PA-5, PA-6 and PA-7 PREAMPLIFIERS

Operating Instructions

PB 216

April 2002

Judson transimpedance preamplifiers are designed to get the best performance from Judson Germanium, Indium Arsenide and Indium Antimonide detectors. Each amplifier has switch-selected variable gain as shown in the table below. Bandwidth depends on detector resistance and capacitance as shown on the attached graphs.

CONNECTIONS:
Input and output connectors are BNC feedthroughs. Power supply and ground connections are made through Lemo connector as shown on the reverse side of this sheet.

CAUTIONS:

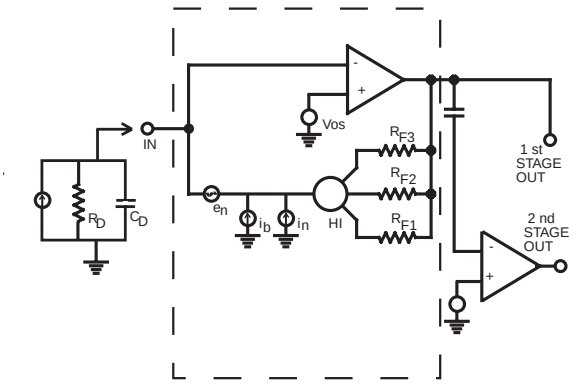
CONNECT DETECTOR BEFORE TURNING ON POWER SUPPLY. CORRECT POWER SUPPLY POLARITY MUST BE OBSERVED. REVERSAL MAY DAMAGE PREAMPLIFIER.

Typical Specifications Model PA-5, PA-6 and PA-7 Current Mode Preamplifiers @ 25°C

Model		PA-7 Series			PA-6 Series		PA-5	Units
		PA-7-70	PA-7-60	PA-7-50	PA-6-60	PA-6-50	PA-5-50	
Transimpedance	High	10^7	10^6	10^5	10^6	10^5	10^5	
Gain:	Med	10^6	10^5	$2.5x10^4$	10^5	$2.5x10^4$	10^4	V/A
(Switch Selected)	Low	10^5	$2.5x10^4$	10^4	$2.5x10^4$	10^4	10^3	
Bandwidth	@ High Gain	8	60	150	60	150	200	
R_D>10KΩ,C_D<0.2nF	@ Med Gain	60	150	200	150	200	200	KHz
(See Figs. 53-2, 53-3)	@ Low Gain	150	200	200	200	200	200	
Input Offset Voltage (V_{os})		±250	±250	±250	±100	±100	±80	µV
Input Bias Current (i_b)		±0.001	±0.001	±0.001	±12	±12	±30	nA
Voltage Noise Density (e_n)@1KHz		12	12	12	4.5	4.5	1.1	nV $Hz^{-1/2}$
Voltage Noise from 0.1 to 10Hz		1.5	1.5	1.5	.080	.080	.035	µVpp
Current Noise Density (i_n)@1KHz†		.04	.13	.04	.5	.64	1	pA $Hz^{-1/2}$
Output Impedance		< 100						Ω
Maximum Output Voltage		± 10						Vpp
Power Requirements		+12V and -12VDC @ 10mA or +15V and -15VDC @ 10mA						
Recommended for Detector Series:		J16, J16TE1, J16TE2, J16D, J10D			J16, J12TE2, J12TE3		J12 J12TE2	

† At High Gain Setting

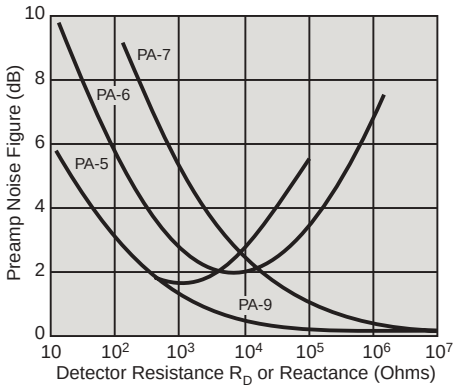
Equivalent Circuit for Transimpedance Preamplifiers



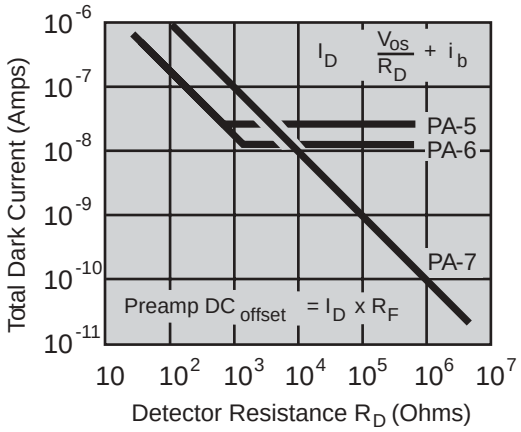
e_n: Voltage Noise Density
i_n: Current Noise Density
V_{os}: Input Offset Voltage
i_b: Input Bias Current
R_D: Detector Resistance
C_D: Detector Junction Capacitance

PA-5, PA-6 and PA-7
PREAMPLIFIERS
Operating Instructions

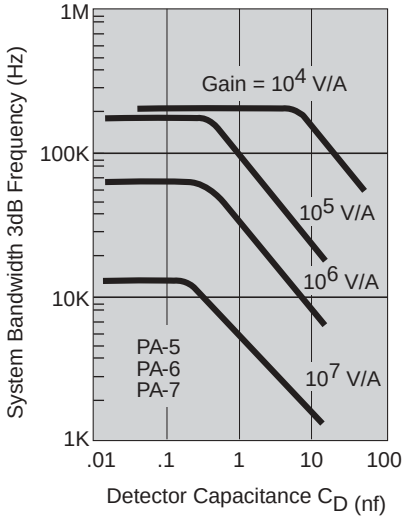
Preamplifier Noise Figure vs Detector Resistance



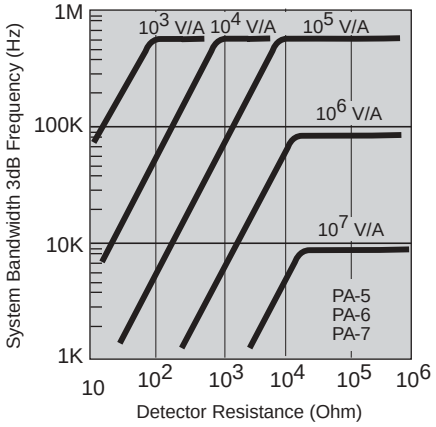
DC Offset Output Voltage vs Source Resistance

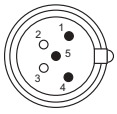


System Bandwidth vs Detector Capacitance

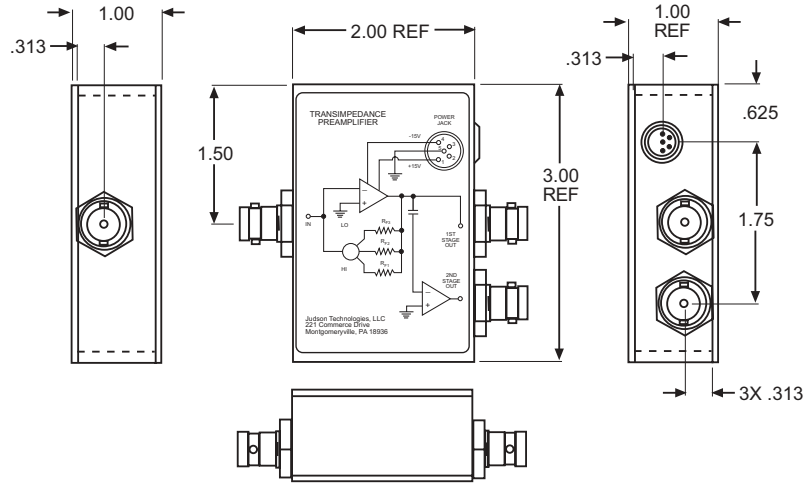


System Bandwidth vs Detector Resistance





PIN #	DESCRIPTION
1	+12V or +15V
2	N/C
3	N/C
4	-12V or -15V
5	GND



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.

Judson Technologies, LLC

221 COMMERCE DRIVE
MONTGOMERYVILLE, PA 18936-9641
PHONE: 215-368-6901, FAX: 215-362-6107
www.judtech.com