Charge Amplifier

Dual Mode Charge Amplifier with Piezotron® Operating Mode

Versatile, simple to use multi-range, line powered amplifier that converts Kistler sensor signals into proportionally controlled voltage. The dual mode allows for signals from either charge (high impedance) or low impedance (voltage mode) types to be processed.

- High and low impedance sensors
- Dynamic and quasistatic measurements
- Automatic zero adjustments
- RS-232C interface
- Ultra high accuracy and low noise
- Ground isolates I/O connectors

Description

Type 5010B… is a versatile, line-powered, dual mode amplifier for use with high impedance (charge mode) or low impedance (voltage mode) sensors. In the charge mode, the unit converts the input charge signal into a voltage proportional to the measurand. The voltage mode provides sensor source current for powering low impedance sensors.

The dual mode charge amplifier can be used to measure dynamic pressure, force, strain and acceleration from piezoelectric sensors. A long time constant mode permits the user to measure short duration static (quasi-static) events. The scale and sensitivity settings are designed to provide a direct readout in volts per mechanical unit eliminating mathematical manipulations. A rear panel receptacle is provided for remote control of the Reset and Operate modes.

A micro-controller controls all Type 5010B… functions and constantly monitors the unit’s condition. Additionally, it continuously checks for input overload and condition of low impedance sensors. LEDs provide operational status while the LCD provides an indication of error overload, sensitivity, scale, time constant, bias and baud rate when RS-232C is activated.

Each unit is extensively tested using an automatic test and calibration system to ensure the highest possible accuracy and quality. A detailed NIST traceable calibration certificate is furnished with each unit.

Application

The primary use for Type 5010B… charge amplifier is to convert the charge signal from a high impedance piezoelectric force, pressure or acceleration type sensor into a high level output voltage and provide excitation power along with signal processing for voltage mode type sensors. When Type 5010B… is used with a voltage mode sensor, the signal polarity as it passes through the amplifier becomes inverted. The dual mode charge amplifier is considered a laboratory type instrument and should be well protected if used in an industrial environment.

Technical Data

<table>
<thead>
<tr>
<th>Specification</th>
<th>Unit</th>
<th>Type 5010B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement range</td>
<td>pC</td>
<td>±10 ... 999000</td>
</tr>
<tr>
<td>Scale settings 1,2,3,4,5 sequence</td>
<td>MU/V(μ)</td>
<td>0.0002 ... 1000000</td>
</tr>
<tr>
<td>Sensor sensitivity</td>
<td>pC/MU</td>
<td>0.01 ... 9999</td>
</tr>
<tr>
<td></td>
<td>mV/MU</td>
<td>0.01 ... 9999</td>
</tr>
<tr>
<td>Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connector charge, voltage</td>
<td>BNC neg., ground isolated</td>
<td></td>
</tr>
<tr>
<td>Impedance charge mode</td>
<td>Ω</td>
<td>70</td>
</tr>
<tr>
<td>Impedance voltage mode</td>
<td>Ω</td>
<td>100k parallel with 1 nF</td>
</tr>
<tr>
<td>Voltage max.</td>
<td>V</td>
<td>50</td>
</tr>
<tr>
<td>Insulation resistance at input</td>
<td>Ω</td>
<td>10^14</td>
</tr>
<tr>
<td>Sensor power voltage mode</td>
<td>mA</td>
<td>4 (2 ... 18 optional)</td>
</tr>
</tbody>
</table>
### Ordering Key

**Variant**
- Single channel with RS-232C interface 010B0
- Single channel with case and RS-232C interface 010B1
- Three channel with case and RS-232C interface, charge only 5814

**Accessories Included**
- Power cord 1508
- Remote reset connector 1564
- Plug-in filter, 180 kHz 5311

**Optional Accessories**
- 5 m remote control cable 1455A5
- Remote control box 5663
- Rack adaptor for 6 each 5010B… 5730

Plug-In low pass filters; see filter options below

**Filter Options-Bandwidth Limiting**
- 1, 1.5, 2.2, 3.3, 4.7, 6.8, 10, 15, 22, 33, 47 kHz 5311A(x)kHz
- 10, 15, 22, 33, 47, 68, 100, 150, 220, 330, 680 kHz 5313A(x)Hz

Low pass, 12 dB/Octave Roll-off
x = cut-off frequency (-3db)

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### Measure

- **Connector**: 9 pin D-Sub.
- **Baud Rates**: 150 … 9600
- **Maximum cable length**: 65 (2500 pF)

**Remote control connector**

- DIN 45322 6-pol neg.

**Temperature range**

- Operating °F: 32 … 122
- Storage °F: -4 … 158

**Humidity non-condensing**

- %: 10 … 90

**Power line**

- **Voltage**: VAC 89 … 135
- **Frequency**: Hz 48 … 62
- **Power consumption max.**: VA 14

**Weight without case**

- lb: 2.8

**Dimensions without case**

- in: 2.8 x 5.1 x 7.25

1 g = 9.80665 m/s², 1 Inch = 25.4 mm, 1 Gramm = 0.03527 oz, 1 lbf-in = 0.113 Nm

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