HA61GD-3B30

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DUAL CHANNEL ±3kV, ±30mA / ±40mA$_P$
PRECISION PROGRAMMABLE HIGH VOLTAGE AMPLIFIER
WITH INTEGRATED SIGNAL GENERATOR

FEATURES

- Dual Channel
- ±3000V / ±30mA
- Integrated DDS/ARB Signal Generator
- High Precision, High Stability
- Programmable Current Limit
- High Speed
- Inhibit Input
- V/I Monitor Outputs
- Interlock Input and HV OFF Button

APPLICATIONS

- Materials Research
- Piezo Poling
- EAP
- ER Fluids
- Emulsion separation
- Electrostatic Deflection
- General High Voltage Testing

The **HA61GD-3B30** is a dual channel fast precision high voltage amplifier with integrated signal generator in a 19" rack mountable case. This single channel amplifier provides output voltages of -3000V to +3000V at ±30mA (static) and 40mA$_P$ (dynamic). The dynamic output current is available for signal frequencies down to 1Hz.

The amplifier features high precision, high stability and low noise. It is suitable to drive capacitive and resistive-capacitive loads. The output is stable with any capacitive load and also stable at no load conditions. It can easily drive loads like Piezo elements, EAP actuators, electrorheological fluid elements, electrostatic deflection electrodes and many other loads.

Power bandwidth and slew rate depend on the actual load capacitance.

Both amplifier channels feature identical specifications and interfaces.

A differential ±10V amplifier input prevents any ground loops and provides excellent noise suppression.
The voltage gain is fixed to 300, voltage and current monitor outputs and a TTL compatible INHIBIT input are provided.

The maximum output current can be limited to programmable values and programmable behavior. When the output current reaches the threshold the output will either shut down or the output current will be limited to the set value.

Internal high voltage sources feed the output stage. The output stage is protected against overload, short circuit, over temperature and high voltage arcing. The amplifier outputs are made available via SHV high voltage connectors. Operational and overload conditions are being displayed on the front panel.

A safety interlock circuit is provided to integrate the unit into an emergency shutdown circuit. When the interlock loop is open, the internal high voltage sources are being shut down. In addition to the interlock input a red HV OFF palm button is available on the front panel. The red indicator lamp HV ON signals that the internal high voltage sources are switched on.

A command interface is available via USB and Ethernet interfaces to control the amplifier. Monitor values of output voltage, output current as well as internal operational parameters can be read.

An implemented DDS/ARB signal generator is provided to generate standard waveforms like sinewave, trapezoid, squarewave, pulse, sawtooth and noise as well as fully arbitrary waveshapes. Parameters like waveform, amplitude, frequency, duty cycle, rise/fall time, offset, DC value, current limit and further functional parameters are controllable via the command interface.

Customized and full custom models are available on request.

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TECHNICAL DATA

Output Voltage:	-3000V ... +3000V
Output Current:	±30mA / ±40mA$_P$
Full Power Bandwidth:	> DC ... > 15kHz @ C_L=50pF (1% distortion limit) *
Small Signal Bandwidth:	> DC ... > 50kHz @ C_L=50pF *
Slew-Rate:	> 500V/µs @ C_L=0 * > 300V/µs @ C_L=50pF
Noise:	< 50mV$_{RMS}$ @ C_L=500pF (10Hz ... 50kHz) *
Control Input:	±10V (10V ≙ 3000V), BNC, R_I = 50kΩ
DC-Gain:	300 ±0.3%
Offset Voltage (RTO):	< ±50mV
Monitor Output (V):	±10V (10V ≙ 3000V ±0.3%), BNC
Monitor Output (I):	±10V (10V ≙ 100mA ±0.5%), BNC
Interlock:	24V, internally fed, Combicon
INHIBIT Input:	TTL compatible, BNC
Output Connector:	HV Connector An output cable of 2m length is included.

Output GND is connected the chassis and protective earth

Cooling:	temperature controlled fans
Line Voltage:	100 - 240V$_{AC}$ ±10% 50/60Hz
Power Consumption:	ca. 400VA (6000V$_{PP}$, 15kHz, C_L= 50pF)
Ambient Temperature:	Operation: 0 - +40°C Storage: -25 – +70°C
Dimensions (d x w x h):	ca. 450 x 449/480 x 133mm³ (19" / 3U)
Weight:	ca. 25kg
Safety:	according to EN 61010-1, CE
EMC:	according to EN 61326-1, CE

* Bandwidth, slew rate and output noise are depending on the size of the capacitive load. The coaxial output cable is part of the capacitive load and will reduce slew rates and large signal bandwidth. A typical coaxial cable has a capacitance of approx. 100pF/m.
Increasing the load capacitance reduces output noise.

Safety Advice

Design, installation and inspection of machinery and devices carrying high voltage require accordingly trained and qualified personnel. Appropriate safety rules and directives must be complied with.
Improper handling of high voltage can mean severe injuries or death and may cause serious collateral damage!

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