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DACS Purity Headphone Amplifier

Decadent hi-fi sound for all your favorite headphones



REVIEW BY PAUL VNUK JR.

We met UK-based DACS when we reviewed the HeadLine Guitar Switching System in July 2020. DACS has a 30-year history of building microphone preamps, analog effects, high-end headphone distribution amps and more. DACS now turns its attention to a single-channel audiophile-grade headphone amp, the Purity Headphone Amplifier.

Pure and Simple

Purity is quite sizeable in scale yet minimal in its layout and operation. Purity is 4" in height (feet included), 8.25" wide and 9.8" deep. On the front plate is a large, smooth ALPS Blue Velvet level pot equipped with an LED that pulses red through purple to blue as the transistor heatsinks reach thermal equilibrium and as the Class A bias voltage settles. When it glows blue Purity, it is ready to play.

Headphone outputs include 1/4" TRS and a 4-pin XLR output for use with balanced and electrostatic headphones. A small 2-position toggle switch selects between balanced XLR and unbalanced RCA (phono) input, and there is a large master power switch.

Around Back

Purity accepts balanced signals via XLR - 1/4" combo connectors or unbalanced signals over RCA phono inputs. Binding posts are available for grounding, and there is an IEC mains socket.

On the Inside

The double-tall, well-ventilated chassis is dedicated to open space and airflow. Purity also employs a sizeable Noctua fan to keep the proceedings cool—even when on, it's exceptionally silent.

The Tech

Purity features a Class-A drive topology.

The balanced input is a differential instrumentation format design with a hand-trimmed CMRR (common mode rejection ratio). The balanced differential output sports two independent amplifiers that DACS claim exhibit minimal crosstalk thanks to a zero Ω output impedance with a star earth grounding scheme.

The Purity BDZ Power Supply, according to DACS, is "a super stable, super low noise op-amp-based design, with a zero Ω output impedance."

Hookups and Headphones

I tried Purity connected to three different interfaces with 13 sets of headphones and 5 sets of in-ears—yes, I may have a headphone addiction, thanks for asking—with impedances ranging from 10 Ω to 170 Ω . Sadly I did not have any genuinely hi-impedance, nor electrostatic options.

Since my RME ADI-2 DAC FS offers parallel balanced and unbalanced outputs, I was able to audition and switch between both simultaneously. I noticed zero level or sonic differences between the XLR or RCA input.

Purity offers an incredible amount of headroom and gain. The only issue to be aware of is that unless you are using a straight D to A converter, your interface and the Purity each offer their own level control. DACS recommends starting around -18dB on your interface to ensure you are not driving into the Purity too hard, which some headphones may not like.

Audio Bliss

In every instance, Purity added more body, dimensionality and delicate details to the soundstage. We are talking in the 5-15% range compared to other high-quality headphone amps, yet that is significant in the high-fidelity audiophile world.

A Second Opinion

To ensure I was not crazy or hearing things, I took the Purity to Mystery Room Mastering in Madison, WI, to get the opinion of mastering engineer and regular RECORDING contributor Justin Perkins.

Justin has a few high-end headphone amps on hand and regularly uses the Audeze LCD-5 headphones in his mastering work. Justin called the Purity a great balance of transiently fast yet silky smooth. He also felt that it complemented the LCD-5 well, revealing a bit more of the headphone's low-fullness than said headphones exhibit with other headphone amps.

Gain:	+10dB Unbalanced, +3dB Balanced
THD+N:	0.00078% @ 1 kHz +18dBu input, 0.00095% 20 Hz–20 kHz
Output Impedance:	<0.1 Ω
Signal To Noise:	124dB
Inter Mod Distortion:	<0.005%
Dynamic Range:	124dB
Frequency Response:	5 Hz–20 kHz +/-0.15dBu

He really liked the sound—a lot. Still, he did wish that, like his current headphone amp, it could bypass its level control to allow him to rely on level matching and comparisons using the volume control of his various converters and regular setup.

Luckily, he confirmed that it did sound THAT good, and I was not hearing things.

Bottom Line

The DACS Purity and a good set of high-end headphones yields one of the most gorgeous listening experiences I have ever had in my life. This is an audiophile device of the highest order, and that fact is reflected in its price tag. Having said that, I spend hours upon hours

listening to and mixing music, and it has been a while since I have wanted an audio device more—there is some serious audio mojo happening in this box! ➤

Price: \$2,299

More From: dacs-audio.com

Two questions with DACS Managing Director Dr. Douglas Doherty

Why does Purity sound this good?

One key factor is the frequency response—the input stage, which is, in effect, a high pass filter, is virtually flat down to below 5 Hz. Around the frequency where filtering starts, there is always a slight phase shift that blurs detail; ours is so low that it does not affect the phase of even the deepest recorded sounds. This maintains the detail and transparency in the bass. On the top end, roll-off starts around 40 kHz.

The other secret is the BDZ power supply. Under every condition, it maintains a zero Ω output impedance, a rock-steady output voltage, and is very responsive to demands for power. This means big impulses and transients are never compromised.

Our central aim is to force the headphone diaphragms to ALWAYS follow the signal as closely as possible. The amplifier's output must therefore be an amplified identical copy of the input, regardless of the load the headphones present.

To achieve this, a very powerful class A design has been created that presents a fixed low output impedance over the whole of the signal cycle and dynamic range. As they follow a complex audio signal, headphones both consume and generate current due to the inertia of the diaphragm assembly, which acts both as a high-speed motor and a dynamo. The DACS design of a strong, virtually zero Ω output amplifier, as well as the BDZ PSU, ensures the output never deviates in any way from the input.

How does Purity compensate / self-adjust for any impedance headphones?

That is a very interesting question! It doesn't. The difficulty in designing a good headphone amplifier is that it needs to be able to provide high current into low-impedance headphones and high voltage into high-impedance headphones, as well as deal with variations in impedance over frequency. In practice, our design ensures that what you put in is what you get out, regardless of the headphones' impedance.