



LIAM 6005

5A@60V Bipolar Linear Amplifier

Linear bipolar current-controlled power supply rated at 300W output power (5A@60V) in a single 19"-2U crate.

Especially designed to operate in particle accelerator facilities.

Two different operation modes: high- and low- resistive load configurations guarantee higher reliability and efficiency.

Features

- 300W linear-type output stage
- True zero-crossing bipolar operation
- Low-noise
- High stability
- Ethernet connectivity
- Internal protection circuits
- Analog current monitor
- Three-phase AC input
- Low- and high-resistive load operation modes
- Local display for current and voltage monitoring
- External configurable interlocks
- Internal forced air cooling
- EPICS - ready

Applications

- Magnet Power Supplies
- Accelerator Machine Power Supplies
- Current Waveform Generation

The LIAM (Linear Amplifier Module) is a compact linear current-controlled power supply unit with a $\pm 5\text{A} @ \pm 60\text{V}$ rated output capability.

This system is designed in order to have true bipolar operation – i.e. real zero-crossing – that allows smooth transitions around the zero current level. Low-noise and high-stability are the main characteristics of this bipolar modules in order to obtain maximum performances on the generated magnetic field in accelerator facilities.

Input ratings of the power supply unit is three-phase 180-220VAC@50-60Hz, adaptable to either the Japanese or US mains distribution networks. European version is available upon request.

Output current and output voltage values are displayed on a display placed on the module front panel; LEDs are also indicators of the module operational status. Remote connectivity to LIAM 6005, as for all other CAENels instrumentation, is guaranteed by means of a standard

RJ-45 Ethernet connection that allows easily controlling and monitoring of the functionalities for the power supply – e.g. current setting, output current and voltage reading, temperature monitoring, etc.

The “digital” communication approach gives the advantages of greatly improved noise immunity: the analog voltage control signals that are usually fed from an external DAC are subject to noise pick-up and this effect is greatly amplified when needing very precise output currents or voltages.

Accuracy of the output current is also a great advantage of using digital interface: the calibration of the output current is performed, using a 3rd order polynomial fit curve, directly on the module itself so that external DAC drifts or non-linearity are avoided/bypassed.

Control of the output current is made by LIAM internal transformers are optimized to reduce magnetic flux leakage that could cause EMI (Electro-Magnetic Interference).

About CAENels

CAENels is a dynamic company that provides power supplies and state-of-the-art dedicated electronic systems to the particle accelerator community - e.g. synchrotron light sources and Free Electron Laser (FEL) facilities.

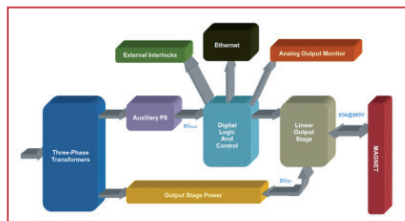
- Magnet Power Supply Systems
- Beamline Electronic Instrumentation
- Precision Current Transducers
- High-Voltage Dedicated Systems

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LIAM 6005 – Block Diagram

A high-resolution and low-drift Digital-to-Analog Converter (DAC) that sets a resolution of 165 μA on the module output current setpoint.

External configurable interlocks are also provided on the LIAM 6005 rear panel in order to have the power supply connected to some external devices or safety circuits.

A status output is also available on the rear panel of the device: it allows the monitoring of the module output stage

(enabled/disabled) by opening/closing a contact.

A load energy protection/damping circuit is implemented in order to protect the power supply and the load from over-voltage conditions.

A monitor output – rated at $\pm 10\text{V}$ for a $\pm 5\text{A}$ output current- is also present on the rear panel of the power supply on a BNC connector.

Technical Specifications

Rated Output Current	$\pm 5\text{ A}$
Rated Output Voltage	$\pm 60\text{ V}$
Rated Output Power	300 W
Input Voltage	$3 \times 180\text{--}220\text{ V(AC)}$ @ 47-63 Hz
Output Topology	Zero-crossing Linear Amplifier
Maximum Inductive Load	100 mH (more upon request)
Current Setting Resolution	160 μA
Accuracy	< 0.01 %
Output RMS Ripple (0-100 kHz)	0.2 mA
Long Term Stability (8h)	0.25 mA
Output Monitor Gain	2 V/A
External Interlocks/States	2 Inputs: configurable 1 Output: indicates if module is ON/OFF
Internal Interlocks	Over-Temperature Regulation Fault AC Phase Fail
Hardware Protections	Load energy dumping (crowbar) Circuit breakers Internal Temperature
Auxiliary ADC Read-Backs	Output Current Output Voltage Setting Register Dc-Link Voltages Internal Temperatures
Cooling	Forced Air Convection
Connection	Ethernet TCP-IP / UDP
Extra-Features	Firmware Update
Local Display	2.5" display
Mechanical Dimensions	19" $\times$ 2U $\times$ 550 mm crate

Ordering options

WLIAM6005XAA	LIAM 6005	LIAM 6005 Low-Noise High-Stability Bipolar Linear Power Supply ($\pm 5\text{A} @ \pm 60\text{V}$)
WDISTLIAMXAA	LIAM DIST	19" - 6U Distribution Crate (up to 16 LIAM units)