



ISO TEK EVO3 SYNCRO



Reviewer:	Marja & Henk
Sources:	PS Audio PWT; PS Audio PWD; Dr. Feickert Blackbird/DFA 1o5/Zu DL-103; Phasure NOS1 DAC [in for review]
Streaming sources:	XXHighEnd; iTunes; Devialet AIR
Preamp/integrated/power:	Tri TRV EQ3SE phonostage; Audio Note Meishu with WE 300B (or AVVT, JJ, KR Audio 300B output tubes); Yarland FV 34 CIISA; Qables iQube V1; Devialet D-Premier; Hypex Ncore 1200 based monoblocks; KR Kronzilla SX Eco [in for review]
Speakers:	Avantgarde Acoustic Duo Omega; Arcadian Audio Pnoe; Vaessen Aquarius; Crystal Cable Arabesque Mini [in for review]
Cables:	complete loom of ASI LiveLine cables; full loom of Crystal Cable cables; Nanotec Golden Strada #79 nano 3; Nanotec Golden Strada #79; Nanotec Golden Strada #201
Power line conditioning:	Omtec Power Controllers; PS Audio Powerplant Premier; PS Audio Humbuster III; IsoTek Syncro; Blue Horizon distortion meter [in for review]
Equipment racks:	ASI amplifier and TT shelf
Sundry accessories	Furutech DeMag; ClearAudio Double Matrix; Nanotec Nespa #1; Exact Audio Copy software; iPod; wood, brass, ceramic and aluminum cones and pyramids; Shakti Stones; Manley Skipjack; Blue Horizon footers [in for review]
Room treatment::	Acoustic System International resonators, sugar cubes, diffusers
Room size:	ca 7 x 5m with a ceiling height of 3.50m, brick walls and concrete floor downstairs, ca. 14.50 x 7.50m with a ceiling height of 3.50m, brick walls, wooden flooring upstairs.
Price of review item:	€950

A pre filter for the AC aka the IsoTek Evo3 Syncro. We all know it. The mains supply we connect our precious audio gear to is far from perfect. It is full of noise by way of RFI and EMI. Our review of the Blue Horizon Noise Analyzer depicted the reality of this grim outlook in unexpected detail.

One thing that noise analyzer however did not show was another unwanted component that rides the mains lines like an evil freeloader. This is a DC offset component. Somewhere literally down the line there is an asymmetrical load. This load on the mains can last for a varying amount of time, often from between a second to a few minutes.

Then it vanishes again only to return later. From 'our' end its behavior is utterly random. One of the reasons that late-night listening can be so favorable is that this transient DC pollution is





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less than during the day. What exactly such DC pollution will cause to our hifi varies with installations. In many cases DC signal will cause transformers to vibrate which can be heard directly as a mechanical buzz. It gets worse when that mechanical vibration triggers micro phonic tubes in the circuit. This can happen not only to the piece of equipment with the resonant transformer. Vibrations can also travel through the audio rack to another device and cause havoc there. It's one of the reasons all manner of footers and isolating devices have an effect.



It all goes back to this exchange of physical resonances between components. Smaller toroidal transformers are less prone to the detrimental effects of DC offset, however larger transformers of this type are very sensitive and might suffer momentary saturation.

DC offset on the mains causes the normal AC sine wave to become asymmetrical. Here in Europe we talk of getting 240V out of the wall but in fact that's the RMS Root Mean Square voltage. The real peak-to-peak voltage of the AC sine wave should be multiplied by $\sqrt{2}$ or 1.414. Doing so arrives at 340V. With an asymmetrical load from 'somewhere' this peak-to-peak figure will drop by about 1V.

So what you say. This can't possibly be significant. At first sight that's true. But now we're going to look at the average DC voltage. It will be around 300mV. That's what will cause problems in our hifi equipment. This 300mV enters a transformer with a primary DC resistance of 2Ω . There will be a current of 150mA in that primary which is excessive. It will cause the transformer's core to saturate during the negative half cycle of an AC wave. For toroidal transformers such a situation is far more serious as this type has no air gap to prevent current rises when the inductance drops.

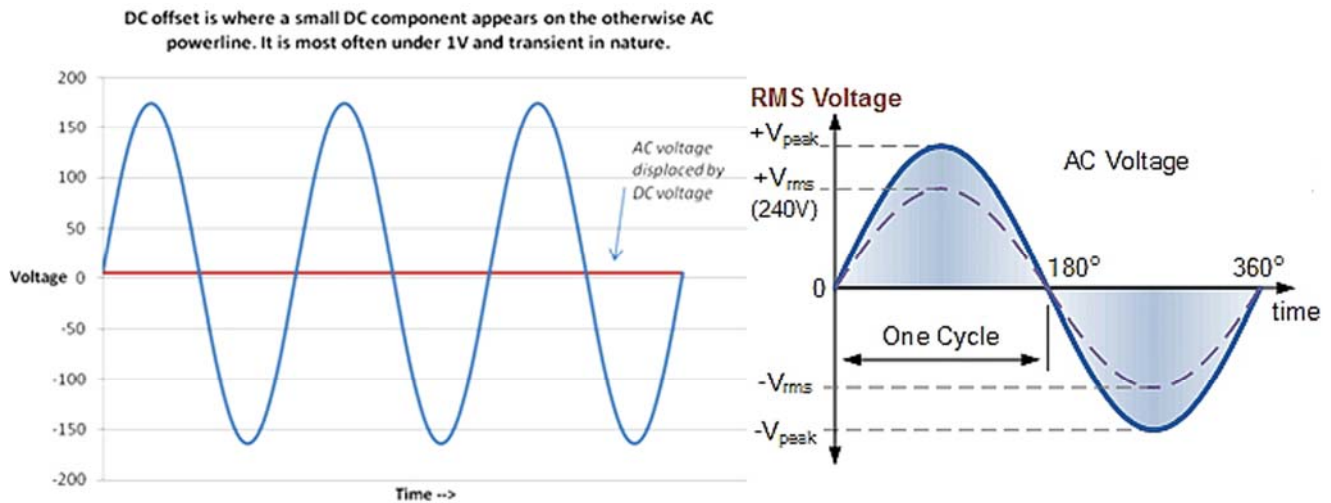
What can one do to prevent DC from entering the power supplies of our hifi equipment? Unfortunately just putting a capacitor in series with the incoming AC won't do. Sure, DC won't pass a capacitor but a capacitor might get into



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resonance with the transformer primary we mean to protect. When things get into resonance at the mains frequency we can expect fireworks followed by tears as our precious audio gear gives up its ghost. Therefore such a capacitor needs protection. The best way is an added diode network. Needless to say the value of our capacitor should be well calculated and the capacitor/diode network should not warm up due to ripple currents. It should not be built up with just one electrolytic to establish longevity and it should be suited for the maximum current the transformer will draw.



All that is fine when such a DC filter is tailored for a specific device whose performance values are known. In the real world audio designers for some unknown reason - !? - do not equip their power supplies with adequate DC filtering. Hence their transformers are prone to buzzing.

Third parties to the rescue! In our last few homes we suffered from such DC pollution. In one case it was really severe and caused by agricultural pumps which started and stopped at irregular intervals to also cause sags on the mains voltage. The use of a power regenerator only solved the latter part of the issue. DC still troubled mainly the powered woofers of our Avantgarde horn speakers. A PS Audio Humbuster became the working solution to silence the buzzing beneath the horns. However there was a restriction. The Humbuster was to be used only after the regenerator and only for the two woofer amplifiers. Any other configuration had a negative impact on the overall liveliness of the system.





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At the Milan show we talked to Keith Martin of IsoTek. As a result he sent us an IsoTek Evo3 Syncro with the promise that it would improve our lot by a lot. According to his publicity, "in designing the Syncro, the challenge for IsoTek was to offer a universal solution that would remove the unwanted and damaging DC component from the mains supply whilst allowing the maximum possible current to pass.

IsoTek's latest engineering solution and DC-blocking technology developed for the Syncro is in many ways superior in performance to a massive 12,000VA isolation transformer by delivering greater dynamic ability."

In our current domestic situation - in yet another peaceful rural area, not downtown Rotterdam - there is not merely radio on the mains. There is also DC as our still resident Avantgarde woofers reminded us with some buzz. This was an ideal scenario to test the Syncro in. When the package arrived we found ourselves with a good-quality box that felt surprisingly heavy. Once opened there was a 204cm long blue power cable inside terminated with a Schuko connector on one end and a female IEC on the other. Both connectors were a beautiful translucent purple plastic

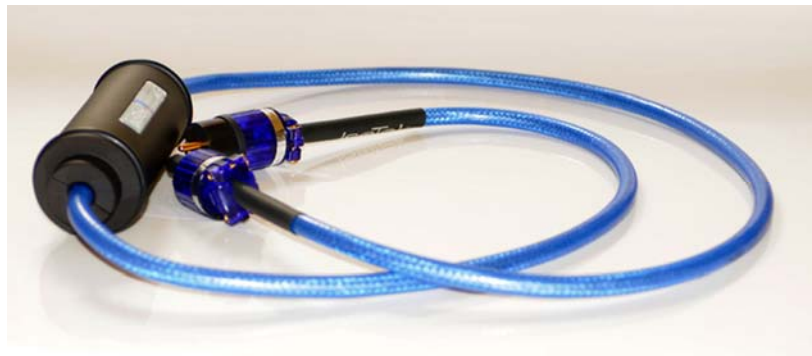




with gold-plated screws and pins. At 77cm from the Schuko connector sat a 20cm long black canister 7cm in diameter. Clearly this was the cause of the overall weight. Finished with two rubber rings on either side to prevent scratching, the canister sported an IsoTek logo and blue LED. Through the blue sheath the underlying mesh shielding of the blue cable twinkled at the beholder. Overall finish was good.

Installing the cable was easy once the considerable weight of the active component was taken into account. Letting the cable dangle unsupported from an elevated wall outlet would not be recommended. The strain on the wall outlet and/or the Schuko connector would be substantial. Proper support is needed.

First we compared the workings of the Syncro with those of the Humbuster. The latter has two outlets so we only did a 'mono' comparison. Right after powering up of the woofer amplifier the difference was clear. Where the Humbuster had left a residual buzz when getting up close to the driver, the Syncro quieted things down all the way, even having us recheck that the woofers were really powered up at all.



Now we progressed to the setup IsoTek recommends – to use this device as a pre mains filter in front of a power conditioner (or in our case a power regenerator). In this setup the buzz-prone active woofers were both fed from a separate zone, all other equipment from other zones and where possible - with components not interfering as confirmed by the Noise Analyser - grouped together in a Furutech power distribution block. As with the prior setup



the woofers were dead quiet. But there was more. It wasn't just that the speaker bass systems had been silenced. The entire system showed benefits from this pre filtering.

As the Noise Analyser had indicated before, the PS Audio PPP perfectly filters any and all mains noise the Analyser is capable of detecting. This is in sharp contrast to the description of the PPP which states that the device has no filtering objective*. Our assumption remains that the conversion from a US-based 120V

* The PPP has a display option that shows THD in percentages for incoming or outgoing voltage but we think it is a bit crude and not as easy to use as the Blue Horizon Analyser.

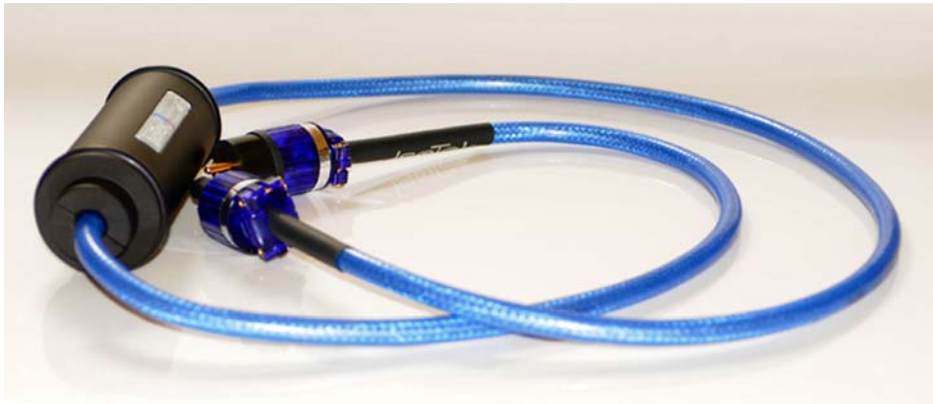


design to our European 240V version by means of a step-up transformer added adequate filtering.

So how did the Syncro behave once connected to the Noise Analyser? Was there any measurable difference? Armed with the Analyser, an iPad with dB measuring app and a home-made IEC-male- to-C2 shotgun converter cable, we attacked. The wall outlet we used showed a reading of 592. The analyser's speaker spit out noise and a radio station that caused the dB meter to show 70dB on the iPad. Leaving all things at the same relative distance we swapped the metering cables and inserted the Syncro. As expected and advertised, there was no difference. Same 592 reading, same 70dB noise, same radio station. The Syncro filters DC, not RF.

We conclude that the Syncro is indeed an effective DC-on-AC filter just as advertised. This not only prevents power transformers from buzzing but also cleans up the overall system's sound especially at very low volume settings. On top of that the Syncro does not appear to introduce any sonically adverse effects. It's thus a perfect solution for replacing any wall-to-conditioner power cable and to add DC filtering to your conditioner or regenerator of choice.

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So how did the Syncro behave once connected to the Noise Analyser? Was there any measurable difference? Armed

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Condition of component received:

Website comments:

Human interactions:

Final remark:

Quality of owner's manual:

Pricing:

Excellent.

Manufacturer's website is informative and well maintained.

Friendly and honest but not always as quickly responsive as hoped for.

This pre filter DC - cleaning cable is unique on the market and should be considered mandatory by all who currently run a power conditioner, power bar, outlet multiplier or power regenerator.

N/A.

Fair for the results.

Marja & Henk