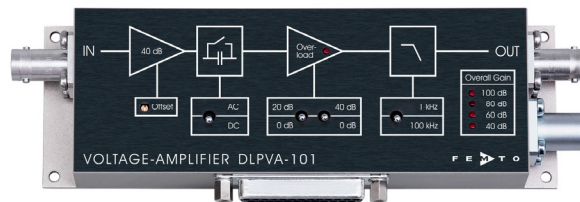


Datasheet

DLPVA-101-BLN-S

Variable Gain
Low-Frequency Voltage Amplifier



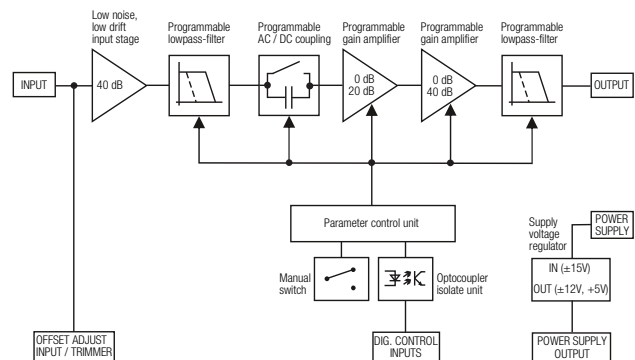
Features

- Variable gain 40 to 100 dB, switchable in 20 dB steps
- Bipolar input stage, recommended for low impedance sources less than 100 Ω
- DC-coupled, single ended
- Very low input voltage noise down to 700 pV/√Hz
- Bandwidth DC – 100 kHz, switchable to 1 kHz
- 0.5 μV/°C DC-drift
- Switchable AC/DC-coupling
- Local and remote control

Applications

- Low-noise laboratory amplifier
- Pulsed thermal EMF analysis
- Industrial sensors
- Detector preamplifier
- Integrated measurement systems



Block Diagram



BS-DLPVA-BLN-S_R01

SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



Datasheet		DLPVA-101-BLN-S
Variable Gain Low-Frequency Voltage Amplifier		
Intended Use	<p>The DLPVA-101-BLN-S voltage amplifier is a variable gain voltage amplifier. It is designed for fast amplification of small voltage signals. Operation is largely self-explanatory. If in doubt, consult this document or contact support@femto.de.</p> <p>For safe operation, please refer to the damage thresholds specified in the "Absolute Maximum Ratings", "Temperature Range" and "Power Supply" sections of this document.</p> <p>The operating environment must be free of smoke, dust, grease, oil, condensing moisture, and other contaminants that could affect the operation or performance.</p>	
Application Notes	<p>The DLPVA-101-BLN-S amplifier is designed for use with low resistance sources up to 100 Ω. A high source resistance causes significant increase of the input offset voltage and may trigger overload status. See "Overload LED" section for details.</p>	
Available Version	DLPVA-101-BLN-S	Variable gain voltage amplifier, gain settings 40/60/80/100 dB, single ended (bipolar), typical source resistance <100 Ω, input 1 MΩ (BNC), bandwidth DC/1.5 Hz – 1/100 kHz
Related Models	DLPVA-101-B-S	Variable gain voltage amplifier, gain settings 20/40/60/80 dB, single ended (bipolar), typical source resistance <1 kΩ, input 1 MΩ (BNC), bandwidth DC/1.5 Hz – 1/100 kHz
	DLPVA-101-B-D	Variable gain voltage amplifier, gain settings 20/40/60/80 dB, true differential (bipolar), typical source resistance <10 kΩ, input 1 MΩ (LEMO®), bandwidth DC/1.5 Hz – 1/100 kHz
	DLPVA-101-F-S	Variable gain voltage amplifier, gain settings 20/40/60/80 dB, single ended (FET), typical source resistance <1 MΩ, input 1 TΩ (BNC), bandwidth DC/1.5 Hz – 1/100 kHz
	DLPVA-101-F-D	Variable gain voltage amplifier, gain settings 20/40/60/80 dB, true differential (FET), typical source resistance <1 MΩ, input 1 TΩ (LEMO®), bandwidth DC/1.5 Hz – 1/100 kHz
	DLPVA-100-BUN-S	Ultra-low-noise variable gain voltage amplifier, gain settings 40/60/80/100 dB, single ended (bipolar), typical source resistance <50 Ω, input 1 kΩ (BNC), bandwidth 1.5 Hz – 1/100 kHz
Available Accessories	<p>PS-15-25-L</p> 	<p>Power Supply Input: AC 100 – 240 V Output: DC ±15 V</p>
	<p>LUCI-10</p> 	<p>Compact digital I/O interface for USB remote control, supports opto-isolation of amplifier signal path from PC USB port, 16 digital outputs, 3 opto-isolated digital inputs, bus-powered operation</p>
SOPHISTICATED TOOLS FOR SIGNAL RECOVERY		F E M T O

Datasheet

DLPVA-101-BLN-S

**Variable Gain
Low-Frequency Voltage Amplifier**

Specifications	Test conditions	$V_S = \pm 15\text{ V}$, $T_A = 25\text{ }^\circ\text{C}$, output load impedance $1\text{ M}\Omega$, warm-up 20 minutes (min. 10 minutes recommended)
Gain	Gain values	40, 60, 80, 100 dB indicated by LEDs, (@ output load $\geq 100\text{ k}\Omega$)
	Gain accuracy	$\pm 0.05\text{ dB}$
Frequency Response	Lower cut-off frequency	DC / 1.5 Hz, switchable
	Upper cut-off frequency (-3 dB)	100 kHz / 1 KHz, switchable
	Upper cut-off frequency roll-off	12 dB/oct.
Time Response	Rise/fall time (10 % - 90 %)	3.5 μs (@ bandwidth 100 kHz)
		350 μs (@ bandwidth 1 kHz)
Input	Input impedance	$1\text{ M}\Omega \parallel 13\text{ pF}$
	Input voltage drift	$0.5\text{ }\mu\text{V}/^\circ\text{C}$
	Equ. input noise voltage	gain settings
		noise
Output	40 dB	0.8 nV/ $\sqrt{\text{Hz}}$
	60, 80, 100 dB	0.7 nV/ $\sqrt{\text{Hz}}$
	Equ. input noise current	3 pA/ $\sqrt{\text{Hz}}$
	1/f-noise corner	80 Hz
	Input bias current	1 μA
	Input bias current drift	8 nA/ $^\circ\text{C}$
	Input offset voltage	$\pm 0.5\text{ mV}$, adjustable by offset trimmer and external control voltage
	Output voltage range	$\pm 10\text{ V}$ (@ $\geq 100\text{ k}\Omega$ output load)
	Output impedance	$50\text{ }\Omega$ (terminate with $\geq 100\text{ k}\Omega$ load for best performance)
	Max. output current	$\pm 20\text{ mA}$ (short-circuit proof)
Output overload recovery time	0.5 ms (after 20 x overload)	
Overload LED	<p>The amplifier features a LED to indicate an overload condition. The Overload LED will turn on if the signal level within the signal path exceeds the linear operating range. In order to ensure the correct operation of the amplifier without signal distortions reduce the gain setting until the Overload LED turns off.</p> <p>The Overload LED may also turn on when the amplifier is operated with open input or with a high source resistance, e. g. external AC coupling. In this case the bias current may cause a considerable input voltage. For proper operation please use a source resistance of less than $100\text{ }\Omega$ or switch to a lower gain setting.</p>	
Digital Control	Control input voltage range	Low: $-0.8 \dots +0.8\text{ V}$ High: $+1.8 \dots +12\text{ V}$, TTL / CMOS compatible
	Control input current	0 mA @ 0 V, 1.5 mA @ +5 V, 4.5 mA @ +12 V
	Overload output	Non active: +5 V, max. 1 mA, active: 0.8 V, max. -10 mA
Ext. Offset Control	Offset control voltage range	$\pm 10\text{ V}$ (+10 V corresponds to +0.5 mV input offset voltage)
	Offset control input impedance	$200\text{ k}\Omega$
Power Supply	Supply voltage	DC $\pm 15\text{ V}$ ($\pm 14.5\text{ V}$ to $\pm 16\text{ V}$)
	Supply current	$\pm 75\text{ mA}$ typ. (depends on operating conditions, recommended power supply capability min. $\pm 150\text{ mA}$)
Case	Weight	320 g (0.7 lbs)
	Material	AlMg4.5Mn, nickel-plated
Temperature Range	Storage temperature	$-40\text{ }^\circ\text{C} \dots +80\text{ }^\circ\text{C}$
	Operating temperature	$0\text{ }^\circ\text{C} \dots +60\text{ }^\circ\text{C}$

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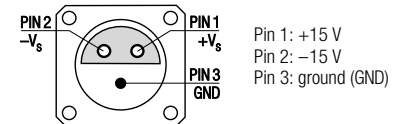
Datasheet

DLPVA-101-BLN-S

**Variable Gain
Low-Frequency Voltage Amplifier**

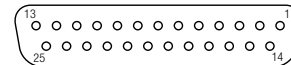
Absolute Maximum Ratings	Digital control input voltage $-5\text{ V}/+16\text{ V}$ relative to digital ground DGND (pin 9) Analog control input voltage $\pm 15\text{ V}$ relative to analog ground AGND (pin 3) Power supply voltage $\pm 20\text{ V}$ Signal Input voltage $\pm 0.7\text{ V}$ Overvoltage at the signal input can severely degrade the noise performance or destroy the amplifier!
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Connectors	Input BNC jack (female) Output BNC jack (female) Power supply LEMO® series 1S, 3-pin fixed socket (mating plug type: FFA.1S.303.CLAC52)
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Control port

Sub-D 25-pin, female, qual. class 2



- Pin 1: +12 V (stabilized power supply output*)
- Pin 2: -12 V (stabilized power supply output*)
- Pin 3: AGND (analog ground for pins 1 – 8)
- Pin 4: +5 V (stabilized power supply output*)
- Pin 5: digital output: overload (referred to pin 3)
- Pin 6: NC
- Pin 7: NC
- Pin 8: input offset control voltage
- Pin 9: DGND (ground for digital control pins 10 – 14)
- Pin 10: NC
- Pin 11: digital control input: gain, LSB
- Pin 12: digital control input: gain, MSB
- Pin 13: digital control input: AC/DC
- Pin 14: digital control input: 100kHz / 1 kHz
- Pin 15 – 25: NC

*stabilized power supply output current
 $\pm 12\text{ V}$: max. $\pm 100\text{ mA}$
 $+5\text{ V}$: max. 50 mA

SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



Datasheet

DLPVA-101-BLN-S

**Variable Gain
Low-Frequency Voltage Amplifier**

Remote Control Operation

General

Remote control input bits are opto-isolated and connected by logical OR function to local switch settings. For remote control set the corresponding local switches to "0 dB", "AC" and "1 kHz" and select the wanted setting via a bit code at the corresponding digital inputs.

Mixed operation, e.g. local gain setting and remote controlled bandwidth setting, is also possible.

Gain setting

Gain	Pin 11 LSB	Pin 12 MSB
40 dB	low	low
60 dB	high	low
80 dB	low	high
100 dB	high	high

AC/DC setting

Coupling	Pin 13
AC	low
DC	high

Bandwidth setting

Bandwidth	Pin 14
1 kHz	low
100 kHz	high

Scope of Delivery

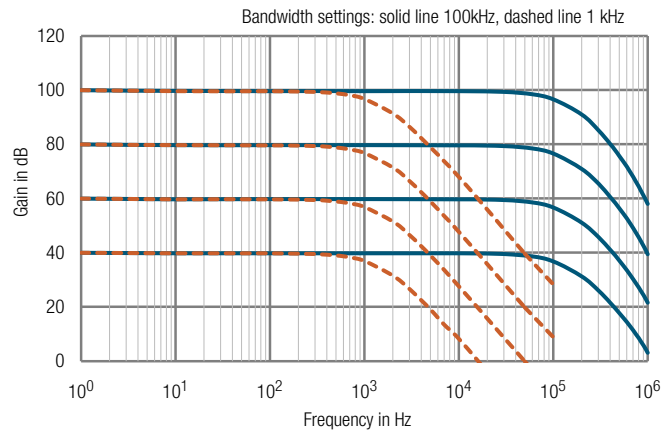
DLPVA-101-BLN-S, LEMO® 3-pin connector, datasheet, transport package

Ordering Information

DLPVA-101-BLN-S Variable gain voltage amplifier, single ended (bipolar)

Typical Performance
Characteristics

DLPVA-101-BLN-S frequency response



SOPHISTICATED TOOLS FOR SIGNAL RECOVERY



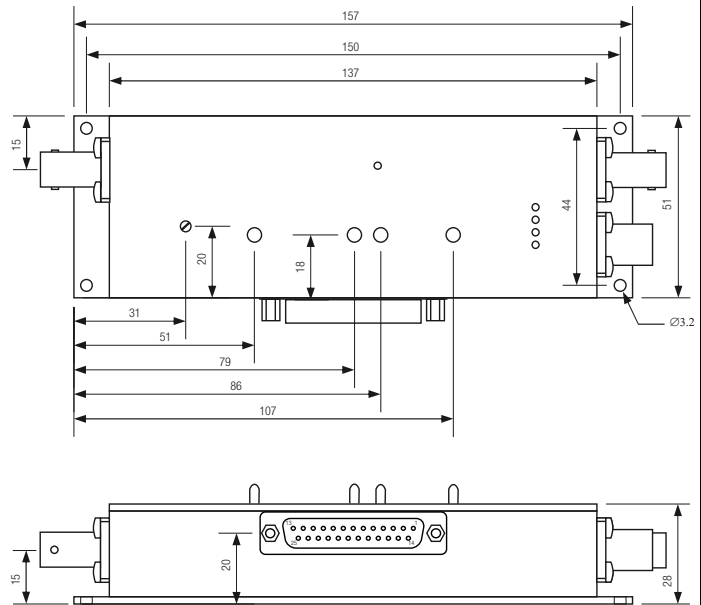
Datasheet

DLPVA-101-BLN-S

**Variable Gain
Low-Frequency Voltage Amplifier**

Dimensions

DLPVA-101-BLN-S



DZ-DLPVA-101-BLNS-B-F-S_R01

all dimensions in mm unless otherwise noted

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