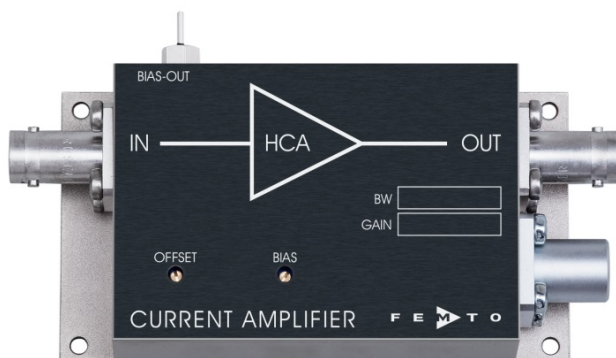


High-Speed Current Amplifier



Features	<ul style="list-style-type: none">• Bandwidth and Frequency Response Independent of Detector Capacitance (up to 15 pF)• Low Noise 490 fA/√Hz Equivalent Input Noise Current• Bandwidth DC ... 4 MHz• Transimpedance (Gain) 5 x 10⁵ V/A• Protection against ± 3.5 kV Transients																																																	
Applications	<ul style="list-style-type: none">• Photodiode and Photomultiplier Amplifier• Spectroscopy• Charge Amplifier• Ionisation Detectors• Preamplifier for Lock-Ins, A/D Converters, etc.																																																	
Specifications	<table><tr><td>Test Conditions</td><td>Vs = ± 15 V, Ta = 25°C</td></tr><tr><td>Gain</td><td><table><tr><td>Transimpedance</td><td>5 x 10⁵ V/A (@ 50 Ω load)</td></tr><tr><td>Gain Accuracy</td><td>± 1 %</td></tr></table></td></tr><tr><td>Frequency Response</td><td><table><tr><td>Lower Cut-Off Frequency</td><td>DC</td></tr><tr><td>Upper Cut-Off Frequency (- 3 dB)</td><td>4 MHz</td></tr><tr><td>Rise / Fall Time (10 % - 90 %)</td><td>90 ns</td></tr><tr><td>Gain Flatness</td><td>± 0.3 dB</td></tr></table></td></tr><tr><td>Input</td><td><table><tr><td>Equ. Input Noise Current</td><td>490 fA/√Hz (@ 100 kHz)</td></tr><tr><td>Equ. Input Noise Voltage</td><td>6 nV/√Hz (@ 100 kHz)</td></tr><tr><td>Input Bias Current</td><td>5 pA typ.</td></tr><tr><td>Input Bias Current Drift</td><td>Factor 1.7 / 10 K</td></tr><tr><td>Offset Current Compensation</td><td>± 4 µA adjustable by offset trimpot</td></tr><tr><td>Input Current Range</td><td>± 3 µA (for linear amplification)</td></tr><tr><td>Input Offset Voltage</td><td>2 mV</td></tr><tr><td>DC Input Impedance</td><td>50 Ω (virtual) // 5 pF</td></tr></table></td></tr><tr><td>Output</td><td><table><tr><td>Output Voltage Range</td><td>± 1.5 V (@ 50 Ω load) for linear operation and low harmonic distortion</td></tr><tr><td>Output Impedance</td><td>50 Ω (terminate with 50 Ω load for best performance)</td></tr></table></td></tr><tr><td>Bias Output</td><td><table><tr><td>Bias Output Voltage Range</td><td>± 12 V, adjustable by bias trimpot</td></tr><tr><td>Bias Output Impedance</td><td>10 kΩ // 1 µF</td></tr></table></td></tr></table>		Test Conditions	Vs = ± 15 V, Ta = 25°C	Gain	<table><tr><td>Transimpedance</td><td>5 x 10⁵ V/A (@ 50 Ω load)</td></tr><tr><td>Gain Accuracy</td><td>± 1 %</td></tr></table>	Transimpedance	5 x 10 ⁵ V/A (@ 50 Ω load)	Gain Accuracy	± 1 %	Frequency Response	<table><tr><td>Lower Cut-Off Frequency</td><td>DC</td></tr><tr><td>Upper Cut-Off Frequency (- 3 dB)</td><td>4 MHz</td></tr><tr><td>Rise / Fall Time (10 % - 90 %)</td><td>90 ns</td></tr><tr><td>Gain Flatness</td><td>± 0.3 dB</td></tr></table>	Lower Cut-Off Frequency	DC	Upper Cut-Off Frequency (- 3 dB)	4 MHz	Rise / Fall Time (10 % - 90 %)	90 ns	Gain Flatness	± 0.3 dB	Input	<table><tr><td>Equ. Input Noise Current</td><td>490 fA/√Hz (@ 100 kHz)</td></tr><tr><td>Equ. Input Noise Voltage</td><td>6 nV/√Hz (@ 100 kHz)</td></tr><tr><td>Input Bias Current</td><td>5 pA typ.</td></tr><tr><td>Input Bias Current Drift</td><td>Factor 1.7 / 10 K</td></tr><tr><td>Offset Current Compensation</td><td>± 4 µA adjustable by offset trimpot</td></tr><tr><td>Input Current Range</td><td>± 3 µA (for linear amplification)</td></tr><tr><td>Input Offset Voltage</td><td>2 mV</td></tr><tr><td>DC Input Impedance</td><td>50 Ω (virtual) // 5 pF</td></tr></table>	Equ. Input Noise Current	490 fA/√Hz (@ 100 kHz)	Equ. Input Noise Voltage	6 nV/√Hz (@ 100 kHz)	Input Bias Current	5 pA typ.	Input Bias Current Drift	Factor 1.7 / 10 K	Offset Current Compensation	± 4 µA adjustable by offset trimpot	Input Current Range	± 3 µA (for linear amplification)	Input Offset Voltage	2 mV	DC Input Impedance	50 Ω (virtual) // 5 pF	Output	<table><tr><td>Output Voltage Range</td><td>± 1.5 V (@ 50 Ω load) for linear operation and low harmonic distortion</td></tr><tr><td>Output Impedance</td><td>50 Ω (terminate with 50 Ω load for best performance)</td></tr></table>	Output Voltage Range	± 1.5 V (@ 50 Ω load) for linear operation and low harmonic distortion	Output Impedance	50 Ω (terminate with 50 Ω load for best performance)	Bias Output	<table><tr><td>Bias Output Voltage Range</td><td>± 12 V, adjustable by bias trimpot</td></tr><tr><td>Bias Output Impedance</td><td>10 kΩ // 1 µF</td></tr></table>	Bias Output Voltage Range	± 12 V, adjustable by bias trimpot	Bias Output Impedance	10 kΩ // 1 µF
Test Conditions	Vs = ± 15 V, Ta = 25°C																																																	
Gain	<table><tr><td>Transimpedance</td><td>5 x 10⁵ V/A (@ 50 Ω load)</td></tr><tr><td>Gain Accuracy</td><td>± 1 %</td></tr></table>	Transimpedance	5 x 10 ⁵ V/A (@ 50 Ω load)	Gain Accuracy	± 1 %																																													
Transimpedance	5 x 10 ⁵ V/A (@ 50 Ω load)																																																	
Gain Accuracy	± 1 %																																																	
Frequency Response	<table><tr><td>Lower Cut-Off Frequency</td><td>DC</td></tr><tr><td>Upper Cut-Off Frequency (- 3 dB)</td><td>4 MHz</td></tr><tr><td>Rise / Fall Time (10 % - 90 %)</td><td>90 ns</td></tr><tr><td>Gain Flatness</td><td>± 0.3 dB</td></tr></table>	Lower Cut-Off Frequency	DC	Upper Cut-Off Frequency (- 3 dB)	4 MHz	Rise / Fall Time (10 % - 90 %)	90 ns	Gain Flatness	± 0.3 dB																																									
Lower Cut-Off Frequency	DC																																																	
Upper Cut-Off Frequency (- 3 dB)	4 MHz																																																	
Rise / Fall Time (10 % - 90 %)	90 ns																																																	
Gain Flatness	± 0.3 dB																																																	
Input	<table><tr><td>Equ. Input Noise Current</td><td>490 fA/√Hz (@ 100 kHz)</td></tr><tr><td>Equ. Input Noise Voltage</td><td>6 nV/√Hz (@ 100 kHz)</td></tr><tr><td>Input Bias Current</td><td>5 pA typ.</td></tr><tr><td>Input Bias Current Drift</td><td>Factor 1.7 / 10 K</td></tr><tr><td>Offset Current Compensation</td><td>± 4 µA adjustable by offset trimpot</td></tr><tr><td>Input Current Range</td><td>± 3 µA (for linear amplification)</td></tr><tr><td>Input Offset Voltage</td><td>2 mV</td></tr><tr><td>DC Input Impedance</td><td>50 Ω (virtual) // 5 pF</td></tr></table>	Equ. Input Noise Current	490 fA/√Hz (@ 100 kHz)	Equ. Input Noise Voltage	6 nV/√Hz (@ 100 kHz)	Input Bias Current	5 pA typ.	Input Bias Current Drift	Factor 1.7 / 10 K	Offset Current Compensation	± 4 µA adjustable by offset trimpot	Input Current Range	± 3 µA (for linear amplification)	Input Offset Voltage	2 mV	DC Input Impedance	50 Ω (virtual) // 5 pF																																	
Equ. Input Noise Current	490 fA/√Hz (@ 100 kHz)																																																	
Equ. Input Noise Voltage	6 nV/√Hz (@ 100 kHz)																																																	
Input Bias Current	5 pA typ.																																																	
Input Bias Current Drift	Factor 1.7 / 10 K																																																	
Offset Current Compensation	± 4 µA adjustable by offset trimpot																																																	
Input Current Range	± 3 µA (for linear amplification)																																																	
Input Offset Voltage	2 mV																																																	
DC Input Impedance	50 Ω (virtual) // 5 pF																																																	
Output	<table><tr><td>Output Voltage Range</td><td>± 1.5 V (@ 50 Ω load) for linear operation and low harmonic distortion</td></tr><tr><td>Output Impedance</td><td>50 Ω (terminate with 50 Ω load for best performance)</td></tr></table>	Output Voltage Range	± 1.5 V (@ 50 Ω load) for linear operation and low harmonic distortion	Output Impedance	50 Ω (terminate with 50 Ω load for best performance)																																													
Output Voltage Range	± 1.5 V (@ 50 Ω load) for linear operation and low harmonic distortion																																																	
Output Impedance	50 Ω (terminate with 50 Ω load for best performance)																																																	
Bias Output	<table><tr><td>Bias Output Voltage Range</td><td>± 12 V, adjustable by bias trimpot</td></tr><tr><td>Bias Output Impedance</td><td>10 kΩ // 1 µF</td></tr></table>	Bias Output Voltage Range	± 12 V, adjustable by bias trimpot	Bias Output Impedance	10 kΩ // 1 µF																																													
Bias Output Voltage Range	± 12 V, adjustable by bias trimpot																																																	
Bias Output Impedance	10 kΩ // 1 µF																																																	

High-Speed Current Amplifier

Specifications (continued)

Power Supply

Supply Voltage $\pm 15\text{ V}$
 Supply Current $\pm 50\text{ mA typ.}$
 (depends on operating conditions, recommended power supply capability minimum $\pm 150\text{ mA}$)

Case

Weight 210 g (0.5 lbs)
 Material AlMg4.5Mn, nickel-plated

Temperature Range

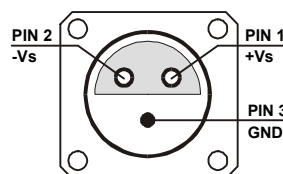
Storage Temperature $-40 \dots +100\text{ }^{\circ}\text{C}$
 Operating Temperature $0 \dots +60\text{ }^{\circ}\text{C}$

Absolute Maximum Ratings

Input Voltage $\pm 5\text{ V}$
 Input Voltage Transient $\pm 3.5\text{ kV}$ (pulsewidth 10 ns)
 Power Supply Voltage $\pm 22\text{ V}$

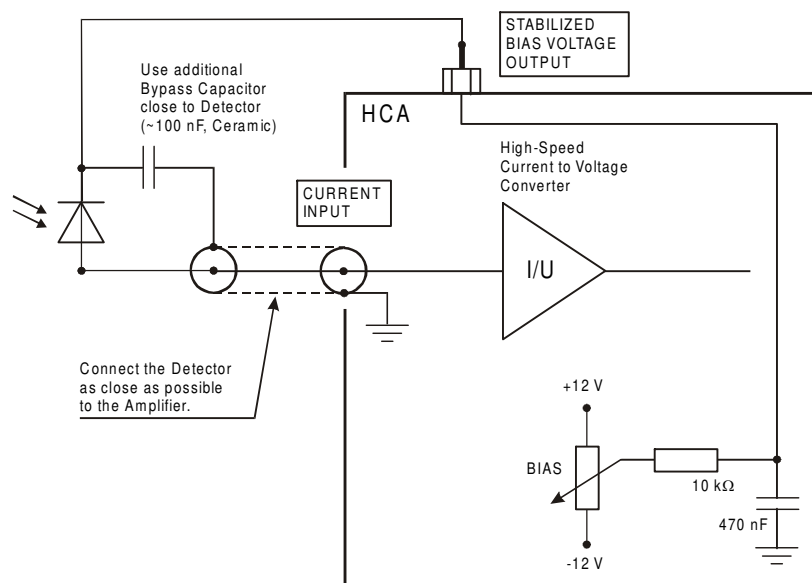
Connectors

Input BNC
 Output BNC
 Power Supply LEMO series 1S, 3-pin fixed socket
 Pin 1: $+15\text{ V}$
 Pin 2: -15 V
 Pin 3: GND



Application Diagrams

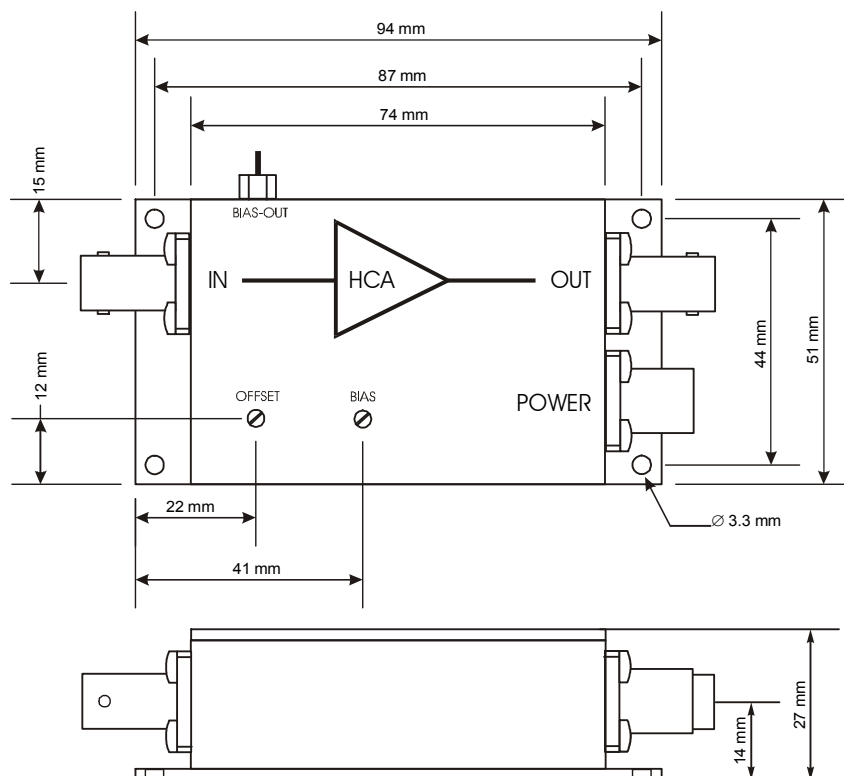
Photo Detector Biasing in Photoconductive Mode:
 Best choice for high speed applications and optimum signal to noise performance.



AZ01-0201-20

High-Speed Current Amplifier

Dimensions



DZ01-0201-22

FEMTO Messtechnik GmbH
Klosterstr. 64
10179 Berlin · Germany
Phone: +49 30 280 4711-0
Fax: +49 30 280 4711-11
Email: info@femto.de
www.femto.de

Specifications are subject to change without notice. Information provided herein is believed to be accurate and reliable. However, no responsibility is assumed by FEMTO Messtechnik GmbH for its use, nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of FEMTO Messtechnik GmbH. Product names mentioned may also be trademarks used here for identification purposes only.

© by FEMTO Messtechnik GmbH · Printed in Germany