK output signal disabled

## Mechanical Design

Length: 745 mm | Width: 472 mm | Height: 260 mm | Mass: 148 kg

Specific (Gravimetric) Energy Density: 145 Wh/kg | Volumetric Energy Density: 234 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 beyond this range. Preferred range 10°C - 45°C
Discharging Temperature	-15°C	55°C	Battery cuts out beyond this range. 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 Detection	Yes	Yes, tapers reported current allowed
Over Discharge Detection	Yes	Yes, based on voltage and on SoC
Over Temperature Detection	Yes	Yes
Under Voltage Detection	Yes	Yes
Charge Limit Exceeded	Yes	Yes
Short Circuit	No	External fuse or DC breaker required

Note: Exceeding safety Parameters will disable the 24V battery OK output signal which can be used to open a HV circuit breaker or contactor.

## Low Voltage Interfaces

Serial	RS485 / USB	Isolated to 2500V
Battery OK	Isolated 24V DC output present if battery within safe limits. 24V can provide up to 6W of power	Isolated to 2500V

## 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

Industrial Gateway	Includes, GSM / CAN /RS485 / USB
Gateway Display	Industrial HMI for live state of battery view
Battery OK Interlock Board	Combines "N" battery OK module signals for full string protection. Gives out N*6W of power on 24VDC