

Precision Current Sources



- Extremely low-noise bipolar transistor technology
- Ultra-fast response time
- Precise control
- Up to 100 A
- Galvanic isolation (option)
- Battery supply (option)



HighFinesse
Laser and Electronic Systems

Precision Current Sources

The current sources of the series BCS (bipolar current source) and CCS (constant current source) from HighFinesse have been developed for precision experiments in the areas of quantum optics and atomic physics and are especially suitable for the technically demanding requirements in the area of physical basic research.

Power Features	
Types:	BCS-series: analog controlled, bipolar current generator with continuous sweep through zero. Bipolar transistor technology. CCS-series: analog controlled constant current generator. Bipolar transistor technology.
Power Range:	Up to 100 A. Supply: one/three phase mains voltage. Cooling: air/water cooling. Up to 10 mA. Supply: battery incl. recharge unit.
Specification:	Current- /voltage range individually as required.
Current Outputs:	Grounded or floated (adjustable).
Control:	Analog: with ± 10 V control voltage. Manual: 10-turn-potentiometer.
Trigger Characteristics:	Trigger sets the current to zero or changes between two current values. Configuration to interlock is possible.
Response Time:	Adjustable between 100 μ s und 100 ms.
Waviness of the Current:	$< 10^{-5}$ (characteristic multiplication factor).
Current Noise:	$\frac{I_{\text{nois}}(\text{RMS}) * R_{\text{max}}}{I_{\text{max}} * R_{\text{max}}} < -90$ dB (typically between -95 and -110 dB) due to careful electronic and mechanic design for noise protection.
Adjustment Accuracy:	0,1 % (of total amplitude) without Galvanic Isolation. 1 % (of total amplitude) with Galvanic Isolation.
Long-term Stability:	Better than 0.01 % in 120 h (standard error referring to the total amplitude).
Temperature Coefficient:	25 ppm/K
Monitor:	Calibrated monitor output for the measurement of the source current. LCD current display.
Case:	Standard 19" rack system.
Option: Galvanic Isolation	For the analog control port, monitor and trigger.
Option: Battery Set	For operation from batteries (up to 3 A).
Guarantee:	24 months guarantee by manufacturer, extended service options.

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Power Classes/Categories Current- and Voltage-Characteristics

High Finesse offers precision current sources of the BCS- and CCS-series in several power categories, within which the requested current- and voltage characteristics may be tuned individually (survey). The modular construction permits the individual control of the current and voltage ranges as well as response

times and inductive load capacity, and thus enables an optional tuning to the requirements.

On request, we offer current sources also with maximum current and voltage values beyond the standard power range listed below.



Standard BCS current source.
(Exact size depends on the power category.)

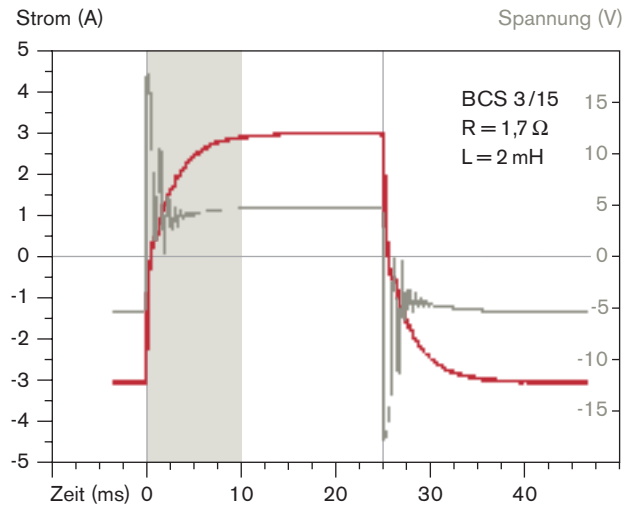
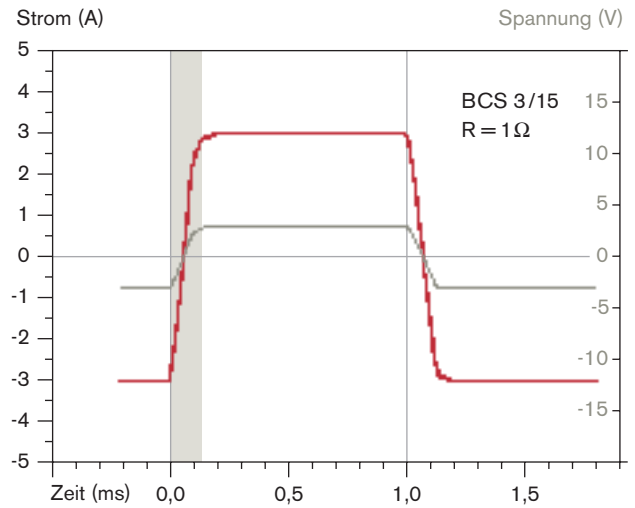
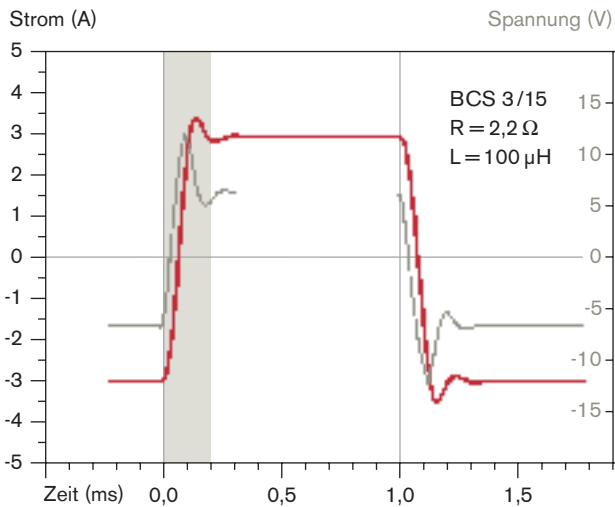


Battery supplied bipolar precision current source
with integrated recharge unit (up to 10mA).
Please request for separate data sheet.

Response Time

A fundamental requirement for current sources in scientific research is the short response time. The precision current sources of HighFinesse feature extremely short response times just as high stability.

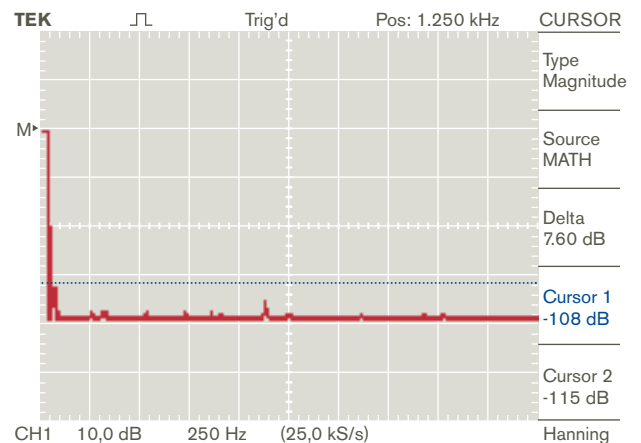
The diagrams show the measured typical behaviour at different loads.



Noise Spectrum

The use of current sources in precision-application requires high accuracy, stability and low-noise currents. Current sources by HighFinesse were designed to meet these requirements. The diagram shows the FFT-spectrum of the BCS 3/15 current source between 0 and 2500 Hz. The spectrum shows a noise level below -108 dB V_{RMS} .

Each device is tested carefully before delivery, so the switching time and noise characteristics are included in the manual.



The measurement was taken at 3A and an ohmic load of 1 Ω. Trigger: AC line; Average: 128.

Voltage noise <math>< 4/\mu V_{RMS}</math>.

Contact

We are pleased to accommodate your individual requirements concerning special features, response time, and accuracy. Furthermore, we offer current sources beyond our standard power ranges on request. We look forward to receiving your inquiry.



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