Westwick Balanced Power

What is it? What are the advantages? How does it work?

8kVa model

2kVa model (no fan)

Our range of balanced power units safely transform and filter a nominal 230v 50Hz AC single phase supply to 115-0-115v balanced power. The core of each unit is a precision wound oversize toroidal transformer with unusual characteristics and a very accurate secondary centre tap. Comprehensive internal component, supply and load protection is incorporated to ensure the final system is even safer than a conventional unbalanced supply system. We currently offer an 8kVa model for rack mounting and a free standing 2kVA version. We also offer a 58-0-58 4kVA 50Hz system for imported equipment, usually from the USA.

What are the advantages?

Balanced power enhances audio visual and data system performance principally by significantly reducing the system noise floor. This directly leads to:

- Increased sonic transparency and dynamic range
- Improved perception of positioning of sound sources within the stereo/surround sound field
- Increased clarity in video picture presentation with reduced artefacts
- Can improve clock jitter in non-optimal digital systems
- Maximised bit resolution for A-D and D-A conversion leading to better performance/utilisation of compression algorithms in the digital domain
- Increased data transfer rates and reduced errors between interconnected digital equipment

As system engineers, we expect (and indeed insist) on balanced interconnects, routing and patching for analogue/digital audio and synchronous/asynchronous data transfer between equipment wherever possible. This reduces susceptibility to interference, both radiated and conducted. Now we can apply this balancing technique to the system distributing the raw power.

How does it work?

The conventional unbalanced power distribution system amounts to a “rubbish” highway – huge numbers of non-linear loads with commutating rectifiers in their power supplies react with the less than perfect power distribution system to produce a cacophony of non-linear, phase shifted currents at frequencies from 50Hz into the 10’s of Mhz. Many manufacturers limit this supply-derived interference just sufficiently to comply with EMC standards, some even selecting the most lax version applicable to their particular product. How do you know which manufacturers are doing this? Many manufacturers also test all parameters of each piece of equipment in isolation on a test bench; at Westwick Installation, we as system integrators often find performance is compromised as the equipment is concentrated in racks and then interconnected.

The Westwick Balanced Delivery System exhibits several beneficial effects:

- Study the circuit of a typical IEC mains inlet filter and you will see it is a balanced component forced to work at reduced performance in a 0-230v Live-Neutral distribution system. By supplying 115-0-115v balanced power, you can realise each filter's full performance in *both* directions (general conducted interference *entering* the equipment and commutating rectifier and digital processing noise *leaving* the equipment to pollute adjacent equipment.
- When a typical IEC input filter is operating in conventional unbalanced mode, the enclosed live-earth capacitor directly injects a small current from the live pin directly in to the earth system. This is principally in phase and additive with the currents from all the other filters fed on that distribution circuit/phase; this current can build up to amps; this current also flows through the metal cases of the installed equipment and the cable screens interconnecting them. Feed it with balanced power and most of that current cancels out. The balancing transformer creates that optimal cancelling condition locally and primarily needs the distribution earth as a fault current safety route and earth reference, not a poorly performing interference current "dump."
- EMC compliant equipment should reject the interference caused by circulating earth currents; it can not however annihilate the effect. Balanced power significantly reduces the cause of earth currents; AV equipment manufacturers can only address the *symptom*, and with varying degrees of success – also, they tend not to routinely test in adverse installation environments.
- Conventional toroidal power supply transformers are wound for maximum efficiency and minimum cost. Simply adding a centre tap to the secondary does not work – we tried! Our manufacturer uses unconventional winding techniques, core materials and construction to achieve a transformer optimised for balancing and interference reduction. Inductance and capacitance characteristics are different to a conventional transformer – they have been optimised to exhibit substantially improved filtering properties – in both directions.
- A useful by-product of the design process for our models is a much reduced primary inrush current – wiring for a Surge-Gard power thermistor is included but this is almost always linked out. There is a connector for an optional internal current measuring Tx.
- Digital data transport, particularly but not exclusively rack-to-rack, benefits from the reduced noise floor of balanced power. Although data leaves the source equipment as 1's and 0's, our intense desire to obtain high bandwidth coupled with cable/connector induced reflections leaves us with plenty of data recovery work to be carried out at the destination. We are prepared to argue that this recovery is quite an analogue process – when does the 0 become a 1? System noise can only degrade the recovery performance – leading to lost data for serial digital audio, packets requiring retransmission for IP data.
- These systems have comprehensive input and output over current protection, output residual current and over temperature protection with 220, 230, 240, 250v input taps.

Westwick Installation advocates the use of meshed earthing systems, PECs (parallel earth conductors), STP Ethernet cables and eradication (in almost all circumstances), of the "One End Only" cable screen termination rule. In our experience, our balanced power system can significantly reduce commissioning time. Legacy audio equipment (and sadly some equipment of current manufacture) possessing an XLR "pin 1 problem" is identified at commissioning and dealt with locally. *** Both the 8k & 2k models shown in the pictures have just been upgraded, improved features: 8k handles, 8k interior access, 8k connection access, 2k & 8k appearance ***

Talk to us about upgrading your current system – even better – if you are starting a new project, it makes sense to research your options. The USA has routinely been installing similar (but 60Hz) systems since 1996; we have in Europe since 2004. We have the consultancy and electrical installation approval procedures to give you a safe, compliant and excellent performing power system together with access to a contractor well used to broadcast installations.

Represented by:
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Westwick Balanced Power Price List

• Professional	8K	8kVA Balanced Power	System	1 o/p	£4,750.00
115-0-115v		8kVA Balanced Power	System	2 o/p	£4,850.00
• Professional	4K	4kVA Balanced Power	System	1 o/p	£3,600.00
115-0-115v		4kVA Balanced Power	System	2 o/p	£3,700.00
• Professional	4K	4kVA Balanced Power	System	1 o/p	£3,600.00
58-0-58v		4kVA Balanced Power	System	2 o/p	£3,700.00
• HiFi	B2000	2kVA Balanced Power	System		£2,495.00

Client List for Westwick Balanced Power Systems

David Gilmour Music - Astoria	Private Studio	Hampton Court UK
Mark Knopfler - British Grove Studios (Voted The Best UK Studio 2009 by the Music Producers' Guild)	Private Studio	London UK
The Soundmasters	Mastering	London UK
Sacha Wilson	Private Studio	London UK
Loud Mastering	Mastering	Taunton UK
Hafod Mastering	Mastering	Wales UK
Ohm Recordings	Private Studio	Bristol UK
Miloco Studios - The Garden	Studio	London UK
Cold Play - The Bakery	Private Studio	London UK
Yong Siew Toh Conservatory of Music	Studio	Singapore
Damon Albarn	Private Studio	London UK
David McEwan	Private Studio	London UK
Bex Audio	Domestic HiFi	Reading UK
Michael Ilbert - Hansa Ton Studio - Berlin	Private Studio	Berlin DE
Max Martin	Private Studio	Stockholm SE

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