



# Application Note

## Bourns® Model 95 Premium and Model 82 Vintage Guitar Potentiometers



Model 95 Premium



Model 82 Vintage

Electric guitar manufacturing is a multi-billion dollar industry with major manufacturers established worldwide. From the introduction of the first mass-produced electric guitar in 1950, guitarists have been mesmerized with advances in technology and the wide array of after-market parts commercially available for guitar upgrades. Master Luthiers and Master Designers alike have long searched for a better grade of components that would bring years of service to the artist and take performance characteristics to the next level without compromising clarity of tone. This application note addresses the benefits of selecting Bourns® Model 95 Premium and Model 82 Vintage Guitar Potentiometers for design-in and upgrades in electric and bass guitars.

### STANDARD CARBON POTENTIOMETERS

Standard carbon potentiometers have been a staple in the electric guitar industry for many years. All-in-all, guitarists encounter a common dilemma with standard carbon guitar potentiometers that can wear quickly and/or become noisy or “scratchy” in the output with frequent use.

Commercially available potentiometer spray cleaners may temporarily reduce the noise output of a carbon potentiometer. However, the cleaner typically removes lubricant from the element, which can further shorten the rotational life of the potentiometer. Specially-formulated lubricants have been created to minimize noise and to meet the expected rotational life of the potentiometer.

Resistance tolerance plays a major role in the overall tone of an electric guitar. Carbon resistive inks can shift in excess of 15 % with changes in temperature and humidity due to the hygroscopic characteristic of the carbon resistive ink. Although there are commercially available 1 % tolerance carbon potentiometers with a hefty price tag, expectations that the potentiometer will maintain the tolerance in the actual application over an extended period may be unrealistic.

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### POTENTIOMETER DESIGN

Bourns has over 60 years of experience in development of potentiometers and associated proprietary resistive inks that are used in military, aerospace, and medical applications where reliability is key and tolerances are critical. The Sensors and Controls Product Line has now developed a full line of high grade potentiometers customized for use in electric guitars with the same conductive polymer resistive inks.

Materials used in construction of the pot contribute to the stability and performance of the pot. Conductive polymer inks that are used in high grade Bourns® potentiometers are silk-screened onto ceramic elements and fired at much higher temperatures compared to carbon inks that are sprayed on phenolic substrates. The result is a much more stable element and a longer life potentiometer with excellent performance characteristics over temperature and humidity changes seen in the actual application. The multi-finger contact spring design enhances clarity of tone while minimizing extraneous noise. The housing seal protects the internal components from the effects of temperature, humidity *and* dust.

Audio tapers can play a major role in the performance of an electric guitar if the player uses the potentiometer for an effect such as a volume swell. Bourns® Model 95 Premium and Model 82 Vintage Guitar Potentiometers are designed with a specific audio taper to provide a desirable gradual increase in output without “dead spots,” or areas of sudden level increase that may be encountered with lesser grade potentiometers. Together, the element and a multi-finger wiper system produce true sound and tone clarity, providing the guitarist with many years of service.

Bourns® Model 95 Premium and Model 82 Vintage Guitar Potentiometers are available in 250k  $\Omega$  and 500k  $\Omega$  standard resistances with audio taper. They are also available with knurled split-shaft and solid shaft configurations, and long or short bushing to fit all standard electric guitar styles.

The Model 82 Vintage Guitar Potentiometer has a proven track record with several well-known artists who installed this potentiometer in the late 1970s when it was originally released. These potentiometers continue to provide uninterrupted service today after 30+ years. Guitarists who spend hours in recording studios and who have an affinity for perfect sound will benefit by upgrading their standard potentiometers to Bourns® Model 95 Premium and Model 82 Vintage Guitar Potentiometers.

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### OTHER BOURNS® GUITAR POTENTIOMETERS AVAILABLE

Bourns® Sensors and Controls Product Line now offers a full line of guitar potentiometers including the following:

- PDB241-GTR Series Standard 24 mm Guitar Potentiometer
- PDA241-HRT Series 24 mm Guitar Potentiometer with high torque
- PDB181-GTR Series 18 mm Mini-Guitar Potentiometer
- PDB182-GTRB Series 18 mm Blend-Balance Potentiometer for blending and balancing two pickups with one control
- PDB183-GTR Series 18 mm Guitar Potentiometers with push-pull switch for phase switching capability



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For further technical support and for complete pro audio solutions, please visit

[www.bourns.com/proaudio](http://www.bourns.com/proaudio)

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