Power Inspired's new AG1500S AC mains ReGenerator has been honed for audio. Noel Keywood looks closely at just how well it works.

Power To The People

Cleaning up the mains supply to a hi-fi by using a filter has become a popular idea: it's inexpensive and improves sound quality. One step further than removing high frequency rubbish with a mains filter is to re-generate the mains altogether – and that's what the Power Inspired AG1500S I'm reviewing here does. We've had many requests to review this product because it is relatively inexpensive at £590 but has already gathered a following.

Dedicated mains re-generators for hi-fi systems are complex and specialised beasts costing thousands.

We use an Isotek Evo3 Mosaic Genesis (£8000) to ensure products reviewed aren't tainted by our distorted London mains supply – and it makes a difference.

Power Inspired's AG1500S was not, in original form, purposed for hi-fi use, but as a computer back-up that isolates from mains glitches and can provide power should the mains fail altogether, giving enough time to start an emergency generator. So the AG1500S isn't an Isotek – but is it effective?

Backup mains power supplies are a big issue wherever failure could cause serious problems, in hospitals, data centres etc – and Power Inspired have a wide range. The AG1500S not only produces a clean mains supply free from interference and low in distortion, but is quiet – meaning low cooling fan noise – all requirements for audio. It will switch automatically to running from batteries if so configured but we used it without batteries – an external pack (72V) is additional cost. This review looks at suitability for hi-fi use, meaning how clean a supply it provides. Re-generation isn't a clean process in itself, producing distortion and noise. The issue is for hi-fi: how much distortion and noise?

This unit can deliver up to 1500 Watts (1.5kW). That's a lot – easily enough to drive a typical hi-fi system where an amplifier like our Creek Evolution 100A is rated at 600 Watts (but consumes much less in ordinary use) whilst peripherals like Streamers, CD players, turntables and what have you typically consume around 100 Watts. There's plenty of leeway to plug in a whole system, even those with current chewing valve amplifiers – and if it's all too much protection circuits prevent overload.

As a dummy load I plugged in an electric fire with 400W (resistive) elements to see how the AG1500S would cope and it drove three elements (1.2kW) simultaneously without difficulty. I ran two elements drawing 800 Watts – 50% load indicated by the front panel display – and it remained silent; the fans did not speed up even after one hour, in a room at 25C ambient (a rare sunny day in the UK!).

> "It may look a bit industrial, but the AG1500S has massive ability"

Distortion from the AG1500S is rated as 1% typical and we measured less than 1% (see Measured Performance for more detail) so

It looks like a hi-fi amplifier in layout, with sheet metal chassis, circuit boards and electrolytic capacitors, but numerous sturdy wound coils and frame transformers point to another purpose.

it does clean the mains since our supply comes in at 3% distortion. However, the Isotek produces 0.3% maximum so the AG1500S doesn't provide the improvement a dedicated hi-fi unit achieves, but it offers more power, so there are trade offs.

Since power amplifier manufacturers like Naim prefer their amplifiers to be run direct from the mains, with nothing in the way – see our boxout on this – the issue of power isn't necessarily critical; the AG1500S has so much leeway here it allows experiment, but the lesser AG-500 at just £295 is better value perhaps, especially if the power amplifier doesn't need such a supply.

Physically the AG1500S is large – necessary to handle 1.5kW. It fits a professional 19in rack so will fit most hi-fi racks/stands that also meet this universal standard, but is best kept away from the hi-fi; rack mounting in this context is not a good idea (see The Technology). It can also be stood on its side using clip on feet, perhaps on the floor, flat against a wall behind a rack to take up minimal room space. Dimensions are 438mm (17.2 in) wide, 420mm (16.5 in) deep and just 80mm (3.2in) high, weight 8.5kgs (18.7 lbs). It accepts a wide mains voltage input of 120V-295V (50Hz or 60Hz) – fine for the UK and most other countries, if not for U.S. 110V.

Build quality is conventional, a sheet steel chassis covered by a sheet steel case. The front panel carries a small LCD display panel and three push buttons: On, Off and Select. The display shows input (mains) voltage and frequency, as well as output voltage that can be set to 208V, 220V, 230V or 240V; I used 240V that gives rated power from amplifiers. It also shows output frequency and load in terms of percent of 1500W – and I never got past 30% (500W) on this display with hi-fi equipment, including a valve amplifier. There is protection for output overload, over-temperature and short circuit, as well as low battery volts. The LCD display shows these conditions too but in use the unit can be set to output volts and left there. It is claimed to be 90% efficient and did not get hot in use, running at 30C with 30% load – I did not get close to using its full 1.5kW capacity.

The rear panel has a high power IEC C20 input socket and a matching mains lead with 13A UK style mains plug is supplied. There are six IEC ('kettle') output sockets providing regulated output, plus one high current IEC C20 outlet for a mains distribution block with 13A output sockets that is supplied. There's also an overload re-set button here, d.c. battery inputs, two fans and a USB / RS232 / EPO computer (PC) panel for monitoring that I did not use.

A high power mains lead with 13A UK style mains plug IEC C20 line socket is supplied, plus a mains distribution block with high current IEC C20 line plug and 13A output sockets.

THE TECHNOLOGY -

In the world of power supplies the AG1500S is termed a 'double conversion' design. It turns incoming a.c. mains to d.c. to charge batteries. It then turns d.c. from the batteries back to a.c. at required output voltage. The batteries don't have to be there; they only provide support for mains power failure.

From a hi-fi point of view it is the conversion back to a.c. that matters as it involves chopping the d.c. at high speed before passing it through a high frequency transformer. A similar technique is used in switch-mode power supplies, infamous for producing radio noise and a dirty a.c. output. Not a good start then.

However, both problems can be suppressed, using r.f. screening and d.c. smoothing from large capacitors and voltage regulators. Just how effective such measures are can only be judged by measurement – which is why we measured the AG1500S thoroughly.

For hi-fi use it is crucial that output is substantially cleaner than the mains, meaning distortion less than 1% and no high frequency noise. This cleans transformer leakage currents within hi-fi products, reducing noise and hash in the sound.

Supplies like this, including switch-mode types, are best placed as far from the hi-fi as possible to avoid any possibility of RF interference intruding, especially into turntable pickup cartridges and phono stages. This cuts out rack mounting, but floor standing a few feet (er – a few 0.3 metres) distant is suitable.

The rear panel carries six IEC power outlets, plus a high current outlet for a 13A mains block. Also, there are two cooling fans, an overload re-set switch and computer monitoring outlets (right).

The fans start up vigorously but slow down to a quiet idle unless temperature rises. Fan noise is an issue for hi-fi use: the unit must be effectively silent – and it was with an 800 Watt load run for one hour. The fans will speed up to keep things cool if a heavier load is driven but this is unlikely with a normal hi-fi system, even one equipped with valve amplifiers.

SOUND QUALITY

Re-generators clear hash from the sound and add both detail and focus – and that is broadly what the AG1500S did wherever I used it. It brought a sense of deep background silence to the Martin Logan Impression 11A loudspeakers, putting space between instruments of the Trondheim Soloists, painting the violin of Marianne Thorsen into stronger relief against the background. The sound seemed firmer, more solid and stable. The AG1500S starts with a strident squeal from an internal warning alarm before powering slowly to full output after a delay of 5 seconds or so. I ran the entire review system of two powered loudspeakers, Oppo Universal player and Icon Audio Stereo 30SE valve amplifier from the four way mains distribution block supplied, which it handled easily (26% capacity).

Swopping from AG1500S to our Isotek was not a night-and-day difference. The Isotek put a tad more detail into the sound, giving cymbals a slightly richer quality and making violins sound fractionally more embellished. I would have to use the Isotek for reviewing electrostatics that are all about such resolution, but for everyday use the AG1500S did a fine job sonically.

CONCLUSION

The AG1500S re-generating supply has massive capacity and can run any hi-fi system easily; I could not get it past 30% of full power, except by using a dummy load. It is awkward to set but once done easy to use: just press On or Off. It cleans the mains as claimed, to below 1% distortion and removes noise too, our measurements showed, usefully improving sound quality. It may look a bit industrial, but the AG1500S has massive ability at a good price.

A BAD IDEA?

Power amplifier manufacturers in particular may object to anything between their product and the power station, because notionally it will compromise voltage regulation and – potentially – bass quality. Both manufacturers and their dealers may advise against such supplies, but it's best to judge effectiveness by listening test: ask for a home demo.

If an amplifier's mains transformer suffers leakage because it's cheap, a clean mains supply will lessen distortion from ground currents and sound will gain clarity, especially through high gain internal phono stages.

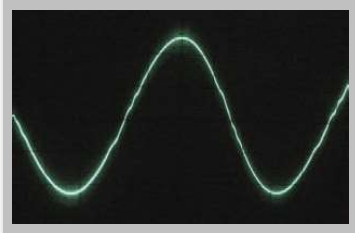
Note that real life power consumption of most amplifiers is far lower than the peak figures commonly quoted. Surge currents at switch-on may trip protection circuits all the same: only a demo or trial can reveal this potential problem.

MEASURED PERFORMANCE

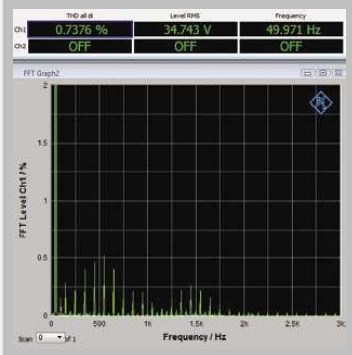
An ideal hi-fi mains supply should deliver (in the UK) a 240V – or thereabouts – pure sine wave at 50Hz, with no distortion or noise.

When set to 240V the AG1500S delivered 240V at 0.7% distortion under no load and 0.8% distortion at 800 Watts load, the front panel display accurately showing 50% loading under the latter condition. As claimed it delivers less than 1% distortion, which is a large improvement on our London mains supply at 3% that appears to be representative of the UK. The AG1500S typically reduces distortion by a factor of four irrespective of load.

OUTPUT WAVEFORM



DISTORTION



Our distortion analysis shows residual distortion harmonics up to 2kHz that varied little with load, so the unit does not modulate heavily according to current draw – a very good result from a complex d.c. to a.c. convertor capable of delivering high current.

An extended analysis to 250kHz showed no high frequency noise, except for a small noise cluster at 20kHz, but it was far below distortion harmonics stretching to 2kHz.

With an 800 Watt load driven for one hour the cooling fans remained quiet and the casework was cool.

The AG1500S does, as claimed, reduce mains distortion to less than 1%, and it also eliminates noise. It provides substantial improvement in mains quality and remains silent and stable in behaviour even with a very heavy load applied, being able to drive a large hi-fi system without difficulty. **NK**

AG1500S AC REGENERATOR 1500W PSU
£599.00

EXCELLENT - extremely capable

VALUE - keenly priced

VERDICT
A useful upgrade Complex but impressive – especially at the price

FOR
- improves sound quality
- huge power capacity
- runs quiet

AGAINST
- large
- awkward to set
- more distortion than dedicated hi-fi units

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