

100 SERIES HIGH IMPEDANCE VOLTAGE PREAMPLIFIERS

DL Instruments, LLC

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These low noise, FET input preamplifiers typically are used with piezoelectric transducers such as accelerometers, hydrophones and seismometers. They also provide excellent performance with high impedance bolometer type transducers and with pyroelectric photo-detectors. Their rugged design allows operation in severe environments such as encountered in underwater acoustics applications. 100 Series Preamplifiers are designed particularly as "front ends" for 4000 Series Electronic Filters and 450 Series Instrumentation Amplifiers. They may also be used as gain blocks ahead of lock-in amplifiers and other instrumentation such as oscilloscopes, spectrum analyzers and analog-to-digital converters.

The L package configuration incorporates the same connector type used with 1600 Series Preamplifiers. The cables listed next to Figure 23 can be used to power 125L, 143L and 144L Preamps from DL Instruments filters and instrumentation amplifiers; and the cables will as well carry the preamplified signal back to the filters and instrumentation amplifiers. If no cable is specified then Mating Connector Model 100AE will be supplied for wiring to an external dc supply. This connector must be used with DL Instruments lock-ins and other instrumentation in order to provide an output connection from the preamplifier via user supplied wiring. The 100 Series

Preamplifiers do not incorporate internal regulators, and must be operated either from regulated dc power supplies or batteries. The dc power inputs are protected against reverse polarity connection.

SPECIAL PURPOSE PREAMPLIFIERS

DL Instruments can provide low noise preamplifiers similar to those described with features such as remotely switchable gain, precisely controlled low frequency rolloff, line drive capability, 1 MHz bandwidth or differential input. Consult factory for specifications. Custom and OEM modifications are available.

100 SERIES COMMON SPECIFICATIONS

INPUT IMPEDANCE 1000M Ω //15pF
TYPICAL SOURCE R_s <100 M Ω C_s > 50 pF
GAIN STABILITY \pm 0.1 dB
OUTPUT POLARITY Non-inverted
MAXIMUM SAFE INPUT (ac + dc) \pm 75 V
TEMPERATURE operating -25°C to +55°C
storage -55°C to +85°C
PACKAGE Hermetically sealed
SHIELDING Electrostatic
HYDROSTATIC PRESSURE Available rated to 1500 psi

MODEL (Letters designate package type)	125L		143E	144E	143L, 143N	144L, 144N
DESCRIPTION	Low Power		Low Power		Medium Power, Improved Output Capability	
GAIN	0 \pm 0.1 dB		20 \pm 0.2 dB	40 \pm 0.2 dB	20 \pm 0.2 dB	40 \pm 0.2 dB
FREQUENCY RESPONSE (-1 dB)	0.1 Hz to 200 kHz		0.5 Hz to 200 kHz		0.5 Hz to 200 kHz	
NOISE* (Shorted Input) (100 pF Source)	8 μ V rms (-102 dBV) 10 μ V rms (-100 dBV)		2.4 μ V rms (-112 dBV) 8 μ V rms (-102 dBV)		2.4 μ V rms (-112 dBV) 8 μ V rms (-102 dBV)	
DYNAMIC OUTPUT IMPEDANCE	100 Ω in Series with 100 μ F		50 Ω Direct Coupled		35 Ω in Series with 40 μ F	
PARAMETER VARIATION WITH SUPPLY VOLTAGE (Typical)	+12 V to +25 V(max)		+12 V to +25 V(max)		+15 V to +30 (max)	
Supply Current (Quiescent)	2.5 mA	5 mA	4 mA	9 mA	10 mA	20 mA
Maximum Output, V p-p	7 V	12 V	8 V	18 V	9 V	18 V
I p	1.0 mA	2.0 mA	0.75 mA**	1.5 mA**	4 mA	10 mA
DC Voltage at Output	0	0	+6 V	+14 V	0	0
Distortion (1 V rms into 5 k Ω)	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%
Power Supply Isolation, RTI	35 dB	55 dB	65 dB		65 dB	
CALIBRATION SYSTEM	Non Standard		Non Standard		Standard in N Package	
WEIGHT (Nominal)	75 Grams 2.65 oz.		50 Grams 1.75 oz.		L Pkg 75 Grams 2.65 oz N Pkg 65 Grams 2.30 oz	

* 200 kHz Bandwidth, 25°C, Referred to Input

** Maximum output current may be increased by connecting a resistor as low as 1 K Ω from preamplifier output directly to ground

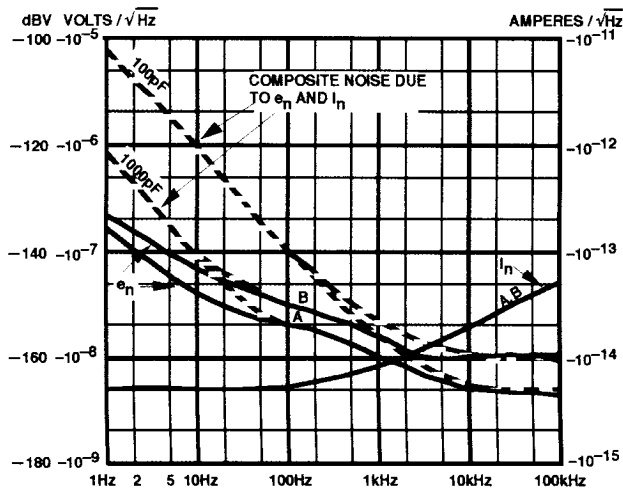


Figure 2 Noise Voltage and Noise Current For High Impedance Voltage Preamplifiers, 1 Hz BW

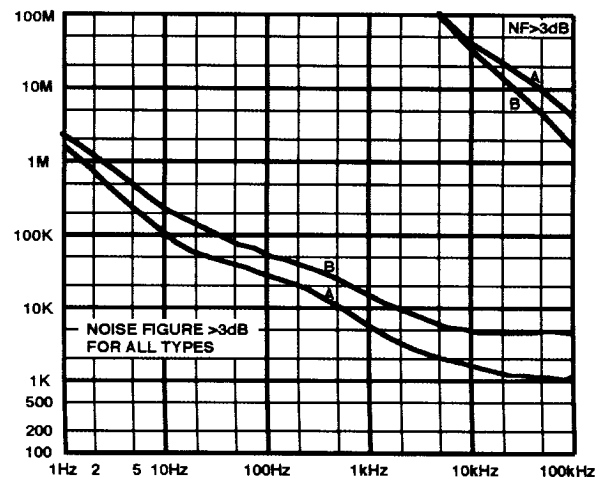


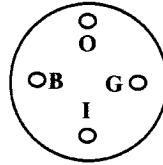
Figure 3 3 dB Noise Figure Contours for High Impedance Voltage Preamplifiers

E PACKAGE

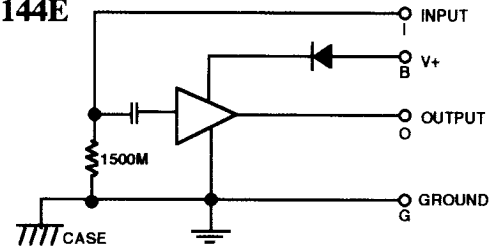
CAN SIZE
29 mm dia, 41 mm long
(1.13" Dia., 1.6" long)

PIN CONNECTIONS

- O OUTPUT
- B POWER
- I INPUT
- G GROUND

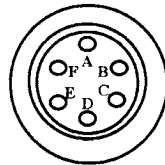


143/144E



L PACKAGE

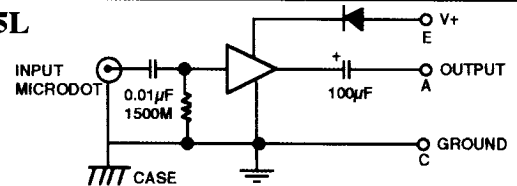
CAN SIZE
29 mm dia, 59 mm long
(1.13" Dia., 2.3" long)



PIN CONNECTIONS

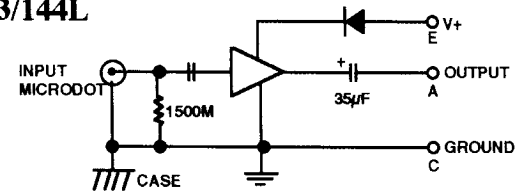
- A OUTPUT
- C GROUND
- E POWER

125L



SEE NOTE

143/144L

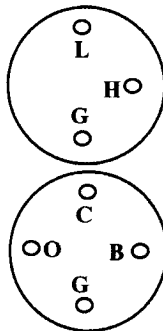


N PACKAGE

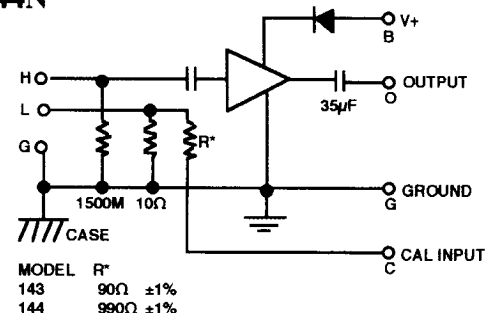
CAN SIZE
29 mm dia, 59 mm long
(1.13" Dia., 2.3" long)

PIN CONNECTIONS

- G GROUND
- H INPUT HI
- L INPUT LO
- C CALIBRATE
- O OUTPUT
- G GROUND
- B POWER



143/144N



Note: The miniature coaxial connector on package L is Microdot 051-0049. DL Instruments will supply the mating connector attached to a length of low noise cable as P/N 100AAM3.

For more information contact