

Datasheet

DLPVA-500-B

Variable Gain Low-Frequency Voltage Amplifier



The picture shows model DLPVA-500-B-S with BNC input

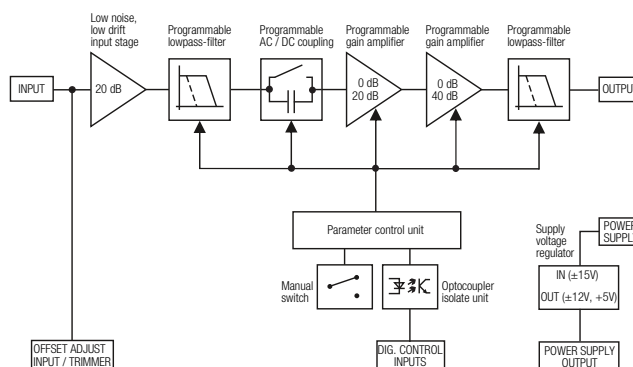
Features

- Variable gain 20 to 80 dB, switchable in 20 dB steps
- Bipolar input stage, recommended for low impedance sources less than 1 k Ω
- Single ended and true differential input models
- Bandwidth DC – 500 kHz, switchable to 1 kHz
- 0.7 μ V/°C DC-drift
- 120 dB CMRR
- Down to 2.0 nV/ $\sqrt{\text{Hz}}$ input noise
- Switchable AC/DC-coupling
- Local and remote control

Applications

- Universal laboratory amplifier
- Automated measurements
- Industrial sensors
- Detector preamplifier
- Integrated measurement systems

Block Diagram



BS-DLPVA-B-F_R01

SOPHISTICATED TOOLS FOR SIGNAL RECOVERY

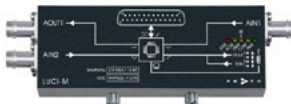
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Datasheet

DLPVA-500-B

Variable Gain Low-Frequency Voltage Amplifier

Intended Use	The DLPVA-500-B voltage amplifiers are variable gain voltage amplifiers. They are designed for fast amplification of small voltage signals. Operation is largely self-explanatory. If in doubt, consult this document or contact support@femto.de. For safe operation, please refer to the damage thresholds specified in the "Absolute Maximum Ratings", "Temperature Range" and "Power Supply" sections of this document. The operating environment must be free of smoke, dust, grease, oil, condensing moisture, and other contaminants that could affect the operation or performance.	
Application Notes	The DLPVA-500-B amplifiers are designed for use with low resistance sources. A high source resistance causes significant increase of the input offset voltage and may trigger overload status. See "Overload LED" section for details. When using a DLPVA-500-B-D with differential input, ensure that the common mode voltage, relative to the amplifier case, does not exceed the allowable range of ± 8 V. A floating source, such as an induction coil, without any connection to the amplifier ground will trigger the overload status as well.	
Available Versions	DLPVA-500-B-S DLPVA-500-B-D	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 – 1/500 kHz 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 – 1/500 kHz
Related Models	DLPVA-500-BLN-S DLPVA-500-F-S DLPVA-500-F-D	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 – 1/450 kHz 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 – 1/500 kHz 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 – 1/500 kHz
Available Accessories	PS-15-25-L  LUCI-10  LUCI-M 	Power Supply Input: AC 100 – 240 V Output: DC ± 15 V 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 Compact, universal USB system for data acquisition (DAQ) and control, up to 4 parallel 16 bit ADC channels with 2.5 MS/s, 3 12 bit DAC channels, 24 digital I/O s galvanic isolation from computer

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Available Accessories
(continued)

CAB-HF1


Double shielded high performance cables,
minimizes ground related noise, designed for
precise measurement of small signals

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

20, 40, 60, 80 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)

500 kHz / 1 kHz, switchable

Upper cut-off frequency roll-off

12 dB/oct.

Time Response
Rise/fall time (10 % - 90 %)

0.7 μs (@ bandwidth 500 kHz)

350 μs (@ bandwidth 1 kHz)

Input
Input impedance
 $1\text{ M}\Omega \parallel 105\text{ pF}$
Input voltage drift

0.7 $\mu\text{V}/^\circ\text{C}$
Equ. input noise voltage

gain settings

DLPVA-500-B-S

DLPVA-500-B-D

20 dB

5.0 nV/ $\sqrt{\text{Hz}}$

5.0 nV/ $\sqrt{\text{Hz}}$

40, 60, 80 dB

2.0 nV/ $\sqrt{\text{Hz}}$

3.0 nV/ $\sqrt{\text{Hz}}$
Equ. input noise current

2 pA/ $\sqrt{\text{Hz}}$
1/f-noise corner

80 Hz

Input bias current

0.8 μA
Input bias current drift

6 nA/ $^\circ\text{C}$
Input offset voltage
 $\pm 4\text{ mV}$, adjustable by offset trimmer and external contr. voltage

True differential input, model "DLPVA-500-B-D" only:
Common mode voltage range
 $\pm 8\text{ V}$
CMRR

120 dB (@ 100 Hz)

100 dB (@ 10 kHz)

80 dB (@ 60 kHz)

Output
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)

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beyond borders

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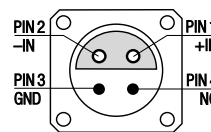
Variable Gain Low-Frequency Voltage Amplifier

Connectors

Input

Model DLPVA-500-B-S
BNC jack (female)

Model DLPVA-500-B-D
LEMO® series 1S, 4-pin fixed socket
(mating plug type: FFA.1S.304.CLAC52)



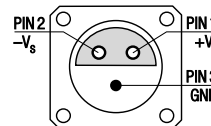
Pin 1: non inverting input
Pin 2: inverting input
Pin 3: ground (GND)
Pin 4: not connected (NC)

Output

BNC jack (female)

Power supply

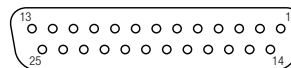
LEMO® series 1S, 3-pin fixed socket
(mating plug type: FFA.1S.303.CLAC52)



Pin 1: +15 V
Pin 2: -15 V
Pin 3: ground (GND)

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: 500kHz / 1 kHz
Pin 15 – 25: NC

*stabilized power supply output current
±12 V: max. ±100 mA
+5V: max. 50 mA

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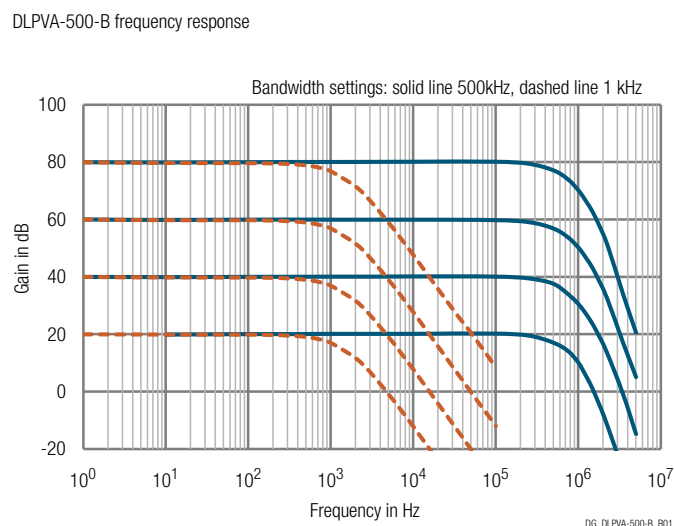
Variable Gain Low-Frequency Voltage Amplifier

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
		20 dB	low	low
		40 dB	high	low
		60 dB	low	high
AC/DC setting		80 dB	high	high
	AC/DC setting	Coupling	Pin 13	
		AC	low	
Bandwidth setting		DC	high	
		Bandwidth	Pin 14	
		1 kHz	low	
		500 kHz	high	

Scope of Delivery	DLPVA-500-B, LEMO® 3-pin connector, LEMO® 4-pin connector (model DLPVA-500-B-D only), datasheet, transport package			
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Ordering Information	DLPVA-500-B-S	Variable gain voltage amplifier, single ended (bipolar)
	DLPVA-500-B-D	Variable gain voltage amplifier, true differential (bipolar)

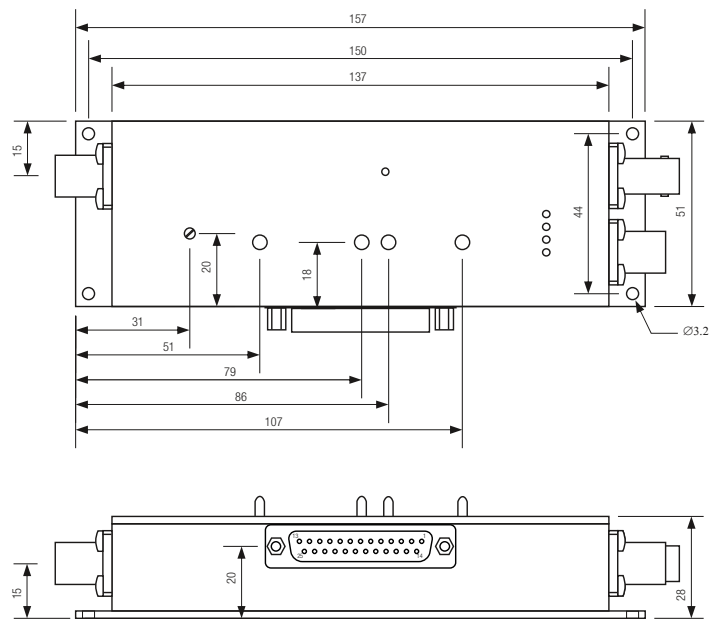
Typical Performance Characteristics



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Dimensions
DLPVA-500-B-D


DZ-DLPVA-500-B-F-D_R01

all dimensions in mm unless otherwise noted

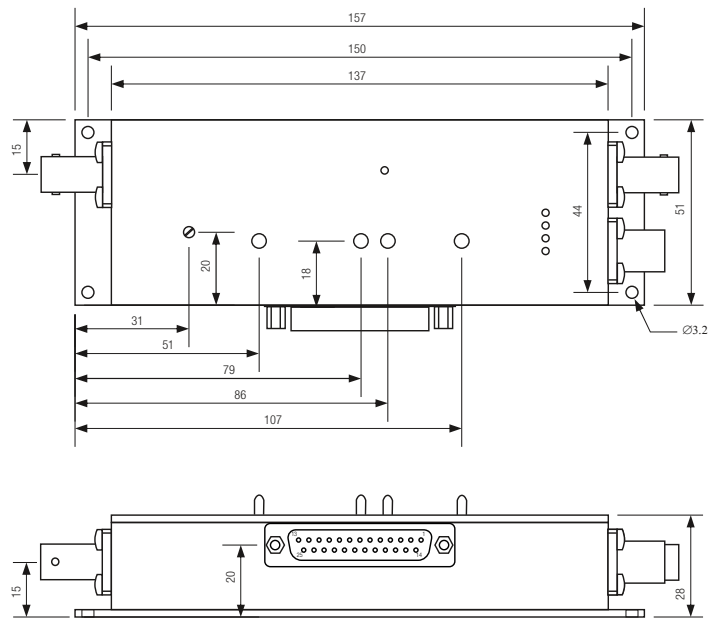
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Dimensions continued

DLPVA-500-B-S



DZ-DLPVA-500-BLN-B-F-S_R01

all dimensions in mm unless otherwise noted

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