

Judson Technologies

and its associated products

PA-9 PREAMPLIFIERS

FB 216

November 2000

Operating Instructions

Description:

The PA-9 preamplifier is ideal for high-impedance photodiodes such as cryogenically cooled InSb, Ge and InAs. It offers superior high-frequency performance, with low current noise and ultra-low voltage noise. When ordered with a detector, the preamp is matched for maximum gain and sensitivity. Alternatively, the customer may specify gain and/or minimum required bandwidth. Bandwidth is a function of detector resistance and capacitance as well as preamp gain, as shown on the reverse side of this bulletin.

Gain Stages:

The PA-9 has a first stage transimpedance gain and a second stage voltage gain. Output from both stages are accessible to the user.

Normal gain for the first stage is 10^7 , 10^6 , or 10^5 V/A. For lowest noise, choose the highest gain possible to achieve the desired bandwidth.

The second stage is set for a 10 V/V gain. Choosing 10 V/V results in lower bandwidth for the second stage. The second stage is normally AC coupled but can be DC coupled per customer specifications.

Connections:

Input and output connections are BNC feed-throughs. The power jack is a 5-pin male Lemo connector; the mating female Lemo connector is included with the preamp.

Specifications:

- Bandwidth (maximum)¹.....DC to 750 KHz
- First Stage Gain..... 10^7 , 10^6 or 10^5 V/A
- Voltage Noise Density @1 KHz..... 6.5 nV Hz^{-1/2}
- Current Noise Density @1 KHz.....0.04 pA Hz^{-1/2}
- Input Offset Voltage..... ± 2 mV
- Input Bias Current..... ± 1 pA
- Maximum Output (First Stage).....6 VP-P
(Second Stage).....10 VP-P

Power Requirements..... ± 12 VDC or ± 15 VDC, 20 mA

Size.....3" x 4.5" x 1"

¹ Using a 100K Ω feedback resistor

Cautions:

Do not turn on the preamp power supply unless the detector is connected.

Assure that the power supply is +12V to ground and -12V to ground (NOT ± 24 V).

Observe correct power supply polarity (see drawing on the reverse side of this bulletin). Improper polarity will damage the preamplifier.

Preamplifier/Detector Matching Information for PA-9-70

Preamplifier Serial # 02-01-9812

Matched to:

Detector Model# J16D-M205-RO1M-60

Detector Serial # 02-01-30429

Detector Impedance R_D 200G Ω

Detector Capacitance C_D 127.5 pF

First Stage

Gain: 1 x 10E 7 V/A

Bandwidth: DC to 16 kHz

Second Stage

Gain: 10 V/V

Bandwidth: 15 Hz to 16 kHz

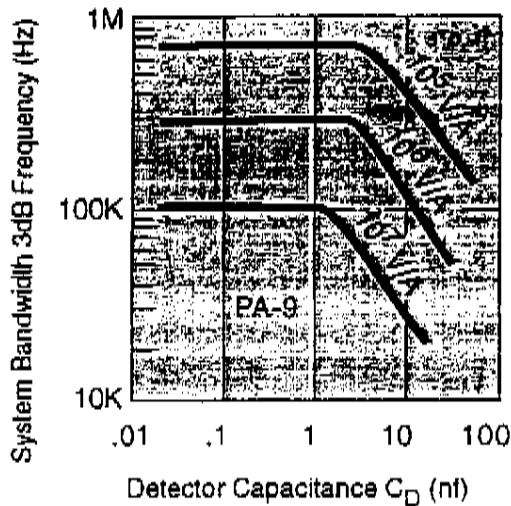
Tested by: E. Lyano Date: 01-17-02

Approved by: [Signature] Date: 1-17-02

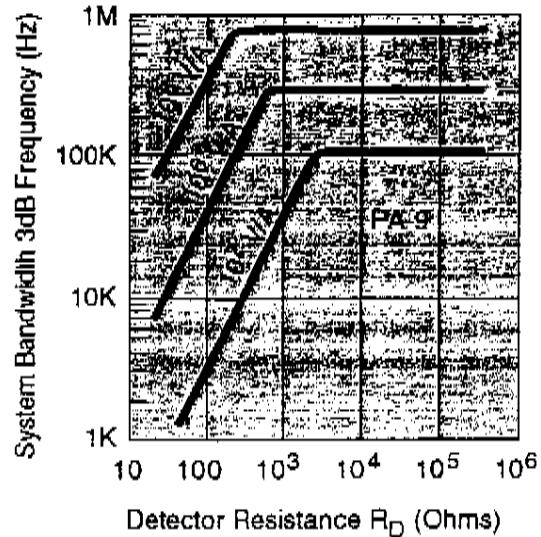
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PA-9 Bandwidth vs Detector Capacitance

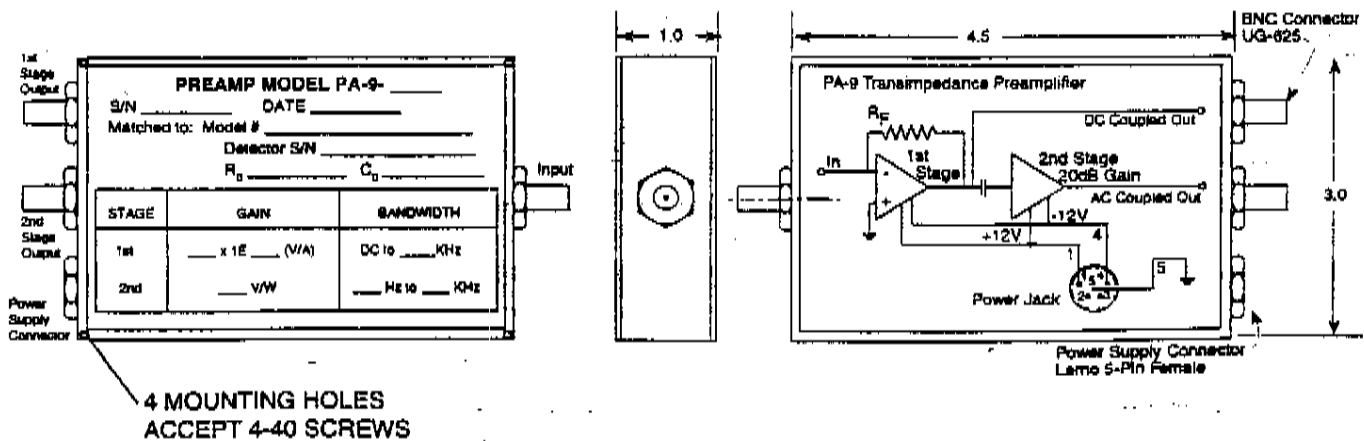


PA-9 Bandwidth vs Detector Resistance



PIN	DESIGNATION
1	+12V or +15V
2	NC
3	NC
4	-12V or -15V
5	GROUND

NOTE: CONFIGURATION APPLICABLE TO PREAMP S/N 6019 AND ONWARD.



Information in this document is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omission. Specifications are subject to change without notice.

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