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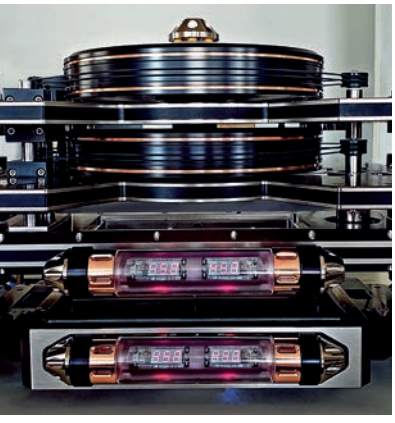

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IsoTek

In days of old, our AC power was reasonably free from noise and distortion, but even then many commented that the later the listening session, the better the system sounded. Today, we live with very 'dirty' mains plagued with differential mode and common mode noise thanks to a plethora of noisy power supplies and wireless network devices polluting the electrical environment. Fortunately, there's IsoTek to the rescue!

For more than 20 years, IsoTek Systems has been producing a range of 'clean power' conditioners, regenerators, filters and DC offset blocking devices. These can revolutionise the performance of anything from the humblest audio system to the highest of high-end audio electronics.

IsoTek has a constant development cycle and is always looking to the next great innovation in power products... and in many cases that comes from IsoTek itself.

isoteksystems.com

IsoTek V5 Aquarius power conditioner

by Alan Sircom

IsoTek has a significant range of power products, but perhaps the one that has always been resoundingly popular is the Aquarius. Its predecessors – the Mini Sub and then GII Mini Sub – put IsoTek on the map. Both the Mini Sub models and subsequently the EVO3 Aquarius that followed were conditioners admired by those most reluctant and curmudgeonly of power product buyers – Naim Audio users. Having been programmed not to like the idea of power conditioners by Naim's most zealous supporters, they bought the Mini Sub and EVO3 Aquarius in droves. However, time moves on and the EVO3 line is making way for the V5 models from IsoTek and they come in their spiffy new livery. How will IsoTek's buyers react?

The IsoTek EVO3 Aquarius was first debuted at the Munich High End Show in May 2009 and officially released to market towards the end of 2009. Since then, EVO3 Aquarius has been considered a benchmark for mains cleaning as it represents that sweet spot of performance and value for money - not only within just the IsoTek range, but in a wider context.

V5 is a bold departure for IsoTek. The company has used a very similar case work for its products throughout the 21st Century. It's established as IsoTek's 'look'... and the V5 line migrates from that look completely towards something far more 'now'; cleaner lines, curved edges, all very modern and minimalist. There's the option to have the IsoTek V5 Aquarius in black or silver; it has previously been available in black and silver, but until V5, the black version always looked like a bit of an afterthought (at least, it did to me.) Not so now – it is rightly marketed as a beneficial feature.

Today's V5 Aquarius is a multiple power cleaning system, featuring six independent power cleaning networks in a single chassis, two outputs running for high-current devices such as power amplifiers, while the remaining four are designed for preamplifiers, source and network components. As with the EVO3 it replaces, its role in life is to reduce Differential Mode Mains noise, and the risk of cross-contamination between individual inputs, so that the connected loads do not influence each other's performance.

The V5 Aquarius, along with the rest of the new V5 range, might be the product of a total redesign from the ground up, but it still stays true to the company's design principles. This meant IsoTek's team subjected the EVO3 Aquarius to rigorous questioning to reconsider and ultimately improve its job in hand, the result being the V5 Aquarius. It appears no single element was overlooked in the V5-ification process!

The changes are big. First, V5 Aquarius now incorporates two thermomagnetic fuses, one rated at 16A for the two high-current power output sockets, the second rated at 6A for the four remaining medium-current output sockets. A standard fuse – by virtue of its electrical function – relies on a very thin piece of wire to overheat and break contact; this is just as true of expensive audiophile grade fuses. The IsoTek thermomagnetic fuse system offers an increased contact area at least 1,000 times greater than that of a standard fuse, and a connection which is consistently strong. It is a substantial upgrade, which also makes re-setting the device easy.

The V5 Aquarius' PCB topology has also been significantly upgraded, with PCB copper loading said to be increased by over 35% to improve amperage and decrease resistance. Critical bespoke components also have better overall tolerances with improved inductance and current handling. As a result, the new circuit is said to offer twice the inductance with a claimed 40% increase in current.

Dramatically improved DCR (direct current resistance) has been also applied throughout the design. IsoTek's key goal is to reduce DCR, bringing performance closer to the zero Ohms idea, V5 Aquarius is claimed to improve performance by 25% in comparison to its predecessor.

These technological improvements result in the V5 Aquarius delivering greater power, with unrestricted current delivery within what the power company can supply, and regulations allow. Generally, for power amplifiers or high wattage electronics, IsoTek provides outputs that offers ▶

"Despite statements to the contrary, this is precisely where correctly specified materials matter most."

extremely low impedance and low DCR, which completely eliminates (within the concepts of power filtering) any possibility of current restriction and enhances dynamic range. By way of contrast, when power is contaminated, dynamic range is reduced.

The limit, of course, is the mains supply. The very principle of AC power is that it doesn't store energy in the transmission system. As a consequence, a power reserve within an AC circuit does not and cannot exist.

Power reserve would require the voltage to increase as Ohm's law insists it must, so saying a circuit doesn't sag isn't a reserve of power. The AC waveform goes between maximum and minimum points at 50Hz in 10mS, it then swings to the maximum negative value. At 20mS, a full cycle is achieved. Therefore, the average values of an AC waveform are in fact zero. Only as a power wave can it be positive, due to the law of squared negatives. It looks like a ballooned sine wave where the value of 45 degrees is 0.5 not 0.7071 from a trigonometric table. Were this only a voltage wave it would have a long-term value of zero. As far as energy storage is concerned zero is the value of stored energy. Therefore any attempt at energy storage would produce a phase shift, which is sometimes described as negative energy.

Direct Current resistance (DCR) will cause sag. To put it in other words, a system has to be developed which does not limit the power reserve of the power station, meaning a circuit needs to have extremely low resistance whilst maintaining sufficiently high inductance. When done correctly and in perfect balance the inductance is virtually zero at 50/60 Hz and the DCR is also very close to zero. Therefore, an ideal filter circuit must maintain zero Ohms resistance DC (or very close) and considerable AC resistance to noise above 50/60Hz. Despite statements to the contrary, this is precisely where correctly specified materials matter most. While some might consider these 'exotic', they represent a critical and important part of the function and appropriate to use. IsoTek filter designs can maintain very low resistance at 50/60Hz but have very high amounts of noise cancellation above that frequency.

Most AC circuits are reactive – they produce a reaction either from the power drawn or the circuit itself. Put simply, they are not pure resistors and behave like a capacitance and resistance or an inductance and resistance. In an ideal world, the only allowable impediment is resistance and ideally this needs to be extremely low. This is something of a dilemma, do you want high transient power, or do you want heavy filtration? It's possible to have both, but to do so one must have components of the very highest quality, which are designed specifically for purpose with the correct architecture. This is


IsoTek V5 AQUARIUS


IsoTek V5 AQUARIUS

extremely complex and does not exist outside the world of specialist power engineering.

In the V5 Aquarius, IsoTek has to tow a careful path, too big a series of changes, and the company risks losing the kind of people who buy the product. Too few and it's a 'meh!' launch. IsoTek – like any company – also needs to keep abreast of the world outside of its factory gates; what its competitors are doing, what systems people are using its components with today – and potentially more importantly, those who aren't investing in IsoTek's products... and why.

IsoTek has been doing just that in the run-up to the release of the V5 Aquarius. This seems to be more than just another product launch; it's more a labour of love. According to IsoTek, just getting the industrial design right took almost 12 months of rigorous quality control checks to maintain consistency of fabrication. The internal design has also followed the same passionate pursuit, with ongoing critical listening tests, a considerable amount of measurement and a full shake-down of the design in every conceivable way.

The only way to really evaluate that is a spot of side-by-side comparison. I know the EVO3 Aquarius well (I knew the GII Mini Sub it replaced quite well too), and know both its strengths and its weaknesses. And the first problem for the V5 Aquarius was the EVO3 was mostly strengths and not many weaknesses! To build a better EVO3 Aquarius was enough of a daunting prospect that it took IsoTek more than a dozen years to make a viable replacement that is claimed to improve on the EVO3. But, deep down, does it?

Oh, hell yes! It's little wonder the EVO3 Aquarius proves popular with the Naim fraternity, because it has really good musical timing (more accurately, it gets out of the way enough to let the system play good timing), but the V5 Aquarius makes the EVO3 sound like it's on strong antipsychotics. OK, so there's no drooling or slurred speech involved, but where the EVO3 delivers good rhythm, the V5 is peppy, immediate and upbeat. It simply leaves the EVO3 behind. Given the EVO3 is already considered one of the most fast reacting power conditioners, and that the V5 leaves it almost for dead, this new chassis (and what it contains inside) is something of a revelation.

And the V5 reveals itself when playing some swampy country rock, such as Larry Jon Wilson's 'Ohoopie River Bottomland' [Heartworn Highways, Light In The Attic]. This is a great and mostly unsullied recording, with an infectious beat but one that's prone to getting lost in the ensemble. Any sense of reticence on the part of the power conditioner makes this track sound almost tired in the middle eight (the key change is so relaxed, you barely notice it until after it happens). Here, everything is just perfectly balanced and pitched. The EVO3 reacts fast to this kind of music, faster than many in fact, but the V5 just reacts faster.

If it were just those timing benefits and nothing else, the V5 would be something to shout about, but it's more than that. One of the big excuses for holding out on a power conditioner is that - although it might demonstrably improve the spaciousness, the detail retrieval, lower the noise floor

"Once again, the IsoTek Aquarius EVO3 did good; the IsoTek V5 Aquarius did better. Much better."

and let the components 'time' better, they mess with the dynamic range... so I'm out! I can sort of sympathise; a power conditioner that improves nine out of ten things, but wrecks the last one, isn't worth keeping. And when it comes to dynamic range, for power conditioners, the only way is down; you can't extend that range because the limit is the AC mains itself; all a good power conditioner can do is reduce the loss to the dynamic range. And the V5 Aquarius once again scores a hit here. Play something with a spot of bombast – Rachmaninov's Symphonic Dances [Telarc], for example – and many conditioners just flatten out the sweeping power of the orchestra. Once again, the IsoTek Aquarius EVO3 did good; the IsoTek V5 Aquarius did better. Much better.

There wasn't any test I could perform where the EVO3 scored better than the V5. The EVO3 scored extremely well in all these tests; detail retrieval, sound staging, image stability et al. The V5 improved on the EVO3 in each area of performance, and then went further, it drew the sound together in the way only the very finest of this type of product can. That's a joy to find at any price.

I'm not finding anything to dislike about the IsoTek V5 Aquarius; it looks great, it brings the best out of the sound of your equipment and if its predecessor is anything to go by it will be hugely popular and be incredibly reliable. Excellent! +

TECHNICAL SPECIFICATIONS

Type: Power conditioner
Number of outlets: 6
Outlet options: UK, EU, US, AU, CH
Mains Inlet: 16A IEC C20
Mains voltage: 100–240V/50-60Hz
Medium current (230V): ×4 (6A, 1,380W total)
Medium current (115V): ×4 (6A, 690W total)
High Current (230V): 2× (16A, 3,680W total)
High Current (115V): 2× (16A, 1,840V total)
Surge Protection: 81'000A
Available in Black or Silver
Dimension (W×H×D): 45 × 11 × 35cm
Weight: 10kg

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