选型指南

DC Power Supply and SMU Selection: Channels, Resolution and Accuracy

Selection guide for programmable DC power supplies and SMUs: the JXBY range covers SMM source meters, SPD multi-channel supplies and SPS wide-range switching supplies, with channels, resolution and set/readback accuracy compared.

Three series, three different roles



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Series	Positioning	Typical use
Source measurement unit (SMU)	SMU with integrated sourcing and measurement	Semiconductor characterization, nano-device and material testing
Programmable DC power supply	Multi-channel independent outputs	General lab power, production-line testing
Wide-range programmable DC switching supply	Wide-range programmable DC **switching** supply	High-power delivery with voltage/current combinations

Pick the series first, then the model — once this is fixed, the channel count and accuracy class below start to mean something.

Core specifications of the source meter

Published specifications of the JXBY-7201 series source measurement units:

- Channels: 1 (JXBY-7201) / 2 (JXBY-7202)
- Resolution: 10fA/100nV
- Reading resolution: 6½ digits
- Maximum output: ±210V/3.03A/31.8W
- Pulse capability: ±10.5A
- Sampling rate: 100,000 points/s

The 10fA/100nV resolution is the dividing line between a source meter and an ordinary supply — ordinary supplies only source, and 10fA-level measurement capability is the foundation for semiconductor I-V curves and device characterization.

The 100,000 points/s sampling rate determines whether you can do pulse testing and fast transient observation.

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How to decide channels on multi-channel supplies



For the SPD series the key parameters are each channel’ s output capability and the channel count. Published examples:

Model	Max per-channel current	Max per-channel voltage	Max output power	Channels
JXBY-7209	3.2 A	32 V	240 W	4
JXBY-7212	10 A	15 V	285 W	4
JXBY-7210	10 A	12 V	278 W	4
JXBY-7207	3.2 A	32 V	220 W	3

First compute the **total power requirement**, then check whether the **per-channel capability** covers the most demanding channel — common practice is to set the current headroom by the highest-load channel rather than configuring every channel to the maximum.

Two ways accuracy is specified

Power-supply accuracy usually comes as two values: **setting accuracy** and **readback accuracy**.

Published values for the JXBY-7209 series:

- Resolution: 1 mV/1 mA

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“of reading” means a percentage of the reading — a point often misread. For example, at a 10V setpoint, the voltage setting error = 10V × 0.03% + 10mV = 3mV + 10mV = 13mV. The larger the range, the smaller the percentage term’s share and the more the fixed term dominates.

How high-power models differ



The same series also has high-power tiers: the JXBY-7230 series delivers 1500W, uses a 3.12-inch OLED display, and supports independent, series and parallel output modes.

One published model: max per-channel current 120A, max per-channel voltage 40V, max output power 1500W, 1 channel, resolution 10 mV/10 mA, setting accuracy 0.2%±30mA (current) / 0.1%±10mV (voltage), readback accuracy 0.2%±40mA (current) / 0.1%±20mV (voltage).

Note that high-power tiers trade off resolution (10 mV/10 mA vs 1 mV/1 mA): **resolution and power cannot both be maximized** — an inherent trade-off in power supplies.

FAQ

Q What is the core difference between an SMU and an ordinary DC supply?

A An ordinary DC supply only sources voltage and current — measurement needs an external multimeter; an SMU sources and measures simultaneously, integrating a current source,

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Q How do I decide the channel count of a multi-channel supply?

A Compute the total power requirement first, then check whether per-channel capability covers the most demanding channel. In the programmable DC supply range, the SPD4000X is 3.2A/32V/240W with 4 channels, the SPD4323X is 10A/15V/285W with 4 channels, and the SPD3303C is 3.2A/32V/220W with 3 channels.

Q How should I read a power supply’ s accuracy figures?

A Look at two values: setting accuracy and readback accuracy, published as “±(percentage of reading + fixed value)”. For the JXBY-7209, voltage setting accuracy is ±(0.03% of reading+10)mV and current ±(0.3% of reading+10)mA. The percentage scales with the reading; on larger ranges the fixed term dominates.

Q Does resolution drop on high-power supplies?

A Yes — an inherent trade-off. High-power tiers like the JXBY-7230 series (1500W, max per-channel 120A/40V) offer 10 mV/10 mA resolution, while mid-power SPD4000X-series units offer 1 mV/1 mA. Resolution and output power must be balanced against actual needs.

This guide is based on the official product pages and solution descriptions /products/dc-power-supply-and-smu/. Parameters are quoted verbatim, without secondary processing.

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