

10 kV Isolation Amplifier

Intruduction

The 10 kV Isolation Amplifier is a high-safety analog signal isolation device designed for nuclear fusion plasma experiments and high-voltage, high-electromagnetic-interference environments. The unit provides electrical isolation withstanding up to 10 kV DC, enabling safe and stable signal transmission under high common-mode voltage conditions. The system employs a custom-designed isolation transformer combined with a multi-stage analog signal processing architecture, achieving exceptional isolation performance without compromising signal accuracy or stability. Housed in a compact chassis with standardized connectors, the instrument is well suited for plasma diagnostics, high-voltage power supply testing, and high-energy physics measurement systems.



Parameters

Parameter	Specification
Number of Channels	1 (Single-channel)
Input Signal Type	Analog voltage
Output Signal Type	Analog voltage
Input Voltage Range	± 2 V
Output Voltage Range	± 2 V
Gain	1
Signal Polarity	Non-inverting
Isolation Voltage	≥ 10 kV DC (1 min)
Bandwidth	200 kHz
Gain Error	$\leq 1\%$
Nonlinearity	$\leq 0.5\%$
Output Noise	≤ 20 mVpp
Input Impedance	1 M Ω
Supply Voltage	12 - 24VDC
Power Consumption	≤ 1 W
Connectors	BNC (signal); DC power jack (power)
Dimensions	15 cm*16 cm*8 cm

Application

This product is designed for high-voltage and high electromagnetic interference environments, enabling precise analog signal measurement and reliable isolation protection. It is widely used in experimental diagnostic systems for large scientific facilities such as nuclear fusion and high-energy physics, as well as industrial testing applications including high-voltage power supplies and power electronics systems. Specific use cases include:

1. Plasma gun and plasma source development
2. Compact torus injection system development
3. Radio-frequency heating system development