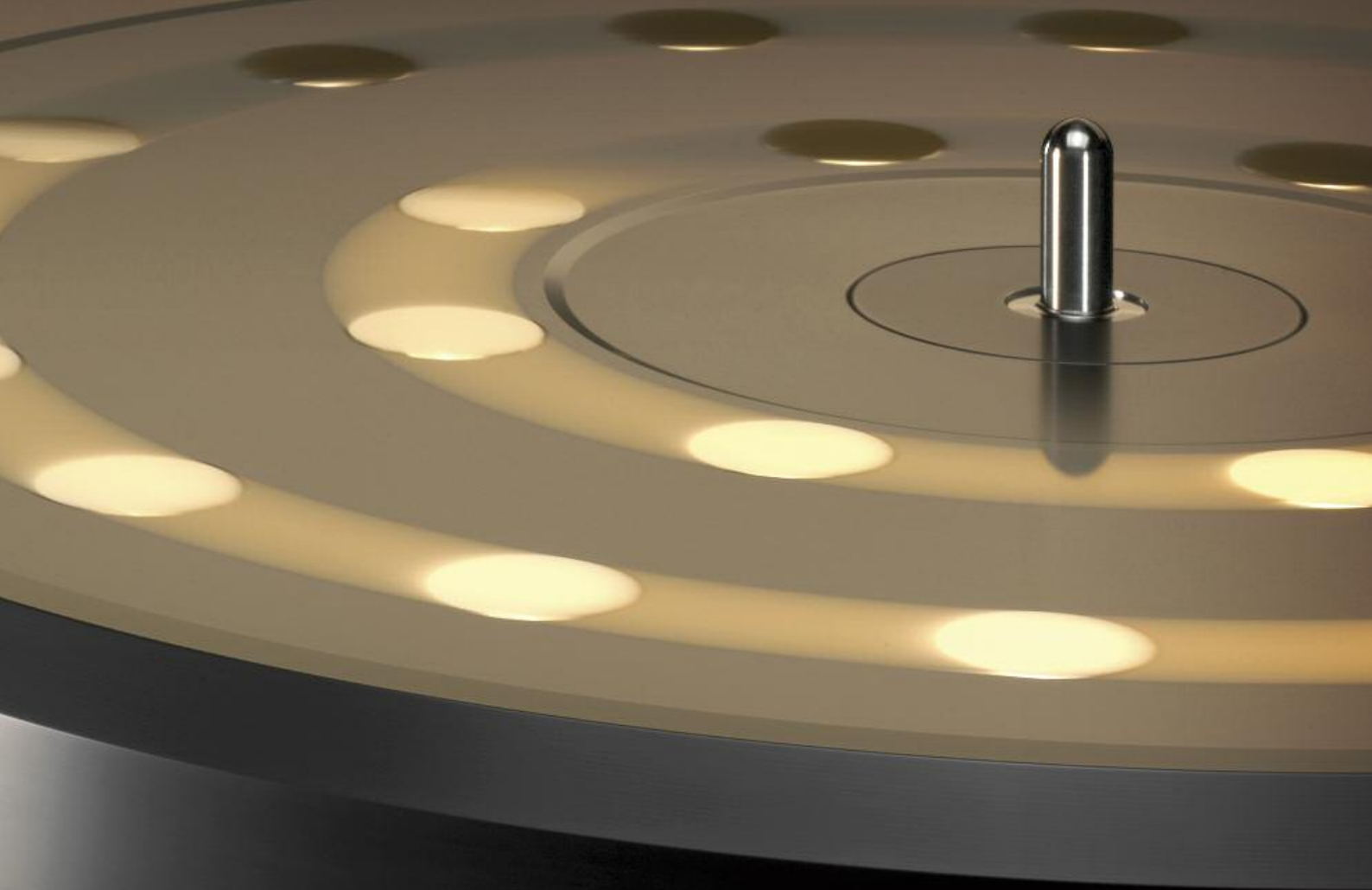


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## Turntable Acoustic Signature Montana NEO with tonearm TA-7000 NEO

Author: Amré Ibrahim Photography: Rolf Winter

**The turntable and tonearm duo from the Süßen-based analogue manufacturer Acoustic Signature outplayed every vinyl replay setup that has ever been played in my listening room. And believe me, that is a whole lot of turntables. Time for a few clear announcements...**

### World class! Full stop

If you are involved in high-quality music reproduction, you cannot fail to notice that the development of digital components is progressing in leaps and bounds. Naturally, I am also intensely dedicated to digital technology and its advantages. As a result, CanEVER's fantastic ZeroUno SE digital-to-analogue converter has recently found its way into my listening room. Nevertheless, I don't know anyone who wouldn't have immediately acknowledged the sonic superiority of my analogue setup – provided the recording quality of the medium is adequate. And as fast as digitalisation is advancing, the analogue world is not standing still. Business with "black gold" has been booming for years: records are once again playing an important role in the official sales charts of the music industry – even the pop music fraternity, whose domain since the 1980s has been the compact disc, is now increasingly relying on vinyl releases. The resurgence of the vinyl record, in turn, has ensured that the market for turntables, tonearms, cartridges and various accessories is also experiencing a boom. The choice is as large as in pre-digital times – in all price ranges and for every taste. If you then enter the realms of the (self-) designated analogue fans, you meet a community that feels committed to a vintage philosophy and swears by the allegedly better sonic performance of discontinued friction wheels or direct-drive players from manufacturers such as Garrard, Technics, EMT, Lenco, Thorens, Commonwealth et cetera. I, too, have my own history in this regard: from Technics and EMT studio turntables to an elaborately restored and modified Garrard 301 – all equipped with the most diverse tonearms – various turntable legends adorned the top level of my rack. Of course, such turntables have their very own charm. It is not without nostalgia that I think back to my cream-coloured Garrard 301, which I had equipped with a Vinylista frame and 12" tone arms by Thomas Schick and Michael Wiedemann. It not only looked very stylish, but also played very, very well.

Nevertheless, such a vintage approach raises fundamental questions for me. For example, many modern turntables have significantly better measured values in terms of rumble and synchronisation fluctuations than many a friction wheel or direct drive





classic. Nonetheless, many analogue enthusiasts attest such turntables more "musicality" and dynamics. Irrespective of the fact that the sound quality of a phono system depends on many different factors, I can't see why poorer measurement data should be reflected in greater "musicality". Personally, I believe that the love of vintage flair plays a much bigger role here than many would like to admit. Of course, some belt-driven high mass turntables still sound "lame" compared to a Technics SP-10 Mk3 or a 12D3 from Commonwealth Electronics. However, manufacturers such as TW Acoustic, TechDAS, Genuin Audio or Acoustic Signature prove that high mass turntables can also exude real dynamics. Of course, I know that some people will wail and protest. But this does not change the fact that the current turntables from the abovementioned manufacturers are more than a match for the dynamic capabilities of an – admittedly beautiful – magnetically mounted Platine Verdier. In view of the astronomical prices that are now being charged for new-

old-stock machines, I see no reason at all, apart from the nostalgic aspect, not to take a closer look at modern turntables – especially when they come up with technical innovations that truly elevate the sound, as in the case of the combination of the Montana NEO high mass turntable and the TA-7000 NEO tonearm from Acoustic Signature.

The company, located in Süßen in the Göppingen district of Baden-Württemberg, has been manufacturing record players for 26 years now. 21 employees work under the management of Gunther and Jacqueline Frohnhöfer. During a visit to the factory last year, I was able to see for myself the impressive vertical integration and the ultra-modern production facilities in the Swabian factory. The newly designed Acoustic-Signature.de homepage – from which many other website operators could learn – does not exaggerate in the "About us" section: chief developer Gunther Frohnhöfer does indeed own a true state-of-the-art machine and computer arsenal: you will find only the very best CNC techno-






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logy and CAD systems here. Purchases are only made from suppliers from the region or the rest of Germany – "Made in Germany" is written in capital letters here. To ensure that the raw materials and components purchased are of a consistently high quality, Gunther Frohnhöfer is prepared to dig deep into his pockets. But this alone is not enough for him: with regard to deviations in production, the principle of "zero tolerance" applies; internal quality control sets the highest standards. The result is evident in the test units I have: haptics, value, finish – I don't think I'm exaggerating when I say that all this is on a level that is probably unparalleled anywhere in the world. I could walk around the Montana NEO with its black, finely anodised surface and the 24 silencer modules made of brass that are precisely embedded in the turntable for hours and just marvel at its external appearance alone – which is pleasingly compact at 43 centimetres wide and deep and 17 centimetres high.

The production expenditure is immense: all parts of the chassis and the platter – both are made of a soft aluminium alloy – are CNC-milled and then sanded and brushed several times by hand. The mirror polished silencers, which together with the bitumen layer on the underside of the platter serve for damping, and which are a real Acoustic Signature trademark, are pressed into the platter by hand. The number, arrangement and construction of these are not influenced by visual considerations, but solely serve the goal of minimising undesired vibrations in a targeted way – which undoubtedly

The Montana NEO's 24-kilogram chassis, made of a soft aluminium alloy, has three feet and houses the bearing for the sub-disk and three AC synchronous motors, which are controlled by the new, fully digital DMC-20 motor electronics in the external housing. To bring the turntable into balance, the aluminium feet, filled with a damping gel, can be finely adjusted in height. The three-point set-up reduces the contact area between chassis and platform to a minimum

succeeds: the famous knock test on the turntable ends in an acoustic "stillbirth", so to speak. According to Gunther Frohnhöfer, the use of just eight silencers already leads to a reduction of resonance peaks by about 80 decibels from 2.5 kilohertz. The successor to Acoustic Signature's self-lubricating Tidorfolon platter bearing, which has already made waves among experts due to its extremely low noise level, robustness and maintenance-free design, is the so-called "Dura Turn Diamond Bearing" (DTD). According to Frohnhöfer, it is characterised by a 60 percent lower coefficient of friction. To achieve this, the DTD bearing uses vacuum-hardened, ground stainless steel of material grade 1.4571, which is subjected to a complex, expensive plasma coating. The extremely hard stainless steel mandrel is guided laterally by artificially aged, rolled and split sintered bronze sleeves seated in the bearing bush. As a result of the sintering process, in which the bronze is atomised and then compressed, the sleeves have sponge-like pores inside, which increases their absorption capacity threefold for the lubricating oil with which they are filled under heat in a vacuum. For the DTD bearing, which is adapted to the specific disc weight of the drive, Frohnhöfer continues to use a ball bearing made of tungsten carbide. The trained communications engineer doesn't think much of conventional bearing designs: conventional bearings would simply "push away" the lubricating oil under the heavy weight of the platter in view of the very small spherical surface. Inverted bearings, on the other hand, are nothing more than a marketing trick: "By inverting them, you merely bring the noise that is generated at the pivot point of the platter axle and bearing mirror closer to the platter surface and thus into the direct vicinity of the sensitive pickup. In addition, gravity ensures that the oil runs away from the contact surface." Sounds plausible. The confidence in the new DTD bearing is so great that Acoustic Signature gives it and the entire turntable a 15-year warranty. Do you know of any other turntable manufacturer that offers this? If so, please let me know.



Above: The successor to the famous Tidorfolon platter bearing: To produce the new "Dura Turn Diamond Bearing" (DTD), which is also self-lubricating, vacuum-hardened stainless steel is ground with high precision and then subjected to an elaborate plasma coating. According to Gunther Frohnhöfer, the extremely stable and hard bearing axle offers a 60 percent reduction in the coefficient of friction compared to the predecessor design, which itself already shone with record-breaking values. The newly developed sintered bushings have a threefold increase in capacity for absorbing lubricating oil. Confidence in the DTD bearing is high: Acoustic Signature offers a 15-year warranty!

Bottom left: Constructive attention to detail: The sub-platter is driven by three synchronous motors specially made for Acoustic Signature, arranged at a 120-degree angle to avoid lateral pulling forces on the bearing

Bottom right: The running smoothness cannot be impaired by the extremely precisely ground square rubber double belts, because they do not have any surface irregularities – not every manufacturer manages that. Since the belts can lose their original shape over time due to mechanical stress, changes in room temperature and the effects of humidity and UV light, Acoustic Signature offers a warranty extension when the turntable is registered, which also includes the free replacement of the drive belts every three years – including free delivery. This is how you define customer-oriented service in Süßen!





Let's move on to the Montana NEO's drive: the 24-kilogram chassis, which can accommodate two tonearms from 9 to 12 inches, has three finely height-adjustable feet filled with a special damping gel and fitted with spikes in the centre of its underside. Its three AC synchronous motors, made especially for Acoustic Signature, are arranged at a 120-degree angle so that they cannot exert any lateral pull on the bearing. Three pulleys and perfectly finished square double belts drive the sub-platter, which in turn rotates the 13-kilogram platter. The whole thing is controlled by the external, fully digital DMC-20 motor electronics, which are connected to the motors via two Ethernet cables: By means of an "automatic vibration control" ("AVC") developed by Acoustic Signature, the distortions caused by the motors are measured in real time and – with a time delay that is imperceptible to the listener – largely eliminated by adjusting the phase shifts to the motor signals. Gunther Frohnhöfer told me that the first two Corona lockdowns had been used to further refine the "Constraint Layer Damping" (CLD) process, also developed in-house, in which vibration-minimising compounds and the appropriate choice of materials play a key role, and to adapt the AVC technology and the DTD bearing, which had already been intensively developed, to the new generation of Acoustic Signature turntables down to the last detail. Instead of twelve, the model range now comprises nine turntables, which were summed up in terms of design in collaboration with the renowned industrial designer Burkhard Schlee. In contrast to previously, the development of the NEO series did not stop at the measurement results and employees' listening sessions: Professional musicians and sound engineers were also consulted to act as "acoustic supervisors". After all, at the end of the day, the concentrated use of technology was supposed to provide the listener with top-class sound quality. I'll tell you below how outstandingly the guys from Süßen succeeded in doing this. First, I would like to talk about the TA-7000 NEO used in the test – a 12-inch tonearm that is also available in

a 9-inch version. In terms of feel, this is in no way inferior to the Montana NEO and, in its black version, also matches the turntable perfectly. The TA-7000 NEO can be adjusted quickly and easily using the supplied adjustment template, which is also due to its outstanding quality of workmanship in terms of precision mechanics. The conically shaped, and according to the manufacturer particularly low-resonance tonearm tube made of braided carbon features an internal construction that is probably unique in tonearm design: Its so-called "3-D dam-

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## Partnering equipment

**Turntable:** Pear Audio Blue Odar **Tonearms:** Pear Audio Blue Cornet 2 12", ViV Laboratory Rigid Float Mk2 7" **Headshells:** Acoustical Systems Arché 5D, SteinMusic Ametrin 1, Oyaide HS-TF Carbon **Cartridges:** Lyra Kleos, Ortofon Windfeld Ti, Koetsu Rosewood Signature **Phono stages:** Allnic Audio H-5500, Rike Audio Natalija Pre 2 **MC transformer:** Phasemation T-300 **CD transport:** Sony CDP-X5000 (Clockwork Audio modification) **D/A converter:** CanEVER Zero LE **Integrated amplifier:** Kondo Audio Note Overture PM-2 i **Loudspeaker:** Martion Bullfrog **Cables:** NF and LF cables Schnerzinger Essential, NF cable Kondo Audio Note KSL-VcII, LS cable Kondo Audio Note Opera SPc 2.5, power cable Kondo Audio Note ACc Persimmon, LF and LS8 cable Biophotone, LF cable Acoustic System Liveline, LF cable fastaudio Black Science, digital cable Tiglon MGL-D1R (S/PDIF) and Clockwork Audio (S/PDIF) **Accessories:** turntable support from Black Forest Audio Däd!Mät! and SteinMusic Pi Perfect Interface, Schnerzinger Operator power strip, Schnerzinger Guard- & Grid Protector, CAD Ground Control, Black Forest Audio SoundPucks & SoundSheets, Audiophil Schumann generator, TAOC racks, SteinMusic Harmonizer and Blue Suns, Acoustic Revive RL-30 Vinyl Record Demagnetizer, Audiodesysteme Gläss Vinyl Cleaner PRO X and Sound Improver, Audio Exklusiv d.C.d. Base and Silentplugs, FPH Acoustical Vibration Dampers, Duende-Criatura Damping Rings, fastaudio Absorbers, Acoustical System Resonators, MFE Power Strip, AMR, Furutech and AHP Fine Fuses, Acoustical Systems SMARTtractor and HELOX Record Clamp, Levin Design Record and Needle Brush, MFE Phase Tester, all tubes from BTB Elektronik

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## Turntable Acoustic Signature Montana NEO with tonearm TA-7000 NEO



Absolute accuracy and frequency stability: To generate the clock signals, the microprocessors of the DMC-20 motor electronics have a quartz oscillator from whose signals a sinusoidal signal is permanently calculated. The motors, designed with two coils and 24 poles, are thus supplied with a sine wave and a signal that is 90 degrees out of phase. The unavoidable manufacturing tolerances of the synchronous motors and the resulting vibrations, which are due to the fact that the coils and poles are not positioned one hundred percent exactly, are ironed out by Acoustic Signature in an almost ingenious way: The so-called "Automatic Vibration Control" measures distortions via sensor and automatically adjusts the phase shifts to the motor signals – all in real time and with a latency that is imperceptible to human ears

ping" is provided by an elaborate component from a 3-D printer, which is inserted lengthwise into the outer tube and is both plugged in and fixed with glue on the inside. This construction increases the stiffness of the tonearm and – as the term "3-D damping" suggests – is intended to provide the best possible vibration absorption. To maximise stiffness and smoothness, as well as to achieve the best possible sensing and guiding characteristics, Acoustic Signature uses a stainless steel tonearm axle and a preloaded, high-precision gimbal bearing – a hybrid of ceramic and steel that was originally designed for use in aerospace technology and meets the manufacturer's zero-tolerance requirement with regard to friction and interference from bearing play. For the internal wiring, the Swabians use very thin 4N silver strands (with a purity level of at



least 99.995 per cent). Of course, an anti-skating control is also on board, as is the ability to adjust azimuth and VTA. However, for such a magnificent turntable, I would have liked to have been able to adjust the height "on the fly". I chose the Windfeld Ti, kindly provided by Armin Kern of the German Ortofon distributor ATR, as my playing partner for the tonearm – a musically extremely sensitive and colourful, spatially very generous and dynamically gripping MC cartridge that I would love to add to my small "pick-up fleet". Right from the first bars of the Prelude of Bach's Cello Suite No. 1 in G major

(BWV 1007) on Yo-Yo Ma's album Six Evolutions – Bach Cello Suites (Sony Classical/Sony Music, 19075854651, EU 2018, 3-LP), which no small number of audiophiles regard as a reference recording, the Acoustic Signature puts a sonic exclamation mark: the recording, which makes do with gratifyingly little reverb, breathes an extreme amount of air – with the blackest background imaginable. Yo-Yo Ma seems to be sitting directly opposite me. A term like "involving" definitely does not do justice to the intimacy and closeness of this sound image. I cannot perceive the slightest hint of "swim-

A fine mechanical masterpiece: the TA-7000 NEO by Acoustic Signature is an excellent partner for the Montana NEO as well as for top-class cartridges. The tonearm, here in the 12" version, can be easily adjusted in terms of azimuth, VTA, tracking force and anti-skating and is equipped with a ceramic-steel hybrid precision ball bearing with its origins in space technology, as well as a stainless steel tonearm axle and internal wiring made of high-purity silver. In its construction, it offers a real unique selling point: the conically shaped carbon outer tube is damped and additionally stiffened on the inside by means of an elaborate construction from a 3D printer. The Wildcat tonearm cable from Audioquest, previously included in the scope of delivery, was replaced in January 2022 by an Equator Achromatic from Atlas, which, according to Gunther Frohnhöfer, ensures an even better overall performance

ming", the cello stands rock solid in space. I even think I can make out the position of the spike with which the instrument touches the floor. Acoustic Signature's turntable and tonearm duo conveys the unusual but intentional "roughness" of Yo-Yo Ma's cello with lots of warmth and even more luminosity. These sonic traits are confirmed in the interplay with the Koetsu Rosewood Signature MC cartridge, whereby the Japanese pickup on the TA-7000 helps the mids to shine a little more, but is not able to present the lower registers quite as precisely as the Danish Windfeld Ti. When Stanley Clarke on *Jazz In The Garden*, the debut album of his trio (Heads Up International/In-Akustik, HULP8155, USA 2009, 2-LP), starts to solo with his semi-acoustic bass in the piece "Sakura Sakura" and then slaps like the devil, the Montana NEO hurls the energy of the slapped strings bouncing back onto the fretboard through the membranes of my Martion Bullfrog with such force that even my former reference turntables, the Garrard 301 with external Loricraft power supply and the Technics SP-10 Mk2, wouldn't be able to resist giving it a round of applause if they could. The soundstage on this album turns out to be generous and – more importantly – believable! Lenny White's drums and Hiromi's piano are convincingly assigned fixed places that are spatially excellently separated from each other. At the same time, the playful communication of these three exceptional musicians flows sonically into an absolutely homogeneous whole. Loud-quiet contrasts are reproduced in terms of both coarse and fine dynamics with a precision that sets the benchmark.

AC/DC's "Problem Child" on the famous album *Dirty Deeds Done Dirt Cheap* (Atlantic, ATL 50 323, D 1976, LP) is presented







by Montana NEO and TA-7000 with perfect timing: it grooves out of every groove and gets the maximum of "dirt" out of Bon Scott's unmistakable vocal colours. It's amazing how such a disc, which is not exactly audiophile beyond all measure, can sound all of a sudden. In any case, this leads me to a new definition of the parameter "low distortion". The duo from Süßen also passes the sub-bass test with flying colours: The brute mixture of electronic sound thunderstorms and organic percussion on Soccer96's Dopamine (Moshi Moshi Records, MOSHILP114RX, D/UK 2021, limited edition 2-LP) can cause real difficulties for some turntable tonearm combinations in terms of low bass. Not so the two Swabians: Even the lowest frequencies are transported cleanly, profoundly as well as springily and not as monosyllabically as I am used to from some studio turntable legends. Authority over the entire bandwidth, transparency, verve – everything is there to let the die-hard analogue lover enter vinyl heaven. The longer I listen to the Montana NEO

Outstanding: The haptic feel of the Montana NEO and the TA-7000 NEO is beyond reproach. The quality of the workmanship of the manufacturer from Süßen is definitely in a league of its own! The construction of the two components is self-explanatory to a certain extent. A detailed, easy-to-understand instruction manual as well as a great adjustment template for the tonearm and a high-quality Allen key set are included in the scope of delivery – which cannot be taken for granted

and the TA-7000, the more I can join our American and Asian colleagues who have declared products from Acoustic Signature's NEO series to be references. It's time we got the message in this country too: This is simply world class! Full stop. □

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## Turntable Acoustic Signature Montana NEO

**Functional principle:** three-part, resonance-optimised high mass turntable with integrated control panel **Chassis:** CNC-machined, 65 mm thick, anodised aluminium alloy; surface of chassis **Platter:** aluminium platter (31 x 5 cm, 13 kg), bitumen coated on the back and with 24 brass silencers **Speeds:** 33 1/3 and 45 rpm **Drive:** square double rubber belts (ground); three AC synchronous motors with plastic pulleys and conical, speed-regulated aluminium sub-disc **Motor control:** external digital motor electronics DMC-20 with microcontroller for sine-wave generator, electronically controlled and mains decoupled **Special features:** CLD technology for optimal resonance behaviour; AVC technology Level 3 (automatic vibration control); three height-adjustable, gel-damped aluminium feet; up to two tonearms (9" to 12") can be mounted (278 euros surcharge for second arm board according to customer's wishes) Included in delivery: operating instructions, Allen key set, platter mat made of cowhide, gloves **Finishes:** Black anodised, silver anodised, bicolour; silencer modules with polished brass, optionally 24-carat gold-plated or with polished chrome (surcharge 1498 euros) **Dimensions (W/H/D):** 43/43/17 cm **Weight:** 37 kg **Warranty:** 15 years (with registration) **Price:** 26 998 euros

## Tonearm Acoustic Signature TA-7000 NEO

**Operating principle:** 12" rotating tonearm with ceramic steel hybrid ball bearing, adjustable VTA and azimuth, and anti-skating device **Material/structure:** conical outer tube of braided carbon with bonded and pinned internal construction for 3-D damping; tonearm axle of stainless steel; preloaded, frictionless, high-precision gimbal ball bearing, counterweight of brass, tonearm internal wiring of 4N silver **Effective mass:** 13.9 g **Overhang:** 13.2 mm **Length:** 358 mm **Effective length:** 309 mm **Mounting distance:** 295.8 mm **Tonearm cable:** 1.5 m Atlas Equator Achromatic made of OCC pure copper with 5-pin DIN plug **Tonearm mount:** Rega or SME possible **Finishes:** Silver, black (surcharge 894 euros), "Full Gold" (surcharge 2302 euros), optional headshell made of solid titanium (surcharge 1815 euros) Included in delivery: operating instructions, mounting template **Weight:** 687 g **Warranty:** 5 years (with registration) **Price:** 13 799 euros

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