



RITEC Ltd.

**MINIATURE PREAMPLIFIER
Model PA101C**

The RITEC Model PA101C is a miniature, low noise, charge-sensitive preamplifier for gamma spectroscopy with room-temperature-operated semiconductor detectors (CdTe, CdZnTe, HgI₂).

The preamp converts the charge carriers developed in the detector during each absorbed nuclear event to a step function voltage pulse, the amplitude of which is proportional to the total charge accumulated in that event.

PERFORMANCE

- **NOISE** ≤ 2.0 keV, based on CdTe equivalent at 1 μs with input capacitance 0 pF, at operation temperature +22 °C
 ≤ 3.0 keV, based on CdTe equivalent at 1 μs with input capacitance 50 pF, at operation temperature +22 °C
- **RISETIME** ≤ 100 ns at 0 pF
 ≤ 200 ns at 50 pF
- **CHARGE SENSITIVITY** ≥ 200 mV / MeV at CdTe
- **INTEGRAL NONLINEARITY** ≤ 0.1%
- **GAIN STABILITY** ≤ 0.01 % / °C over range of 0 °C to +50 °C
- **DETECTOR BIAS ISOLATION** ≥ 1500 V (tested at 2000 V)

INPUT

DETECTOR INPUT accepts positive or negative charge pulses from semiconductor detector.

OUTPUT — INPUT

Accepts the bias voltage for the semiconductor detector from a bias supply.

Provides unipolar (positive or negative) voltage linearly proportional in peak amplitude to the charge input, inverting. Output swing range is ± 3 V open circuit. Output impedance is 50 Ω.

CONNECTORS

- **INPUT**.....type BNC
- **OUTPUT - INPUT** LEMO FGG.2B.704 type (male)

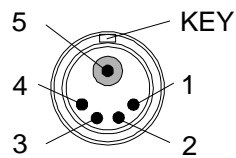
ELECTRICAL AND MECHANICAL

- **POWER REQUIREMENT** +12 V, ≤18 mA
 -12 V, ≤ 12 mA
- **DIMENSIONS**..... diameter - 23 mm
 length - 73 mm

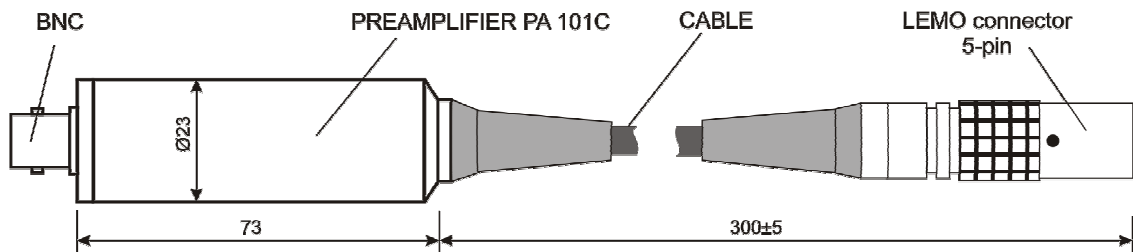
Output - Input Connector PIN Assignment

Pin	Circuit
1	GND
2	+12 V
3	- 12 V
4	OUTPUT
5	HV

View of the Connector LEMO FGG.2B.704 type (male) from the FRONT Side



Design feature of the preamplifier Model 101C type



Simplified Schematic of the AC-Coupled preamplifier

