



Bryston BIT Isolation Transformer Motivation

The concern Bryston had with a lot of power line conditioners available in the market was that many of them could restrict the current available to the amplifier. An amplifier can draw very high peak current, and wants to 'see' a very low impedance high current source from the power line. In fact, we even stated in our owners manuals not to plug our amplifiers into power conditioners. The Transformer based line conditioners we tested were too small to supply the peak current required and many of them were just Filters and did not provide Isolation -(Isolation means there is no mechanical connection between the outside power grid and your inside system power supply).

Also most of the surge protection was done using MOV's, which are sacrificial and eventually will be destroyed with repeated spikes. Other issues with these MOVs is that they allow much more voltage through before they reacted (typically 300 volts and higher) and they shunt the voltage spikes to ground.

So we decided to try and develop a powerline Conditioner, Isolation and Protection unit that would not have the restrictions of the many units currently on the market from an amplifier performance perspective.

Benefits of Bryston BIT Power Isolation Units:

Benefit #1: Very low source impedance and high current for the power amplifier

Torus power isolation units present low impedance to any electronic device that is connected to them. A Single 20 amp Torus PIU has an output impedance of 0.2 ohms and can deliver 400 amp peaks (instantaneous current). The 100 amp unit only has .04 Ohms of output impedance. A typical 200 watt audio power amplifier demands 10 amps RMS current from a 120 volt line (1200VA) but may demand up to 50 amp instantaneous peaks. The standard residential wall receptacle can't supply the 50 amp peaks because they typically have higher nominal impedance. A Torus 20 amp PIU plugged into the same wall plug can supply these peak current requirements quite easily.

Benefit #2: Power surge protection using Series Mode Surge Suppression rather than MOV's

The Torus power products use the finest, most elaborate surge suppression technology available. Series Mode Surge Suppression does not shunt the spike to ground like MOV's do, and therefore the ground is infinitely more stable in a Torus power device. Additionally, most MOV-based surge suppression units allow as much as 300 volts through to the protected components, easily enough to do substantial damage, where as Torus surge suppression has clamping voltage onset of around 2V above peak nominal voltage. Torus units are built to meet 6000 volts, 3000 amps at 1000 repeats standard.

Benefit #3: Total isolation from outside power grid

Torus power products provide isolation through its finest designed toroidal transformer between the outside power grid and the devices being protected. Such isolation helps to reject external noise sources such as motors, lights, and dimmers commonly found in the home environment. Torus power products provide noise filtering at a range from approximately 2000Hz to over 1MHz – other regular transformer based products do not start operating until nearly 10,000 Hz.

Benefit #4: High Power Capability

There are 15 models of Torus power products available ranging from 2.5 amps to 100 amps and 120/240 Volts. Torus has recently introduced NEMA wall-mount units, which are typically placed at the hydro panel for whole-house or whole-room power line isolation and protection.

Benefit# 5: Low Noise

Bryston BIT products utilize ‘LONO’ (Low Noise) transformer design technology that eliminates audible noise in the power transformer regardless of line conditions, DC offset and over-voltage. Torus products perform at the NC10 level measured on the standard NC (Noise Criteria) – which makes them suitable for use in very quiet environments such as professional recording and broadcast studios.

Benefit # 6: Cleaner Power

Bryston BIT products utilize “NBT” (Narrow Bandwidth Technology) to attenuate differential and common-mode noise without external circuits or components, and starting at a lower corner frequency (2Khz) than other systems. The Torus result is startling – see press and user comments!

Benefit # 7: AVR (optional automatic voltage regulation)

The new feature is Automatic Voltage Regulator (AVR). The AVR would make sure that the output voltage of the unit stays uniform within an acceptable range when the input voltage is either increased from or dropped below the acceptable range. The purpose is to keep the output voltage uniform when the input voltage varies over a wide range from 130V to 95V for the North American models and 260V to 190V for the International models and to shut the system down if the input voltage goes above 135V or below 90V for North American models and above 270V or below 180 for the International models.

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