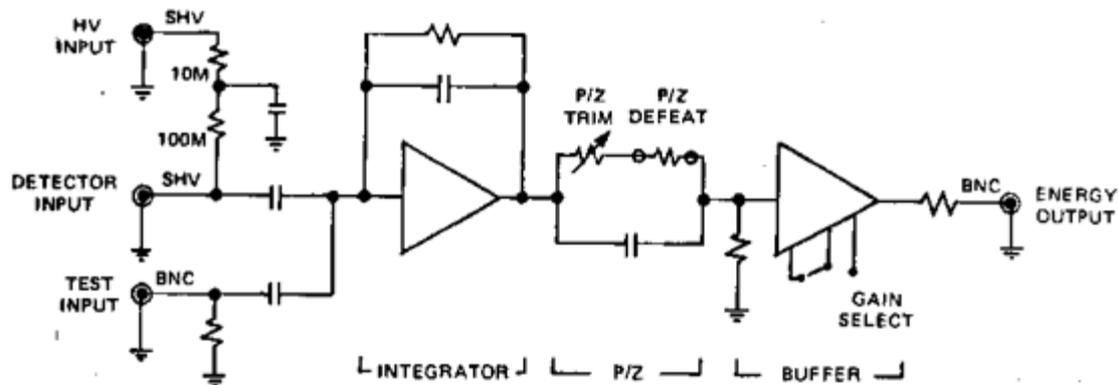


Preamplifier Model 3002

Description

The IAP Model 3002 represents the latest advance in charge sensitive preamplifiers designed for use with room temperature semiconductor detectors, particularly the silicon surface barrier type. The preamplifier converts the ionization charge developed in the detector during each absorbed nuclear event to a step function pulse output whose amplitude is proportional to the total charge accumulated in that event. The pulse decays exponentially with a time constant of 50 microseconds (nominal) to segregate successive events in high count rate applications.

As can be seen in the following schematic, the first stage functions as operational integrator yielding an output voltage proportional to the accumulated charge. The second stage functions as a selectable gain differentiator/buffer. The higher scale factor is especially useful for best signal-to-noise ratio in experiments involving low energy source. The differentiator circuit includes pole/zero adjustment to return the unipolar pulse signal to a reference baseline level without overshoot.



1. Specification

1.1 Inputs

- Detector Input: Accepts positive or negative charge pulses from semiconductor detectors
- Test input: Accepts a positive or negative signal
- Input impedance: 93 Ω
- Gain: 2.5 V/V or 5 V/V
- HV Input: ± 5000 Vdc

1.2. Outputs

- Inverting, pulse end.
- Decay time: 50 μ sec ($\pm 10\%$)
- Output impedance: 93 ohms
- Offset: ± 50 mVdc (at gain of 9mV/MeV) or 0 ± 150 mVdc (at gain of 45 mV/MeV).

1.3. Performance

- Integral Nonlinearity: Less than $\pm 0.02\%$
- Charge Sensitivity: 0.2 V/picocoulomb or 1.0 V/picocoulomb, corresponding to 9 mV/MeV or 45 mV/MeV equivalent.
- Power Requirement
 - +12VDC-2mA
 - 12VDC-2mA
 - +24VDC-30mA
 - 24VDC-15mA

2. Factory Repair

This device, or any other standard IAP product, may be returned to the factory for repair service at a nominal cost. Our standard procedure for repair ensures the same quality control and checkout that are used for a new instrument. Always contact consumer service at IAP, (021) 22779028, before sending in an instrument for repair to obtain shipping instructions and so that required return authorization number can be assigned to the unit. Write this number on the address label and on the package to ensure prompt attention when it reaches the factory.