

# The Evaluation Testing of Rechargeable Batteries

It is estimated that with the growth of the electric vehicle market and the progressing trend towards carbon neutrality, the battery market will reach \$220 billion by 2027.

The new PXB series of bidirectional high-capacity DC power supplies is an excellent choice for rechargeable battery charge/discharge applications.



## Key Features!

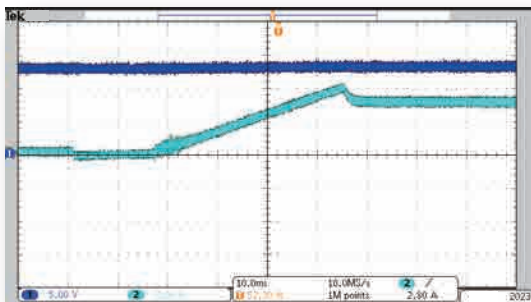
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*Bidirectional  
DC Power Supplies*

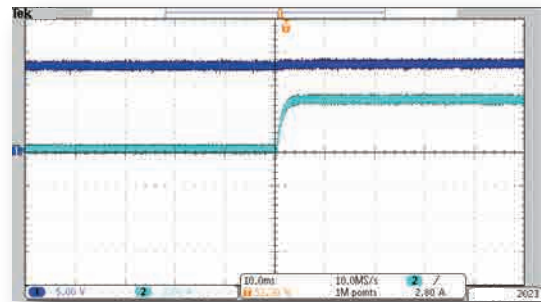
*PXB series*

### ● Output Priority Mode Smooths Rising Waveforms

When the output is turned on, the device can be set to start up as a constant voltage (CV) power supply or constant current (CC) power supply. Using CC priority mode during CC and CC-CV charging ensures a smooth start-up with no overshooting.



▲ Rising Current Waveform in CV Priority Mode



▲ Rising Current Waveform in CC Priority Mode

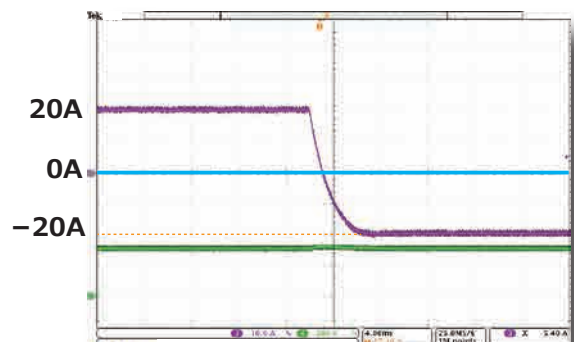
## Key Features!

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### ● Seamless Charging and Discharging

#### Can Be Easily Performed in DC SEAM Mode

In typical bidirectional power supplies, the voltage value of the DUT controls the current direction, so switching occurs when the current crosses zero. The PXB is equipped with SEAM mode, which allows current to flow in both directions without changing voltage values. This enables seamless control of battery charging and discharging.



▲ DC SEAM Mode

## Key Features!

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### ●Regenerative Power

The PXB series has a regenerative function that returns input power to the commercial power supply without converting it into heat. The regenerative efficiency of over 90 % enables efficient aging tests. Moreover, energy efficiency can be easily checked by simply looking at the regenerative power on the front panel.



Check the regenerative power on the front panel!

## Key Features!

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### ●Impedance Setting Function When the Output Is Off

In most DC power supplies, an internal discharge circuit can unnecessarily cause the battery to discharge when the output is turned off. However, the PXB allows the user to set the impedance when the output is turned off. By setting the impedance to high, current flow can be suppressed. This feature prevents unnecessary battery discharge.

*The PXB series, with output priority mode smoothing out the rising waveform and DC SEAM mode, is ideal for rechargeable battery charging and discharging.*

- High power density: 20 kW in 3U
- A single unit can handle both power and regeneration.
- Rated output voltage: 50V / 500V / 1000V / 1500V
- Models with 200 VAC (3-phase) or 400 VAC (3-phase) input voltage are available.
- Continuously operates at rated power, even at 50°C ambient temperatures.  
(Excluding some models)
- Support for parallel operation up to 10 units (200kW).
- Equipped with a touch panel display.
- LAN, USB, RS232C, and external analog control (isolated) come as standard.
- Regenerative function (on-site power grid)
- External control I/Os are standard for both NPN and PNP-type PLCs.

20kW

Maximum voltage  
1500V

3U  
Approx. 128 mm  
(5.04 inches)

## Lineup / Main Specifications

Model	Output			Ripple noise	Power fluctuation		Load variation	
	CV	CC *	Rated power	CV (rms)	CV	CC	CV	CC
PXB20K-50	0 V to 50 V	-800 A to +800 A	20 kW	30 mV	±10 mV	±1600 mA	±40 mV	±1600 mA
PXB20K-500	0 V to 500 V	-120 A to +120 A		250 mV	±100 mV	±240 mA	±250 mV	±240 mA
PXB20K-1000	0 V to 1000 V	-60 A to +60 A		500 mV	±200 mV	±120 mA	±500 mV	±120 mA
PXB20K-1500	0 V to 1500 V	-30 A to +30 A		750 mV	±300 mV	±60 mA	±750 mV	±60 mA

Model	Rise time / Fall time				Input current	Weight
	CV		CC		AC 200 V (3-phase 3-wire) / 400 V (3-phase 3-wire) * Select type at purchase. Switching is not possible.	
	Rise time	Fall time	Rise time (Short-circuit) (TYP)	Fall time (Short-circuit) (TYP)		Approx.
PXB20K-50	10 ms		5 ms		80 A / 40 A	41 kg (90.39 lbs)
PXB20K-500						38 kg (83.78 lbs)
PXB20K-1000						37 kg (81.57 lbs)
PXB20K-1500						37 kg (81.57 lbs)

\*The minimum voltage at which maximum sinking is possible is 2 % of the rated voltage.