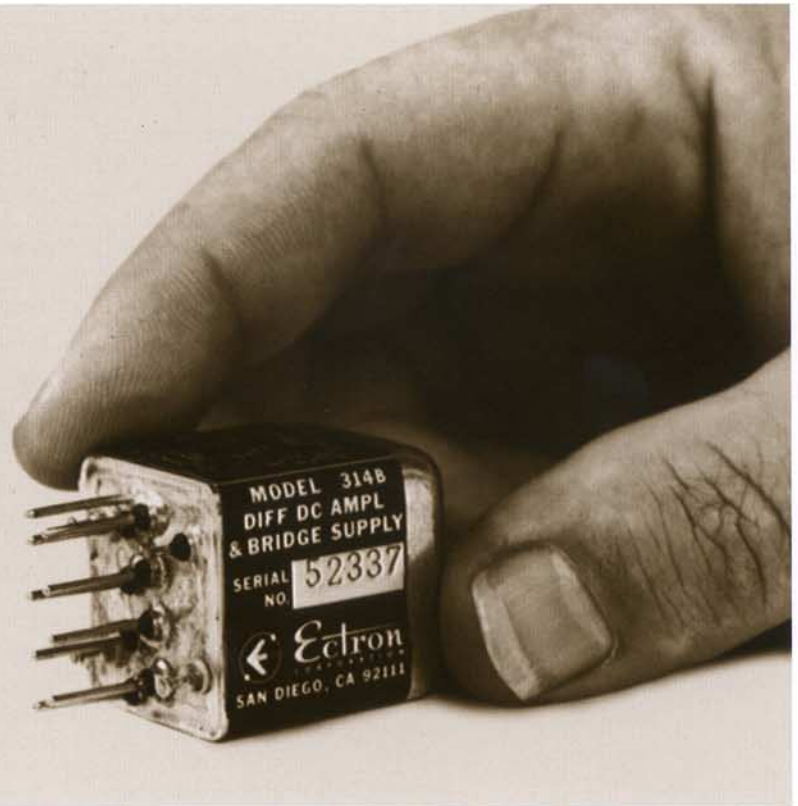




MODEL 314B

SEVERE ENVIRONMENT
SUBMINIATURE AMPLIFIER

- Less than 1.2 cubic inch volume
- 2500G shock
- -25°C to +71°C operation
- EMI protected
- Integral bridge excitation
- Gain variable to 1000
- Transformer isolated
- Adjustable output offset



DESCRIPTION

The Ectron Model 314B is an Extreme Environment, Subminiature, Differential DC Amplifier with a built-in, isolated bridge excitation supply. It is designed for use with a wide variety of external transducers including strain gages. Occupying less than 1.2 cubic inch (18.4cm³) of space and weighing less than 1.7 ounces (48 grams), it is ideally suited for applications where space is at a premium and the minimum possible weight is required. The dense packaging, encapsulated construction and advanced design result in a finished product which can produce highly accurate data under the most severe shock and vibration conditions. In addition, the use of special components and a sealed case permit it to operate over the severe temperature range of -25°C to +71°C and in environments of up to 100% relative humidity. Protection against electromagnetic interference (EMI) is obtained through the use of a steel case and filters in all input, output, excitation and power leads.

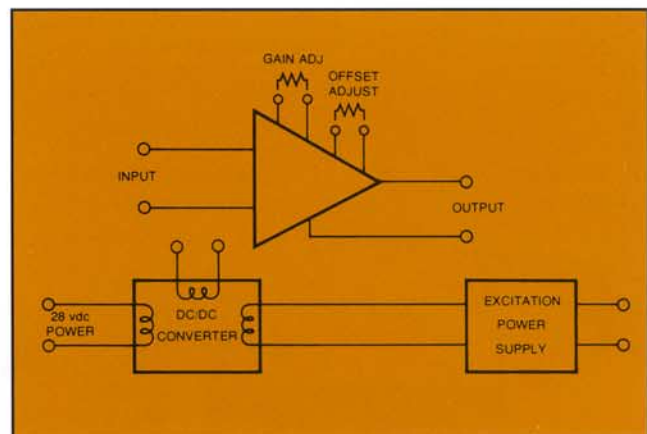
APPLICATIONS

The Model 314B is particularly adapted to airborne applications involving severe vibration conditions and temperature extremes. Because of its unusual ballistic properties it is exceptionally well-suited to on-board testing of rockets, missiles and projectiles. Its ability to operate under extreme conditions of acceleration make it ideal for measurements during explosions, in crash and impact tests or on rocket test sleds. Other areas of application include jet aircraft, helicopters, meteorological balloons, shipborne instrumentation, un-

attended buoys, automobile and truck testing, large turbines and power generating equipment, submarine installations, railroad car and locomotive tests, forge and press instrumentation, remote test stations in hostile environments, deep shaft measurements, arctic tests, etc.

SPECIAL MODIFICATIONS

Although the small size and dense packaging prohibit large scale modifications, custom versions of the Model 314B involving variations in specifications are possible. Please consult the factory for further information.



MODEL 314B

SEVERE ENVIRONMENT SUBMINIATURE AMPLIFIER



SPECIFICATIONS

AMPLIFIER

| | |
|----------------------------|--|
| Input Impedance: | 10 megohms min., shunted with 0.0015 μ F. nominal |
| Input Offset Voltage: | < \pm 0.2mV |
| Input Offset Current: | < \pm 200nA |
| Common Mode Rejection: | 40dB min. plus gain in dB, from dc to 100Hz with balanced 350 Ω source. |
| Common Mode Voltage: | \pm 5Vdc or peak ac. |
| Gain: | 10 to 1000 determined by external gain resistor, customer supplied. |
| Gain Accuracy: | < \pm 0.5% independent of customer supplied gain determining resistor. |
| Frequency Response: | dc to 4kHz \pm 2%, 4kHz to 20 kHz within +1 -3dB. |
| Linearity: | \pm 0.05% |
| Noise (p-p): | 45 μ V RTI, +15mV RTO, dc to 30kHz. |
| Output Impedance: | <1 Ω at dc. |
| Output Offset Control: | The output may be set from 0 to + 4 volts by adding an external resistor. |
| Temperature Coefficient: | Over a range of -25 $^{\circ}$ to +71 $^{\circ}$ C zero shift will be < \pm 2.2 μ V/ $^{\circ}$ C RTI, \pm 140 μ V/ $^{\circ}$ C RTO, at any gain. Gain shift \pm <0.005%/ $^{\circ}$ C. |
| Stability: | \pm 20mV RTI for 200 hours. (30 minute warm-up) |
| Output Capability: | 0 to \pm 5V at up to 5mA. Short circuit protected. |
| Supply Voltage Dependency: | Variations in output will not exceed \pm 10mV for variations of \pm 4 volts in power. |
| Isolation: | The amplifier is transformer isolated from power source and from bridge excitation supply. |

MECHANICAL

| | |
|-----------|--|
| Size: | Less than 1.125 cubic inches (18.4cm ³) exclusive of solder terminals. See drawing. |
| Weight: | 1.7 ounces (48 grams). |
| Mounting: | Clamp to suitable surface. May be stacked with proper heat sinking (Max. case temperature 86 $^{\circ}$ C). Optional flange mounting available. See drawing for PCB mounting. Pins mate with D Series connector. |

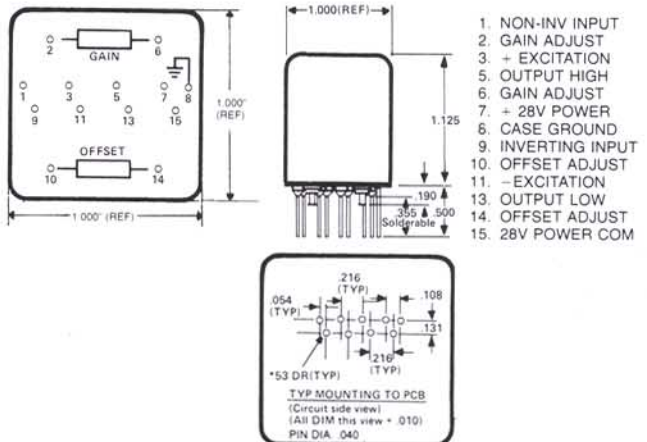
RTI means: referred to input—RTO means: referred to output
Specifications subject to change without notice.

BRIDGE EXCITATION SUPPLY

| | |
|-------------------------------|---|
| Output Voltage: | 5 \pm 0.1 Vdc., 0.1% Line, 0.1% Load Regulation |
| Current: | 15mA (350 Ω load) max. Short circuit protected. |
| Drift (Constant Temperature): | \pm 3mV max. for 8 hours. (30 minute warm-up) |
| Temperature Coefficient: | 0.01%/ $^{\circ}$ C max. from -25 $^{\circ}$ to +71 $^{\circ}$ C. |
| Isolation: | Transformer isolated from amplifier and power. |

ENVIRONMENT

| | |
|-------------------------------|---|
| Temperature: | All specifications apply, -25 $^{\circ}$ to +71 $^{\circ}$ C after 30 minute warm-up) (Temperature range to +93 $^{\circ}$ C on special order.) |
| Vibration: | Output noise will not exceed 75mVp-p for 35g peak vibration 30 to 2000Hz. |
| Shock: | Output noise will not exceed 100mVp-p for shock of 2500g, 0.5 milliseconds each axis. |
| Altitude: | Unlimited with suitable heat sink. |
| Humidity: | 100% RH. |
| Electromagnetic Interference: | All input, output, excitation and power leads are decoupled using EMI filters. |
| POWER SUPPLY | |
| Power: | 28V \pm 4V, 50mA max. (including bridge supply load). Reverse polarity protected. |
| Transients: | Overvoltage transients up to 50 volts for up to 100 milliseconds will not damage unit. |
| Reflected Noise: | Less than 3mVp-p with 0.7 Ω source. |



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ORDERING INFORMATION

For price and delivery information, please contact the factory or the Ectron representative in your area.