**DESCRIPTION**

The Model 4402B is an ultra-pure sinewave, stable amplitude oscillator designed to meet the needs of today's high precision 16 to 18 bit A/D converter testing, and audio test and measurement technology.

Covering the frequency range from 1Hz to 110kHz, with precise 3 digit frequency tuning, the 4402B produces a virtually “distortion-free” (<0.0005%) sinewave for measuring A/D converter accuracy, audio preamplifier and power amplifier harmonic distortion. With its exceptionally flat response (0.02dB), the 4402B eliminates the need to constantly monitor voltage levels, during frequency response testing.

**OUTPUT**

The 4402B provides a 7Vrms sinewave output (balanced output, 14Vrms end-to-end), 3.5Vrms into 50 ohms, and has no loss in performance when loaded with a linear 50 ohm load. A 3-position, push-button attenuator calibrated in 20dB steps, along with a 30dB vernier, provides a total dynamic range of 90dB.

Simultaneous fixed and quadrature (90°) outputs are provided. Each output is 7Vrms with a 600 ohm source impedance.

The 4402B is the perfect addition to your present test and/or precision measurement set-up.

**SPECIFICATIONS**

**FREQUENCY RANGE:** 1Hz to 110kHz.

Accuracy: ±0.5% of frequency setting.

Stability:
- Vs. Time: 0.01% in 1hr or less.
- Vs. Temperature: 0.05%/°C.
- Vs. Line: <0.001% for a 10% change in line voltage.

Control: 2 digits of frequency, calibrated in 1Hz and 0.1Hz steps, with a calibrated vernier providing continuous coverage between the 0.1Hz steps, plus a 5 decade push-button multiplier with overlapping ranges.

**MAIN OUTPUT** (specifications apply to each output to ground)

Maximum Amplitude: 7V rms open circuit; 3.5Vrms (+48dBm) into 50 ohm load.

Impedance: constant 50 ohms.

Maximum Current: 75mA rms.

Minimum Amplitude: <0.2mV.

Amplitude Flatness: ±0.02dB, 1Hz to 110kHz.

Amplitude Stability:
- Vs. Time: 0.01% in 1hr or less.
- Vs. Temperature: 0.05%/°C.
- Vs. Line: <0.001% for a 10% change in line voltage.

Amplitude Control: A 4-position push-button attenuator calibrated in 20dB steps from 0dB to –60dB, accuracy
±0.25dB/20dB step; volts rms control with greater than 30dB of coverage calibrated in volts.

Accuracy: ±20% of setting.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Distortion (%)</th>
<th>Distortion (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Hz to 10kHz</td>
<td>&lt;0.0005</td>
<td>~106</td>
</tr>
<tr>
<td>10kHz to 20kHz</td>
<td>&lt;0.0018</td>
<td>~95</td>
</tr>
<tr>
<td>20kHz to 50kHz</td>
<td>&lt;0.0056</td>
<td>~85</td>
</tr>
<tr>
<td>50kHz to 110kHz</td>
<td>&lt;0.011</td>
<td>~80</td>
</tr>
</tbody>
</table>

Hum and Noise: Greater than 110dB below signal (10Hz to 20kHz detector bandwidth).

**FIXED OUTPUT**

Amplitude: 7V rms open circuit; 3.5V rms (+13dBm) into 600 ohm load.
Impedance: Constant 600 ohms.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Distortion (%)</th>
<th>Distortion (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Hz to 10kHz</td>
<td>&lt;0.0005</td>
<td>~106</td>
</tr>
<tr>
<td>10kHz to 20kHz</td>
<td>&lt;0.0018</td>
<td>~95</td>
</tr>
<tr>
<td>20kHz to 50kHz</td>
<td>&lt;0.0056</td>
<td>~85</td>
</tr>
<tr>
<td>50kHz to 110kHz</td>
<td>&lt;0.011</td>
<td>~80</td>
</tr>
</tbody>
</table>

Phase Accuracy (180° from Main Output): 1Hz to 10kHz, ±0.2°; 10kHz to 110kHz, ±1°.

**QUADRATURE OUTPUT**

Amplitude: 7V rms open circuit; 3.5V rms (+13dBm) into 600 ohm load.
Impedance: Constant 600 ohms.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Distortion (%)</th>
<th>Distortion (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Hz to 10kHz</td>
<td>&lt;0.0031</td>
<td>~90</td>
</tr>
<tr>
<td>10kHz to 20kHz</td>
<td>&lt;0.0056</td>
<td>~85</td>
</tr>
<tr>
<td>20kHz to 50kHz</td>
<td>&lt;0.0174</td>
<td>~75</td>
</tr>
<tr>
<td>50kHz to 110kHz</td>
<td>&lt;0.031</td>
<td>~70</td>
</tr>
</tbody>
</table>

Phase Accuracy (~90°): 1Hz to 1kHz, ±0.2°; 1kHz to 10kHz, ±1°; 10kHz to 110kHz, ±10°.

**GENERAL**

Ambient Temperature Range: 0°C to 50°C.

Power Requirements: Switch selectable, 90-132 or 180-264 volts, single phase, 50-60Hz, 18 watts.

Floating Ground: Rear panel switch floats circuit ground from chassis ground up to 100V.

Dimensions: 3.5” (8.9cm) high, 9” (23cm) wide, 8.5” (21.6cm) deep.

Weights: 5 lbs (2.3kg) net; 7 lbs (3.2kg) shipping.

Accessories: 3-terminal line cord; operating manual.

**OPTIONS**

Rack Mounting Kit: Part No. RK-39 permits the installation of the Model 4402B into a standard 19” rack spacing.

Extended 1 Year Warranty: Part No. EW4402B.

**OPTIONAL ACCESSORIES**

CAB-025: Cable, BNC, 3ft, Low Noise

Specifications are subject to change without notice.