Revelation RX2 PRO – high-end two-channel amplifier from Brax

Engineering perfection

With the RX2 PRO, Brax is announcing nothing less than a superlative power amplifier, packed with innovation and the brand's first Class D design. We were able to get one of the first units to test.








FOUNDERS EDITION
REVELATION
RX2 PRO
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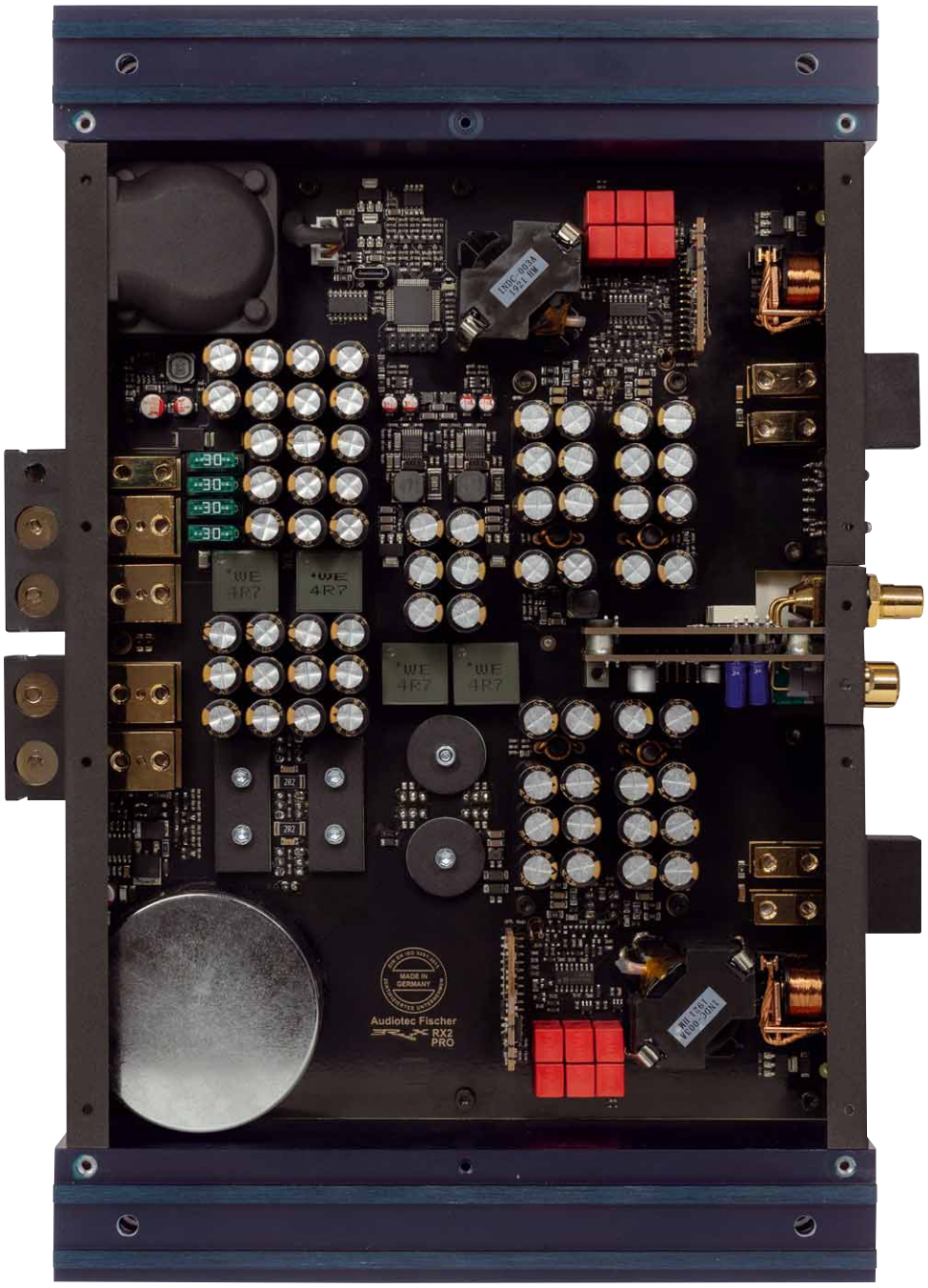
Audiotec Fischer, based in Schmallenberg in the Sauerland region of Germany, maintains the brands Match with small, practical plug-and-play devices, Helix as an all-rounder for everything and Brax as a luxury brand where no effort is spared to deliver the very best. With the two-channel amplifier known simply as the RX2 PRO - or by its full name Brax Revelation RX2 PRO Founders Edition – Brax is now breaking completely new ground. While it has been an absolute necessity so far to only release analog Class AB amplifiers under the Brax name, the RX2 PRO works digitally according to the Class D principle and is comparatively small and compact. For the first time, there is a Founders Edition of 888 units, anodized in "Midnight Blue". The regular price in silver or black is 3920 euros with analog inputs and 4000 euros with the digital input module;

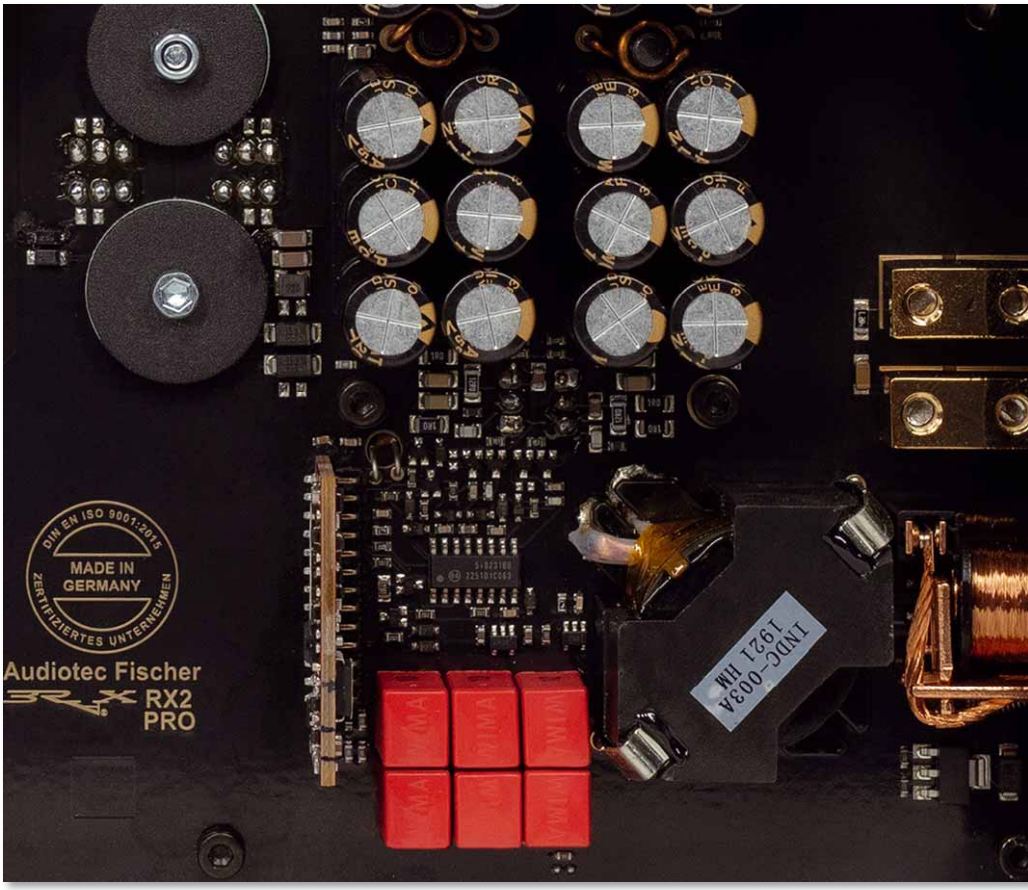


The left half contains the power supply, buffering and, in the middle, the Brax-typical storage chokes, here in SMD version. At the top left, you can see the air scoop of the fan that blows under the board. The Purifi Eigentakt components with the low-pass filter made of red capacitors and a large coil are easy to see. Next to the speaker outputs are the high-end relays, which have their own control circuit. On the right in the middle is the analog input module

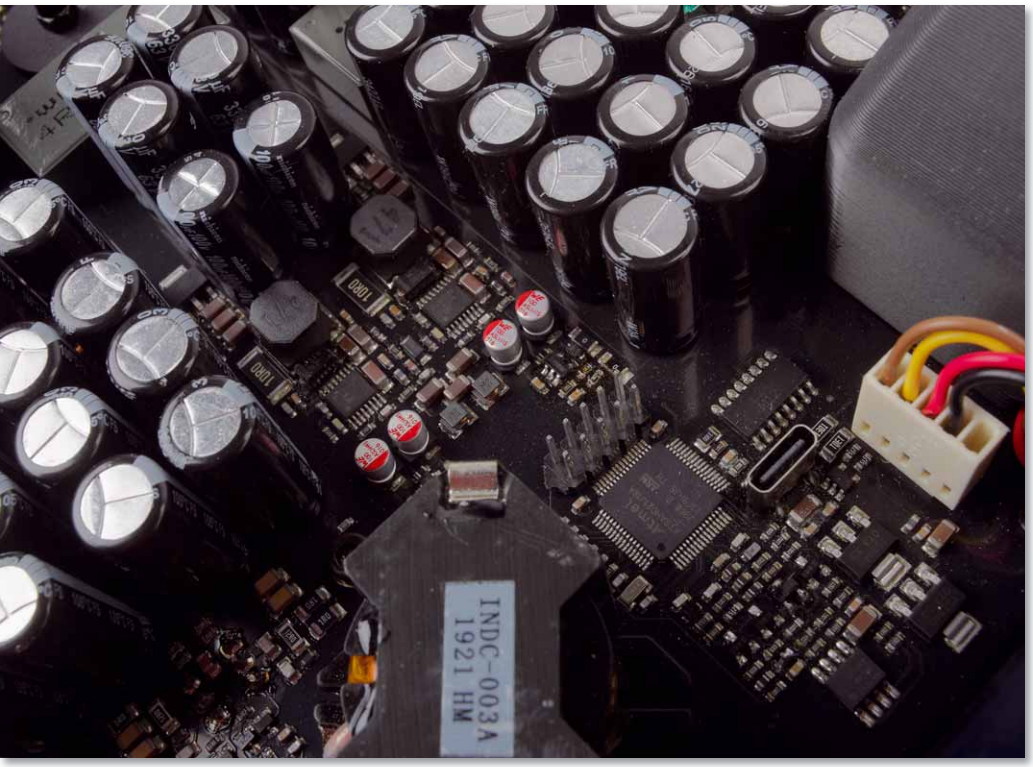


The input module is located in the middle, in our case the analog version with RCA sockets

for the Founders Edition, 500 euros extra need to be spent in each case. The analog input module we used in the test comes with a ground lift switch and, as a special feature, two particularly low-distortion Burr Brown OPA1612s work "against each other" as differential amplifiers, in which interference is canceled out, which is not a disadvantage in a car. The digital option is the first one in the car audio sector to feature a digital-to-analog converter from ESS, which was previously not available in automotive specifications. This wonder weapon aims to impress with measurements that have never been seen before in car audio. The DAC's power supply is also remarkable, with a dual voltage regulator developed by ESS being used. The capabilities of the digital module and the entire RX2 PRO can be optimally explored with the Brax DSP as the RX2 PRO's play partner;



Characteristic circuit with buffer capacitors, daughter board, driver chip and low-pass filter



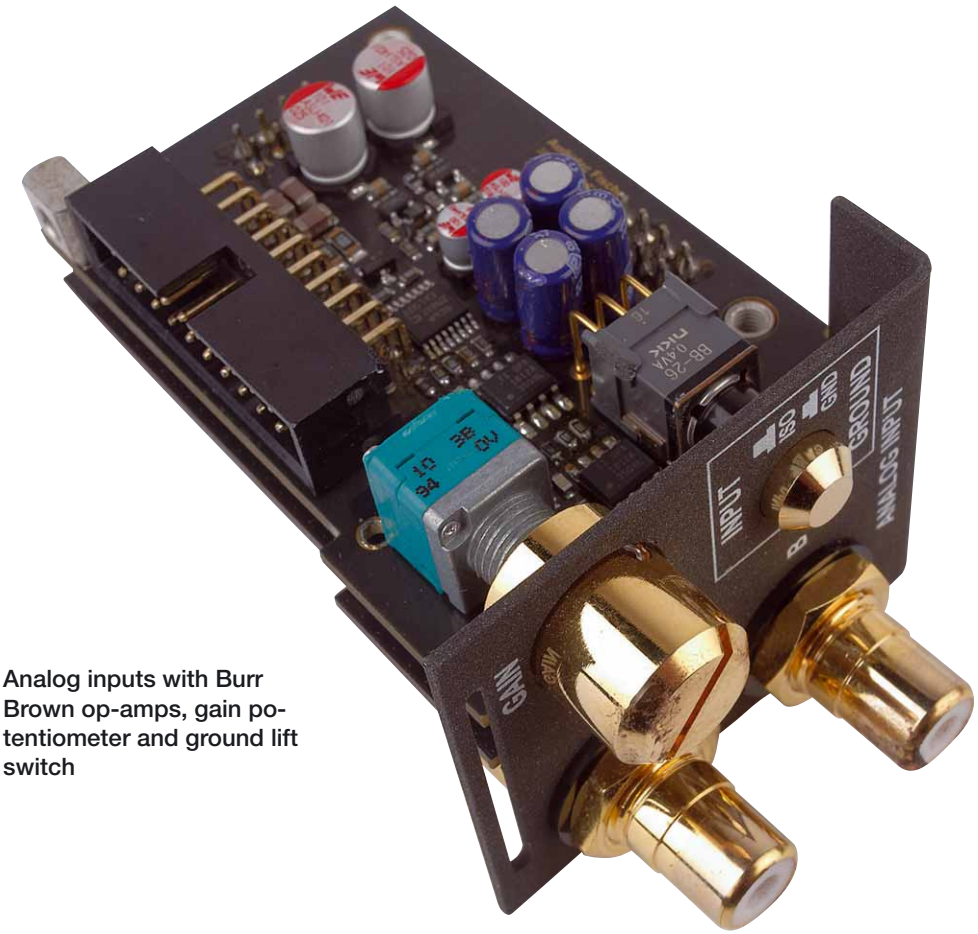
A 32-bit ARM microcontroller monitors the power supply and numerous control functions

incidentally, the power amplifier housing has the same form factor. The digital signal transmission of the two is always optimal thanks to the in-house DiSAC (Digital Signal Analog Controlled) volume control. This is because the bit depth of the signal is not reduced to make it quieter, which leads to a loss of sound quality, but volume information is encoded into the digital music signal and transmitted digitally. In the digital input module, the whole thing is decoded again and the ESS DAC is started with optimal control. The power supply of the RX2 PRO is hidden under a chrome cover and comes from the renowned manufacturer Vakuumschmelze, where special and complex core materials for the transformer are used; this has also been common practice at



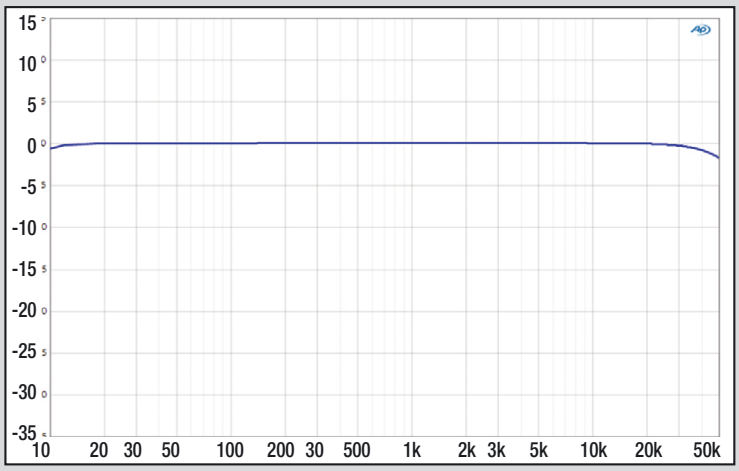
The digital input module offers an optical and a coaxial input, DiSAC volume control is supported

Brax so far. A new feature is the extensive control, which guarantees safe operation with a rock-solid power supply from 6 volts in start-stop vehicles to 18 volts in full-electric vehicles. In addition to many other control and monitoring functions (e.g. short circuit, speaker diagnosis, ground fault, DC components, etc.), an Atmel ARM processor is responsible for this, as can also be found in DSP products from Audiotec Fischer (ACO platform). On a side note, the power supply has also become more efficient than anything comparable, which is always of the utmost importance for the future. All power components are installed under the main board on the heat sink and are cooled as needed by a fan that blows air from outside directly under the board. Of course, the whole thing is regulated and infinitely variable – so what is the controller for? The actual amplification is a novelty not only in the automotive sector but also for Brax. Here, the engineers at Audiotec Fischer draw on a patented Class D design from the Danish development company Purifi. The Class D principle, which has been highly praised in home hi-fi circles, manifests itself in the form of a "self-clocking" circuit that works extremely broadband with high clocking, independently of the load and with low distortion. Once again, error prevention leads to a better product being developed, but before self-clocking could work in the RX2 PRO, the Brax developers had a huge amount of work ahead of them. Because it is not as simple as just bolting the finished home hi-fi module to a car hi-fi power amplifier and everything will run perfectly. It starts with the operating range of the circuit, which was only suf-

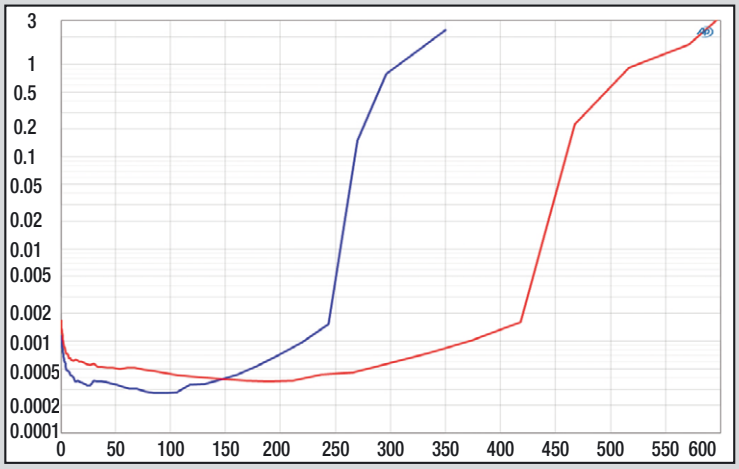


Analog inputs with Burr Brown op-amps, gain potentiometer and ground lift switch

CAR&HIFI Laboratory



The RX2 PRO makes the famous dash, and without overshoot, thanks to the Class D low-pass filter



The Brax works perfectly even at very low power levels and remains so up to 300 or 500 watts. There is one more zero in the diagram than usual, so THD+N goes down to below 0.0003 % – a new record



Brax-typical power connections with extra access for a buffer capacitor

ficient for up to 70° Celsius, which is unacceptable for automotive applications. Not 100% short-circuit proof? Unacceptable. Lacking perfect electromagnetic compatibility? Unacceptable. Minimal noise when switching on and off? Unacceptable, at least for a Brax. In the end, so much new and additional development work was required that it was also a new development project for the Purifi engineers. Just one example is the numerous control loops; even the Brax-typical output relays were given their own control, as were the output filters. Overall, this joint development project led to a new version being developed, with its own special hardware and firmware. The typical Purifi components such as the six red capacitors, the thick low-pass coil, the upright circuit board with the controller (which also features an OPA1612, by the way) and the gate driver chip can be found on the RX2 PRO circuit board. What you cannot see is the three years of development work that went into this amplifier before you could confidently write Brax on this amplifier. Incidentally, the main board itself is eight-layered, which is probably a record for a two-channel output stage. This was necessary not only because of the high-power density in terms of cross-section and efficiency, but also because the ultra-fast and sensitive control loops require the best shielding, and the extreme measurement values that Purifi is proud of can only be achieved if the compensation circuits function perfectly.

Measurements and sound

The proprietary clock circuit is well known, but what the RX2 PRO delivers here is unparalleled in the automotive sector. Due to the tight negative feedback, the internal resistance of the amplification drops to zero, with correspondingly high damping factors, for which three decimal places are no longer sufficient. In some areas, the Brax exceeds the limits of our already impressive Audio Precision measuring station, which is why we had comparative measurements with AP's top model. Results such as the damping that does not go too high in the frequencies or the lack of overshoot in the frequency response, which is otherwise typical for Class D, prove the compensation of the low-pass filter effects in the RX2 PRO. Sensationally low noise is a given, and when measuring power,

we had to add a zero after the decimal point in the diagram because the RX2 PRO delivers a whole order of magnitude better values than a normal power amplifier. In fact, the RX2 PRO is the best power amplifier we have ever tested. The fact that it delivers 300 and 500 watts at 4 and 2 ohms is nice, but even more impressive is that the ultra-low distortion from less than one watt to maximum power is consistently low and is the same at 2 or 4 ohms.

In the listening test, the excitement reached new heights when the RX2 PRO was allowed to show what the result of all the effort was. Rarely have we heard an amplifier that performs with such clarity and tidiness. The soundstage is crystal clear in front of the listener, and there is so much air between the musical performers that everything else suddenly sounds flat and canned. Perhaps the most impressive thing about the RX2 PRO's performance is the way it demonstrates its dynamic capabilities when played back through excellent recordings. From the blackest silence to the sound turbulences, this power amp seems to have endless reserves. But easy listening is also great fun, with the music flowing effortlessly and lightly into the listening room. Vocal reproduction is simply satisfying, and the balance from the lowest bass to the highest treble is just right. This is an extraordinary performance that opens your eyes and ears.

Conclusion

With the Revelation RX2 PRO, Brax delivers nothing less than a masterpiece of amplifier design. This is what high-end audio should be: no frills, no voodoo, just pure engineering.

Elmar Michels



Specifications

Channels	2
Channel power 4 ohms W	306
Channel power 2 ohms W	524
Channel power 1 ohms W	0
Bridged power 2 ohms W	1048
Bridged power 1 ohms W	0
Sensitivity max. mV	1000
Sensitivity min. V	7,8
THD+N (<22 kHz) 5 W	0,001
THD+N (<22 kHz) half power	0,000
Signal-to-noise ratio dB(A)	108
Damping factor 20 Hz	13208
Damping factor 80 Hz	12416
Damping factor 400 Hz	12355
Damping factor 1 kHz	12560
Damping factor 8 kHz	–
Damping factor 16 kHz	–

Features

Low pass	–
High pass	–
Band pass	–
Bass boost	–
Subsonic filter	–
Phase shift	–
High-level inputs	–
Auto turn-on	–
Cinchausgänge	–
Start/stop capable	• (6 V)
Dimensions (L x W x H in mm)	310 x 200 x 56
Others	Analog or digital input

Brax RX2 PRO

Price	um 3,920/4,420 (F.E.) Euro
Contact	Audiotec Fischer, Germany
Internet www.	audiotec-fischer.com

Rating

Sound	40 %	★★★★★
Bass	8 %	★★★★★
Neutrality	8 %	★★★★★
Transparency	8 %	★★★★★
Spatial imaging	8 %	★★★★★
Dynamics	8 %	★★★★★
Lab	35 %	★★★★★
Power	20 %	★★★★★
Damping factor	5 %	★★★★★
Signal-to-noise ratio	5 %	★★★★★
Noise	5 %	★★★★★
Practice	25 %	★★★★½
Features	15 %	★★★★☆
Build quality electronics	5 %	★★★★★
Build quality mechanics	5 %	★★★★★

Absolute Top Class

★★★★★

CAR&HiFi INTERNATIONAL Germany 3/24

Price/performance: very good

"Superlative in every respect – a masterpiece."