The Early Years

When I started Audio-Technica in 1962, our first product introduction was the **AT-1** stereo cartridge. During that summer, the recording equipment & technology magazine, "Record Geijutsu", featured the **AT-1** cartridge in their special edition “All About Stereos”. In the meantime, my brother-in-law introduced me to the head of Columbia Records who placed an order for 100 cartridges, the specifications of which were so stringent that it took us over a month to deliver!

At this time we were working in a single, rented room in Tokyo’s Shinjuku 1-chome district – we’d started out with three employers, but that number had now grown to 20. We all worked late into each night, stopping only to eat dinner at a ramen noodle shop just in front of the premises. We stayed there for two years before the need for more space took us to the third-floor of a building in the Higashi-Okubo district. Then just one year later we’d outgrown these premises and moved once more to our new headquarters at Naruse in the city of Machida.

**Hideo Matsushita** (1919–2013)
Founder

Audio-Technica’s first products from 1962, the **AT-1** and the **AT-3**, which quickly became best sellers in Japan.
Dear Customer,

As president of Audio-Technica Corporation, I am very pleased to present our second Edition of our European catalogue dedicated to our full range of phono cartridges.

When my father, Hideo Matsushita, started the company in 1962, the first product he created was the AT1 phono cartridge. By the mid-70’s, Audio-Technica was the largest manufacturer of phono cartridges in the world with an extensive product line-up, in addition to manufacturing cartridges for no fewer than 40 different global brands.

Since that time audio and entertainment has become highly digital but Audio-Technica has never ceased to innovate - not only through our range of analogue phono cartridges, but also in developing and producing two of the most important elements of the audio chain: microphones and headphones.

These two transducers, along with speakers, are arguably the most important link between any electro acoustic technology and the sound we hear or produce. We design microphones to capture the audio in its original acoustic form and we design headphones to reproduce the audio for you to enjoy.

I welcome people of my generation, born in the 40’s, 50’s and 60’s to rediscover the natural sound that can only come from listening to their vinyl collection; and I welcome younger people born in the 70’s, 80’s and 90’s to buy vinyl, listen to it and compare it to their CDs and MP3s favoured today.

I guarantee that all of you will rediscover, or perhaps discover for the first time, something unique that we can’t write in our technical specifications: a level of emotion that will instantly captivate you.

This is due not only to the nature of analogue technology, but to the purity and the musicality of our cartridges, resulting from the passion of our design engineers benefiting from 50 years of technological heritage and the handcraftsmanship of our dedicated employees.

I would like to thank you personally for your interest in our product line and wish you many thousands of hours of pure listening pleasure from your Audio-Technica cartridge.

Kazuo Matsushita
President
Audio-Technica Corporation
50 YEARS OF CARTRIDGES TECHNOLOGY

60’s

The original company sign and logo from Audio-Technica’s first workshop.

70’s to 90’s

1962

21st century

2001

2012

2013

2015
The ultimate performance potential of any record playing system is defined by the capabilities of its phono cartridge. Tonal balance, response range, clarity on musical peaks, stereo separation and imaging, along with freedom from noise and distortion are all affected at the outset. The selection of this first component is critical to the full enjoyment of the rest of your system. Your choice of cartridge can also strongly affect the life of your records. With vinyl records becoming more and more difficult to replace, it’s an important point to keep in mind when selecting a cartridge or upgrading your system.

Since Audio-Technica has long been recognized as a world leader in phonograph cartridge design and production, we offer a wide range of models designed to match turntable/tone arm requirements, performance levels and budget considerations. This brochure is intended to help make your decision easier by giving you as much information as possible. It will also give you specific “numbers” for all of our cartridges, with additional detailed information on our Audiophile Series. But no matter which model you select, we’re confident you’ll find your Audio-Technica cartridge to be outstanding value in every respect.

Choosing your cartridge format

Audio-Technica cartridges can be:
- P-mount (plug-in),
- half-inch mount (1/2”)
- P-mount cartridges have four terminals at the back that simply plug in to the end of the tone arm. The cartridge is then secured to the tone arm with a single screw.
- Half-inch mount cartridges also have four terminals at the back, but they have larger pins that connect to four individual wires at the end of the tone arm. The cartridge is secured to the tone arm’s headshell with two screws, spaced 1/2” apart.

Cartridges such as AT311EP and AT300P were originally P-mount design, though they can be used as 1/2” cartridges using the supplied half-inch adapter bracket P20020. These are called Universal mount models and are therefore compatible with both P-mount and half-inch mount tone arms.

The specifications (pages 14 - 15 - 24 and 25)

The most important specifications include frequency response, channel separation, channel balance and output level. These “numbers” are an attempt to describe how your cartridge will perform, and how well it will meet your needs. Frequency response is a measure of the range of sounds that the cartridge will reproduce uniformly. This “flatness” of response ensures that no frequencies are given over- or under-emphasis. And uniform response is a hallmark of Audio-Technica Vector Aligned cartridges, with even the least expensive units providing smooth reproduction within their stated ranges.

Channel separation is another key specification. It is the measure of how well one channel “ignores” the other stereo channel, so that you don’t get right-side sound from your left-side speaker. It’s measured in dB, and the higher the number, the separation. Separation is especially important at the higher frequencies, a region where Audio-Technica cartridges are particularly outstanding.

Channel balance is a measure of both production quality and good basic design. Both sides of a stereo cartridge should be equal loudness when equally recorded levels are present.

Output level is important in matching your cartridge to the electronics. Too low a level can result in noise, too high a level can over-drive a preamp into distortion. However, the output levels of all A-T Dual Magnet cartridges will work well with virtually any magnetic phono input.

There are a number of other measurements of phono cartridge performance, but in the final analysis, the most important characteristics to you will probably be how well the cartridge performs audibly, how it interfaces with your other system components, and how carefully it preserves your record library for future use.

Is tracking force important?

Yes, but not to the exclusion of other characteristics. Each cartridge (no matter who makes it) operates best in a particular range of tone arm tracking forces. It is important that this range is within the capabilities of your turntable if optimum performance is to be achieved. Keep in mind also that record wear goes up as pressure on the record surface increases. For a given tracking force, pressure on the groove wall will be highest with a small elliptical tip (say 0.2 x 0.7 mil) and lowest with a larger elliptical tip (say 0.4 x 0.7 mil), or even lower with a MicroLine™ stylus. But always stay within the recommended range. Tracking too light can cause as much (or more) damage as tracking too heavy.

Stress analysis photo shows the effect of a 2-gram tracking force. The elliptical stylus (left) contacts the groove in a concentrated area with high pressure. The MicroLine™ stylus (right) contacts the groove over a larger area, resulting in reduced pressure and less record wear.
Audio-Technica offers two main series of cartridges, moving coil and moving magnet.

Four different diamond stylus shapes: MicroLine™, Line Contact, Elliptical, Shibata and Conical.

Three different stylus constructions: Nude Square Shank, Nude Round Shank and Bonded Round Shank.

**Styli shapes**: MicroLine™, Line Contact, Elliptical, Shibata and Conical.

**The MicroLine™ stylus** almost exactly duplicates the shape of the cutting stylus used to produce the original master disc. This enables it to track portions of the groove other styli cannot reach, resulting in extremely accurate tracking of high frequency passages and ruler-flat frequency response within the audible range. The unique multi-level shape wears more evenly, allowing greatly extended record and stylus life.

**The Line Contact stylus** next to the MicroLine™, offers the optimum tip design for high frequency response with minimum abrasion, providing low distortion and low record wear.

**The Elliptical stylus** has two radii, the front radius being wider than the side radius. This allows the stylus to ride in the center of the groove, like the conical, while the smaller side radius can more accurately track higher frequencies. Elliptical styli are available in two sizes - 0.2 x 0.7 mil\(^{(1)}\) and 0.3 x 0.7 mil - with the first number indicating the side radius. The smaller the side radius, the better the sound quality will be.

**The Conical stylus** is the simplest, least expensive and most widely used stylus. Its spherical tip, which has a typical radius of 0.6 mil, normally touches the center of the record groove walls. The conical design works best in moderate to lower priced, and older, record players with a tone arm imposing higher tracking forces, or tone-arm not featuring cartridge tilt adjustment. Typical radius of conical stylus for 78rpm records is 2.5 mil (page 14), four times bigger than LP record conical styli.

**Stylus shank construction**: Nude or Bonded Styli

Nude styli, shaped from whole diamonds, are more costly than bonded styli, with their diamond tips “bonded” to metal shanks before finishing. But because of their lower mass, nude styli track more accurately. Also, since our nude styli are grain-oriented, with their longest-wearing faces touching the record surface, they last longer.

Stylus shank form factor: Square Shank or Round Shank

Square-shank nude styli cost even more than round shank nude styli to make, but mounting them in laser-cut square holes in the cantilever locks them precisely in correct alignment with record grooves.

---

\(\text{mil} = 0.001\ \text{inch} = 0.0254\ \text{mm} = 25.4\ \mu\text{m}\)

---

**Which cartridge is best? Moving coil or moving magnet?**

Many serious audiophiles prefer moving coil designs, citing clarity and transparency of tone, better defined transients, precise stereo imaging and lower distortion as the reason for their preference. Please note that moving coil cartridges require preamps with special compatible inputs (MC phono inputs). The output level of MC cartridges is between 0.2mV to 0.5mV, therefore MM phono inputs designed for cartridges delivering around from 3mV to 5mV cannot accommodate moving coil cartridges. Moving magnet cartridges are more robust, also their stylus assemblies are field-replaceable.
Limited edition AT-OC9/III LTD titanium body MC cartridge

**Model Number**
AT-OC9/III LTD

<table>
<thead>
<tr>
<th>Type</th>
<th>Dual Moving Coil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Material</td>
<td>Titanium</td>
</tr>
<tr>
<td>Frequency Response</td>
<td>10 to 50,000 Hz</td>
</tr>
<tr>
<td>Channel Separation</td>
<td>30 dB (1 kHz)</td>
</tr>
<tr>
<td>Output Channel Balance</td>
<td>0.5 dB (1 kHz)</td>
</tr>
<tr>
<td>Output</td>
<td>0.4 mV (at 1 kHz, 5 cm/sec)</td>
</tr>
<tr>
<td>Vertical Tracking Angle</td>
<td>23 degrees</td>
</tr>
<tr>
<td>Vertical Tracking Force Range</td>
<td>1.8 to 2.2 g (standard 2.0g)</td>
</tr>
<tr>
<td>Stylus Shape</td>
<td>Line Contact Stylus</td>
</tr>
<tr>
<td>Stylus Size</td>
<td>40 x 7 μm</td>
</tr>
<tr>
<td>Stylus Construction</td>
<td>Nude Square Shank</td>
</tr>
<tr>
<td>Cantilever</td>
<td>0.26 mm Ø solid boron</td>
</tr>
<tr>
<td>Static Compliance</td>
<td>35 x 10 -6 cm/dyne</td>
</tr>
<tr>
<td>Dynamic Compliance</td>
<td>18 x 10 -6 cm/dyne (100 Hz)</td>
</tr>
<tr>
<td>Wire Used for Coil</td>
<td>PCOCC (see note n°3)</td>
</tr>
<tr>
<td>Terminal Pins</td>
<td>PCOCC (see note n°3)</td>
</tr>
<tr>
<td>Recommended Load Impedance</td>
<td>50 + 50Ω (1 kHz)</td>
</tr>
<tr>
<td>DC Resistance</td>
<td>12 kΩ</td>
</tr>
<tr>
<td>Coil Inductance</td>
<td>25 μH (1 kHz)</td>
</tr>
<tr>
<td>Cartridge Weight</td>
<td>10.5 g</td>
</tr>
<tr>
<td>Dimensions</td>
<td>17.3 (H) x 16.8 (W) x 25.7 (L) mm</td>
</tr>
<tr>
<td>Mounting</td>
<td>1/2&quot; centers</td>
</tr>
<tr>
<td>Replacement Stylus</td>
<td>Non-magnetic screw driver; 1 brush; 2 washers; 2 x 12 mm mounting screws; 2 x 18 mm mounting screws; 1 pair of PCOCC Lead Wires (AT6106) (standard AT-OC9/III is delivered with AT6101)</td>
</tr>
<tr>
<td>Accessories Included</td>
<td>Non-magnetic screw driver; 1 brush; 2 washers; 2 x 12 mm mounting screws; 2 x 18 mm mounting screws; 1 pair of PCOCC Lead Wires (AT6106) (standard AT-OC9/III is delivered with AT6101)</td>
</tr>
</tbody>
</table>

**Specifications**

- **Machined pure titanium base**
  The base that supports the magnetic circuit and vibration system is made of precisely machined pure titanium material. This enables it to serve as a solid base to support stable playback capability.

- **Quad hybrid lead wire**
  Quad hybrid lead wires with a balanced blend of gold clad, 7N-OFC, PCOCC, and OFC are used in pursuit of the ideal balance with the main cartridge unit.

- **Special line contact stylus and solid boron cantilever with a 0.26 mm diameter**
  The cartridge features a special line contact stylus with a 40μm x 7μm curvature radius at the stylus tip. This not only ensures that the music signals engraved in the analogue records will be read out completely, but also it gives expression to the highest dynamic compliance of the series. By firmly embedding this line contact stylus in a solid boron cantilever with its 0.26 mm diameter and bonding it in place, the music signals read by the tip of the stylus are transmitted reliably to the power-generating coils.

- **Neodymium magnet and permendur yoke drastically increase the magnetic energy**
  The magnet is a neodymium magnet with a maximum energy product BHmax of 50[kJ/m3] while used as the yoke is a permendur yoke with a high saturation flux density and excellent magnetic materials. Together, they further boost the magnetic field concentrated in the coil gap area.

- **PCOCC used for coils and terminal pins**
  PCOCC does not give rise to crystalline interfacing in the transmission direction so audiophiles can enjoy pure transmissions.

- **VC mold for minimizing unnecessary vibration**
  The VC mold that holds the coils in place is made of a hard synthetic resin which is combined with potassium titanate for increased strength and rigidity.

**Limited Edition Pure titanium version of AT-OC9/III cartridge**

AT-OC9/III LTD was produced in 2012-2013 as the limited edition improved version of AT-OC9/III. This cartridge is no longer in production (Limited Edition). During 2014, this cartridge may still be available from high-end audiophile specialists who purchased this prestigious model for their inventory.

**Note 1**
Vertical tracking angle of 20 degrees is IEC/DIN standard.

**Note 2**
When the stylus is to be replaced, replace the entire cartridge. Take the used cartridge to your Audio-Technica Authorized Service Center. The new cartridge, or any other model which is desired among the line-up of MC cartridges sold by Audio-Technica is available at the stylus replacement price (contact Audio-Technica Authorized Service Center).

**Note 3**
PCOCC = Pure Copper by Ohno Continuous Casting process.

**Note 4**
When head amplifier is connected.

**Limited Edition Moving Coil Cartridge Specification**

- **Model Number**: AT-OC9/III LTD
- **Frequency Response**: 10 to 50,000 Hz
- **Channel Separation**: 30 dB (1 kHz)
- **Output Channel Balance**: 0.5 dB (1 kHz)
- **Output**: 0.4 mV (at 1 kHz, 5 cm/sec)
- **Vertical Tracking Angle**: 23 degrees
- **Vertical Tracking Force Range**: 1.8 to 2.2 g (standard 2.0g)
- **Stylus Shape**: Line Contact Stylus
- **Stylus Size**: 40 x 7 μm
- **Stylus Construction**: Nude Square Shank
- **Cantilever**: 0.26 mm Ø solid boron
- **Static Compliance**: 35 x 10 –6 cm/dyne
- **Dynamic Compliance**: 18 x 10 –6 cm/dyne (100 Hz)
- **Wire Used for Coil**: PCOCC (see note n°3)
- **Terminal Pins**: PCOCC (see note n°3)
- **Recommended Load Impedance**: 50 + 50Ω (1 kHz)
- **DC Resistance**: 12 kΩ
- **Coil Inductance**: 25 μH (1 kHz)
- **Cartridge Weight**: 10.5 g
- **Dimensions**: 17.3 (H) x 16.8 (W) x 25.7 (L) mm
- **Mounting**: 1/2" centers
- **Replacement Stylus**: Non-magnetic screw driver; 1 brush; 2 washers; 2 x 12 mm mounting screws; 2 x 18 mm mounting screws; 1 pair of PCOCC Lead Wires (AT6106) (standard AT-OC9/III is delivered with AT6101)
- **Accessories Included**: Non-magnetic screw driver; 1 brush; 2 washers; 2 x 12 mm mounting screws; 2 x 18 mm mounting screws; 1 pair of PCOCC Lead Wires (AT6106) (standard AT-OC9/III is delivered with AT6101)
AT-OC9 Series cartridges (PC 104-MC 520)

The AT-OC9, launched in 1987, was the original cartridge model from which the AT-OC9ML/II and AT-OC9/III evolved. Over the years, the AT-OC series has undergone a number of model changes and it has continued to be a bestseller for over twenty years. While drawing on the basic design of the AT-OC9ML/II which has been available exclusively in overseas markets and received high critical acclaim, a fresh approach for the AT-OC9/III which caused us to review the stylus tip, cantilever, magnetic circuit parts, damper and other aspects in order to track down and embody the highest sound quality.

AT-OC9/III

Dual moving coil stereo cartridge with line contact stylus

Flagship model embodying the highest sound quality ever in the series

- Special line contact stylus and solid boron cantilever with a 0.26 mm diameter

The cartridge features a special line contact stylus with a 40μm x 7μm curvature radius at the stylus tip. This not only ensures that the music signals engraved in the analogue records will be read out completely but also it gives expression to the highest dynamic compliance of the series. By firmly embedding this line contact stylus in a solid boron cantilever with its 0.26 mm diameter and by bonding it in place, the music signals read by the tip of the stylus are transmitted reliably to the power-generating coils.

- Neodymium magnet and permendur yoke have drastically increased the magnetic energy

The magnet is a neodymium magnet with a maximum energy product BHmax of 50[kJ/m3] while a permendur yoke is used with a high saturation flux density and excellent magnetic materials. Together, they further boost the magnetic field concentrated in the coil gap area.

- PCOCC used for coils and terminal pins

PCOCC does not give rise to crystalline interfacing in the transmission direction so audiophiles can enjoy pure transmissions.

- Dual moving coil with high separation and wide response

Our unique moving coil type cartridge has a basic structure where one cylindrical coil is used for the left channel and another is used for the right channel. This structure by which power is generated independently for the left and right channels physically provides outstanding separation characteristics. The AT-OC9/III adopts a reverse V-shaped formation for the two left and right coils to reduce the vibration mass as seen from the stylus tip and minimize the unnecessary movement of the coils to further diminish the distortion.

- VC mold for minimizing unnecessary vibration

The VC mold that holds the coils in place is made of a hard synthetic resin which is combined with potassium titanate for increased strength and rigidity.

- Rugged body dedicated to achieving a design with increased rigidity

Using a precision-crafted sturdy aluminium alloy as the base, the body’s structure is made of hard resin keep parasitic resonance down to a minimum. This minimizes undesirable vibration while the bottom of the body is plated to achieve greater rigidity and an improved signal-to-noise ratio.

AT-OC9ML/II

Dual moving MicroCoil™ stereo phono cartridge

The AT-OC9ML/II Dual Moving MicroCoil™ cartridge is a significant achievement in precision manufacturing, with tolerances held to mere thousandths of an inch. Stringent quality control assures that these tolerances, as well as performance criteria, are maintained by every AT-OC9ML/II cartridge. In addition, the AT-OC9ML/II features:

- Dual-coil system for maximum channel separation.
- High-flux samarium cobalt magnet for improved electrical generation.
- PCOCC coil windings for low-loss “transparent” signal transmission.
- Gold-plated solid boron cantilever.
- MicroLine™ stylus.

AT-OC9ML/II

Dual moving MicroCoil™ stereo phono cartridge

The AT-OC9ML/II Dual Moving MicroCoil™ cartridge is a significant achievement in precision manufacturing, with tolerances held to mere thousandths of an inch. Stringent quality control assures that these tolerances, as well as performance criteria, are maintained by every AT-OC9ML/II cartridge. In addition, the AT-OC9ML/II features:

- Dual-coil system for maximum channel separation.
- High-flux samarium cobalt magnet for improved electrical generation.
- PCOCC coil windings for low-loss “transparent” signal transmission.
- Gold-plated solid boron cantilever.
- MicroLine™ stylus.
Audio-Technica’s flagship magnetic core MC type cartridge with very high quality magnetic circuit.

The AT-ART9 inherits the basic magnetic design from the AT50ANV, which was developed as our 50th anniversary model. Also, it reproduces the highest-quality sound using the vibration system from the AT-OC9/III.

**Neodymium magnet and permendur yoke drastically increase the magnetic energy**

A neodymium magnet is employed with a maximum energy product of 50 kJ/m³ whilst a permendur yoke is used with a high saturation flux density and excellent magnetic materials.

**Hybrid body that reduces unnecessary parasitic resonance**

The housing is made of machined aluminium materials and the cover is made of hard plastic materials. This disperses parasitic resonance and results in clear sound quality.

**Machined aluminium base**

The base that supports the magnetic circuit and vibration system is made of machined aluminium material. This enables it to serve as a solid base to support stable playback capability.

**High-separation, wide-response dual moving coil**

The basic structure is an original MC type, with separate cylindrical coils to the left and right channels. Since power is generated independently in each of the left and right channels, this structure offers truly superior separation. If the signal from the opposite channel escapes, this can cause intermodulation distortion and have a decisive impact on audio quality and how the stereo sound spreads. The structure of this product ensures a clear and smooth sound. Additionally, the two coils have a reverse-V shape which reduces effective moving mass as seen from the stylus tip, limiting unnecessary movement of the coil and further eliminating distortion.

**Special line contact stylus and solid boron cantilever with a 0.26 mm diameter**

The stylus tip is a special line contact type with a 40 μm x 7 μm curvature radius (used in the AT50ANV) and a solid boron cantilever with a 0.26 mm diameter. This allows accurate transfer of music signals read by the stylus tip to the magnetic coil.

**High-sound-quality brass mounting screws**

Two brass mounting screws are provided to attach the cartridge to the shell. They are optimally suited to the high sound quality of the cartridge itself.

**PCOCC coil**

The PCOCC coil enables purer transmission because it does not produce grain boundaries in the direction of the transmission.
Non-magnetic core MC type stereo cartridge (PC 104-MC 520)

### AT-ART7

**Non-magnetic core MC cartridge**

- **Non-magnetic core MC type cartridge based on commemorative model AT50ANV.**
  This product keeps the basic design of non-magnetic core MC type cartridge AT50ANV and changes the coil winding frame from a pure titanium armature to a newly developed liquid crystal polymer armature by an injection molding. This product also succeeds in reducing the weight of the vibration system compared to AT50ANV and provides the extremely natural and clear sound quality with the ability to express three-dimensional sound fields inherent to non-magnetic core types. In addition, this product enables an output voltage of 0.12mV, a relatively high output level for a non-magnetic core system.

- **Liquid crystal polymer armature**
  Liquid crystal polymer used for the coil winding frame not only has an extreme mechanical strength but also a unique property which increases the mechanical strength as the product becomes thinner. Therefore it is a most suitable material for the vibration system of cartridges. This has high intensity and vibration absorption properties, enabling high-quality sound by suppressing unwanted vibration from power generation.

- **Newly designed magnetic circuit that maximizes magnetic energy**
  The magnetic circuit of this product uses a large-sized neodymium magnet with approximately twice the volume of conventional Audio-Technica ferrite core MC types. (Maximum energy product BHmax: 50 [kJ/m^3]) The permendur magnetic circuit parts located around the magnet have also been newly designed to maximize the strength of the intensive magnetic field in the coil gap. This magnetic circuit increases the output voltage, and also enhances playback capability in the medium-to-low-frequency range that is said to be a weak point of conventional non-magnetic core MC types. This provides a very accurate frequency response.

- **Special line contact stylus and solid boron cantilever with a 0.26 mm diameter**
  The stylus tip is a special line contact type with a 40 μm x 7μm curvature radius (used in the AT50ANV) and a solid boron cantilever with a 0.26 mm diameter. This allows accurate transfer of music signals read by the stylus tip to the power generating moving coils.

- **Machined aluminium base**
  The base that supports the magnetic circuit and vibration system is made of machined aluminium material. This enables it to serve as a solid base to support stable playback capability.

- **Hybrid body that reduces unnecessary parasitic resonance**
  The housing is made of machined aluminium materials and the cover is made of hard plastic materials. This disperses parasitic resonance and results in clear sound quality.
AT33sa cartridge  (PC 104-MC 520)

**AT33sa**

Dual moving coil stereo cartridge with Shibata stylus

- **MC cartridge with Shibata stylus**
  The AT33sa is the first Audio-Technica MC cartridge model to feature a Shibata stylus. In addition to its superior high-range performance as a line-contact stylus, the Shibata stylus produces mid and bass sound that is strong and rich. The Shibata stylus is mounted on a boron cantilever with a double damper to greatly improve sound quality.

- **Advanced tapered boron cantilever and reduced weight**
  The AT33sa uses a tapered boron cantilever. Tapering the cantilever and revising the number of coil rotations reduce the weight, giving the cartridge better high range performance and wide range reproduction.

- **Neodymium magnet with dramatically enhanced magnetic energy and permendur yoke**
  The model uses a neodymium magnet with maximum energy product BHmax of 50 [kJ/m3] and a permendur yoke with high saturation flux density and outstanding magnetic properties, which further enhances the concentrated magnetic field of the coil gap.

- **PCOCC coil**
  The PCOCC coil enables purer transmission because it is not subject to grain boundaries in the direction of transmission. *(PCOCC = Pure Copper by Ohno Continuous Casting process (Mono-crystalline high-purity oxygen-free copper))*

- **High-separation, wide response dual moving coil**
  The basic structure is an original MC type, with separate cylindrical coils to the left and right channels. Since power is generated independently in each of the left and right channels, this structure offers truly superior separation. If the signal from the opposite channel escapes, this can cause intermodulation distortion and have a decisive impact on audio quality and how the stereo sound spreads. The structure of this product ensures a clear and smooth sound. Additionally, the two coils have a reverse-V shape which reduces effective moving mass as seen from the stylus tip, limiting unnecessary movement of the coil and further eliminating distortion.

- **VC mold limits unnecessary vibration**
  The VC mold that affixes the coils is made with hard synthetic resin containing potassium titanate to make it highly strong and rigid. This improvement results in a lighter product, which reduces unnecessary vibration.

- **A tough body designed to be rigid**
  The product’s housing is made of precision-cast hard aluminum alloy. Hard synthetic resin sandwiching in the structure on the top and bottom suppresses parasitic resonance. This minimizes unnecessary noise while enhancing rigidity and the signal-to-ratio.
AT33 Series cartridges (PC 104-MC 520)

Common features of AT33EV and AT33PTG/II

- **Neodymium magnet with dramatically enhanced magnetic energy and permendur yoke**
  The model uses a neodymium magnet with maximum energy product BHmax of 50 [kJ/m³] and a permendur yoke with high saturation flux density and outstanding magnetic properties, which further enhances the concentrated magnetic field of the coil gap.

- **PCOCC coil enables purer transmission because it is not subject to grain boundaries in the direction of transmission.**

- **10 Ω middle impedance specifications**
  Loss that occurs as a result of electrical resistance components of a coil is referred to as copper loss. To minimize copper loss, this product has set impedance of 10 Ω. The output voltage of 0.3 mV is easy to use.

- **VC mold limits unnecessary vibration**
  The VC mold that affixes the coils is made with hard synthetic resin containing potassium titanate to make it highly strong and rigid. This improvement results in a lighter product, which reduces unnecessary vibration.

- **A tough body designed to be rigid**
  The product’s housing is made of precision-cast hard aluminium alloy. Hard synthetic resin sandwiching in the structure on the top and bottom suppresses parasitic resonance. This minimizes unnecessary noise while enhancing rigidity and the signal-to-noise ratio.

- **The AT33 series’ traditional double dampers supporting the vibration system have also been renewed and carefully selected to allow rich bass reproduction.**

AT33EV

Dual moving coil stereo cartridge with elliptical stylus

- **Elliptical stylus chip and hard duralumin tapered pipe cantilever**
  The big advantage to the elliptical chip is its ability to richly reproduce sounds in the medium and low ranges. This elliptical chip is embedded into a hard duralumin tapered pipe cantilever. With its outstanding machine strength, the duralumin cantilever is tough enough for the job and produces natural sounds without distortion. The cantilever of this product, moreover, goes through a tapering process to harden it, making it faster to transmit sound than conventional duralumin cantilevers and producing unsurpassed response. Supporting this cantilever fulcrum with the traditional double damper disperses resonance, enables stable tracing and achieves linear frequency characteristics.

- **“Hanenite” vibration-controlling rubber minimizes unnecessary vibration**
  The vibration-controlling rubber “hanenite” is used in the housing interior and the cantilever fulcrum support to minimize unnecessary vibration. The body structure, designed to be rigid and suppress vibration, allows the outstanding basic performance of the dual moving coil to fully express itself.

AT33PTG/II

Dual moving coil cartridge with Micro linear stylus

- **Advanced nude tapered boron and weight reduction**
  This model succeeds in thinning down and shortening the cantilever, compared to the AT33PTG. The coil impedance is also refined from 17Ω to 10Ω. We realized significant weight reduction of the vibration system and successfully improved the basic performance and sound quality of the cartridge.

- **High performance and long-life Micro linear stylus**
  Micro linear (ML) is a specially polished line contact stylus. This has a better high range performance than the conical or elliptical stylus due to its small curvature radius and realizes low distortion and expanding high range reproduction even when playing at the inner circumference of records. And the constancy of the line contact shape is one of its main features with an average product lifetime of around 1,000 hours.
AT-F7 and AT-F2 dual moving coil stereo cartridges

Common features of AT-F7 and AT-F2
The cartridges AT-F7 and AT-F2, with a high-quality sound comparable to more expensive models, provides outstanding value and performance, which delights those who appreciate the sound quality of analogue records.

• Diameter stainless suspension wire
The AT-F7 and AT-F2 uses 0.07 mm diameter stainless suspension wire, which serves an important role as a fulcrum point for audio signal transfer. This stainless wire is used for higher-quality MC-type cartridges. This stabilizes the fulcrum position and enables auditory lateralization to provide excellent expression of the high-frequency range.

• Neodymium magnet for dramatically increased magnetic energy
The neodymium magnet provides maximum energy (BHmax of 50[kJ/m3]), while the pure iron yoke provides excellent properties. Together, they further boast the magnetic field concentrated in the coil gap area.

• PCOCC used for coils and terminal pins
PCOCC does not give rise to crystalline resistance in the transmission direction, enabling audiophiles to enjoy pure transmissions.

• Dual moving coil with high separation and wide response
Our unique moving coil type cartridge has a basic structure where one cylindrical coil is used for the left channel and another is used for the right channel. This structure by which power is generated independently for the left and right channels physically provides outstanding separation characteristics. The leakage of signals from one channel into the other exerts a decisive influence on the stereo expanse as well as on the sound quality. This is because this leakage is tantamount to creating irregular cross modulation. The reason why the dual moving coil system delivers such a clear and finely delineated sound quality is no doubt due to the system’s naturally excellent separation. The AT-F7 and AT-F2 features a reverse V-shaped formation for the two left and right coils to reduce the vibration mass as seen from the stylus tip.

• Durable construction dedicated to achieving increased rigidity
Using a precision-crafted sturdy aluminium alloy as the base, the body’s structure is made of hard resin which minimizes parasitic resonance. This achieves greater rigidity and improves signal-to-noise ratio.

Dual moving coil cartridge AT-F7
• The AT-F7 is equipped with an elliptical stylus (curvature radius: 0.2 x 0.7 mil).
• High-rigidity VC mold combined with potassium titanate minimizes unnecessary vibration
The VC structure that holds the coils in place is made of a hard resin, which is combined with potassium titanate for increased strength and rigidity. The result is less weight and an unprecedented reduction of unnecessary vibration.

Dual moving coil cartridge AT-F2
• The AT-F2 is equipped with an elliptical stylus (curvature radius: 0.3 x 0.7 mil).
## Moving coil true mono cartridges for mono vinyl records

### AT33MONO

**EAN 4961310008346**

High-end moving coil mono cartridge for mono vinyl records

The AT33Mono is made specifically for use on mono LP. The AT33Mono produces sound to a very high quality because it does not easily pick up unnecessary strain components from distorted or scratched records, producing audio that you couldn’t possibly get from a stereo cartridge.

The AT33Mono also has appropriate compliance in the vertical direction, so will not cause damage to stereo records.

- Mono cartridge compatible with stereo playback systems.
- 0.65mil conical nude round shank stylus hard duralumin cantilever.
- Strong body stabilized by a rigid body set-up.
- “Hanenite” anti-vibration high-damping rubber eliminates unnecessary vibrations.
- High-quality sound / brass fastening screw.
- Note: this model is not compatible with SP records due to the size of the diamond (0.6mil) designed for micro-groove 33.3 rpm records.

### AT-MONO3/LP

**EAN 4961310008321**

High output moving coil mono cartridge for mono vinyl LP (Long Play) records

Made specifically for mono recordings on vinyl records, the cartridge only generates signal with horizontal movement. However to produce a minimal wear on the groove, the AT-MONO3/LP also has an adapted vertical compliance.

- Carefully selected components and state of the art technology produce a high resolution cartridge.
- Straight pipe aluminium cantilever and low mass stylus guarantees a high tracking ability.
- The average usage time is 500 hours extending the life span of precious mono recordings.
- High purity PCOCC allows a more transparent signal transmission both high efficiency and high fidelity.
- To support the internal mechanism, the body is made of solid die-cast aluminium alloy, furthermore stiffness is achieved with the addition of rigid synthetic resin to hold the body.
- Note: this model is not compatible with 78rpm SP records due to the size of the diamond (0.6mil) designed for micro-groove 33.3 rpm records.

### AT-MONO3/SP

**EAN 4961310008338**

High output moving coil cartridge for 78rpm (1925-1952 Shellac SP records) **(PC 104-MC S20)**

The AT-MONO3/SP cartridges is designed to faithfully transcribe the performances recorded on 78rpm Shellac records. Made specifically for mono recordings, the cartridge only generates signal with horizontal movement. However to produce a minimal wear on the groove, the AT-MONO3/SP also has an adapted vertical compliance.

- Straight pipe aluminium cantilever and low mass stylus guarantees a high tracking ability.
- The average usage time is 500 hours extending the life span of precious mono recordings.
- High purity PCOCC allows a more transparent signal transmission offering a high efficiency and a high fidelity.
- To support the internal mechanism, the body is made of solid die-cast aluminium alloy, furthermore stiffness is achieved with the addition of rigid synthetic resin to hold the body.
- Note: this model is not compatible with SP records due to the size of the diamond (0.6mil) designed for micro-groove 33.3 rpm records.

### AT33MONO internal wiring

This schematic shows the internal wiring of AT33MONO featuring two horizontal voice coils each voice coil’s termination is available independently per the above diagram.

### AT-MONO3/LP and AT-MONO3/SP internal wiring

This schematic shows the internal wiring of AT-MONO3/LP and AT-MONO3/SP featuring two horizontal voice coils wired in series, resulting electrically as a single mono voice coil. The mono signal is available from white-blue terminals, the same signal is also available from red-green terminals in order to feed both inputs of a stereo phono preamp.
Audiophile moving coil cartridges specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>AT-ART9</th>
<th>AT-ART7</th>
<th>AT-OC9/III</th>
<th>AT-OC9ML/I</th>
<th>AT33sa</th>
<th>AT33EV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Magnetic Core Moving Coil</td>
<td>Non-magnetic Core Moving Coil</td>
<td>Dual Moving Coil</td>
<td>Dual Moving Coil</td>
<td>Dual Moving Coil</td>
<td>Dual Moving Coil</td>
</tr>
<tr>
<td>Body Material</td>
<td>Aluminium</td>
<td>Aluminium</td>
<td>Aluminium</td>
<td>Aluminium</td>
<td>Aluminium/Synthetic Resin</td>
<td>Aluminium/Synthetic Resin</td>
</tr>
<tr>
<td>Frequency Response</td>
<td>15 to 50,000 Hz</td>
<td>15 to 50,000 Hz</td>
<td>15 to 50,000 Hz</td>
<td>15 to 50,000 Hz</td>
<td>15 to 50,000 Hz</td>
<td>15 to 50,000 Hz</td>
</tr>
<tr>
<td>Channel Separation</td>
<td>30 dB (1 kHz)</td>
<td>30 dB (1 kHz)</td>
<td>30 dB (1 kHz)</td>
<td>31 dB (1 kHz)</td>
<td>30 dB (1 kHz)</td>
<td>30 dB (1 kHz)</td>
</tr>
<tr>
<td>Output Channel Balance</td>
<td>0.5 dB (1 kHz)</td>
<td>0.5 dB (1 kHz)</td>
<td>0.5 dB (1 kHz)</td>
<td>1.0 dB (1 kHz)</td>
<td>0.5 dB (1 kHz)</td>
<td>0.5 dB (1 kHz)</td>
</tr>
<tr>
<td>Output</td>
<td>0.5 mV (at 1 kHz, 5 cm/sec)</td>
<td>0.2 mV (at 1 kHz, 5 cm/sec)</td>
<td>0.4 mV (at 1 kHz, 5 cm/sec)</td>
<td>0.4 mV (at 1 kHz, 5 cm/sec)</td>
<td>0.3 mV (at 1 kHz, 5 cm/sec)</td>
<td>0.3 mV (at 1 kHz, 5 cm/sec)</td>
</tr>
<tr>
<td>Vertical Tracking Angle</td>
<td>23 degrees</td>
<td>23 degrees</td>
<td>23 degrees</td>
<td>23 degrees</td>
<td>21 degrees</td>
<td>21 degrees</td>
</tr>
<tr>
<td>Stylus Shape</td>
<td>Special Line Contact Stylus</td>
<td>Special Line Contact Stylus</td>
<td>Line Contact Stylus</td>
<td>Microline™</td>
<td>Shibata</td>
<td>Elliptical Stylus</td>
</tr>
<tr>
<td>Stylus Construction</td>
<td>Nude square shank</td>
<td>Nude square shank</td>
<td>Nude square shank</td>
<td>Nude square shank</td>
<td>Nude square shank</td>
<td>Nude square shank</td>
</tr>
<tr>
<td>Cantilever</td>
<td>0.26 mm solid boron</td>
<td>0.26 mm solid boron</td>
<td>Gold-plated solid boron</td>
<td>Nude tapered boron</td>
<td>Duralumin</td>
<td>Duralumin</td>
</tr>
<tr>
<td>Static Compliance</td>
<td>35 x 10⁻⁶ cm / dyne</td>
<td>35 x 10⁻⁶ cm / dyne</td>
<td>35 x 10⁻⁶ cm / dyne</td>
<td>40 x 10⁻⁶ cm / dyne</td>
<td>40 x 10⁻⁶ cm / dyne</td>
<td>40 x 10⁻⁶ cm / dyne</td>
</tr>
<tr>
<td>Dynamic Compliance</td>
<td>18 x 10⁻⁶ cm / dyne (100 Hz)</td>
<td>18 x 10⁻⁶ cm / dyne (100 Hz)</td>
<td>9 x 10⁻⁶ cm / dyne (100 Hz)</td>
<td>10 x 10⁻⁶ cm / dyne (100 Hz)</td>
<td>10 x 10⁻⁶ cm / dyne (100 Hz)</td>
<td>10 x 10⁻⁶ cm / dyne (100 Hz)</td>
</tr>
<tr>
<td>Wire Used for Coil</td>
<td>PCOCC (see note n°3)</td>
<td>PCOCC (see note n°3)</td>
<td>PCOCC (see note n°3)</td>
<td>PCOCC (see note n°3)</td>
<td>PCOCC (see note n°3)</td>
<td>PCOCC (see note n°3)</td>
</tr>
<tr>
<td>Terminal Pins</td>
<td>Brass</td>
<td>Brass</td>
<td>Brass</td>
<td>Brass</td>
<td>Brass</td>
<td>Brass</td>
</tr>
<tr>
<td>Recommended Load Impedance</td>
<td>Min 100 kΩ</td>
<td>Min 100 kΩ</td>
<td>Min 100 kΩ</td>
<td>Min 100 kΩ</td>
<td>Min 100 kΩ</td>
<td>Min 100 kΩ</td>
</tr>
<tr>
<td>Coil Impedance</td>
<td>12Ω (1 kHz)</td>
<td>12Ω (1 kHz)</td>
<td>12Ω (1 kHz)</td>
<td>12Ω (1 kHz)</td>
<td>12Ω (1 kHz)</td>
<td>12Ω (1 kHz)</td>
</tr>
<tr>
<td>DC Resistance</td>
<td>12Ω</td>
<td>12Ω</td>
<td>12Ω</td>
<td>12Ω</td>
<td>12Ω</td>
<td>12Ω</td>
</tr>
<tr>
<td>Coil Inductance</td>
<td>25 µH (1 kHz)</td>
<td>25 µH (1 kHz)</td>
<td>25 µH (1 kHz)</td>
<td>25 µH (1 kHz)</td>
<td>22 µH (1 kHz)</td>
<td>22 µH (1 kHz)</td>
</tr>
<tr>
<td>Cartridge Weight</td>
<td>8.5 g</td>
<td>8.5 g</td>
<td>8.5 g</td>
<td>8.5 g</td>
<td>8.5 g</td>
<td>8.5 g</td>
</tr>
<tr>
<td>Dimensions</td>
<td>17.3 (H) x 17.0 (W) x 25.6 (L) mm</td>
<td>17.3 (H) x 17.0 (W) x 25.6 (L) mm</td>
<td>17.3 (H) x 17.0 (W) x 25.6 (L) mm</td>
<td>17.3 (H) x 16.8 (W) x 25.7 (L) mm</td>
<td>16.6 (H) x 16.6 (W) x 26.5 (L) mm</td>
<td>16.0 (H) x 16.6 (W) x 26.5 (L) mm</td>
</tr>
<tr>
<td>Mounting</td>
<td>1/2″ centers</td>
<td>1/2″ centers</td>
<td>1/2″ centers</td>
<td>1/2″ centers</td>
<td>1/2″ centers</td>
<td>1/2″ centers</td>
</tr>
<tr>
<td>Stylus Weight</td>
<td>1.6 to 2 g (standard 1.8 g)</td>
<td>1.6 to 2 g (standard 1.8 g)</td>
<td>1.8 to 2.2 g (standard 2.0 g)</td>
<td>1.25 to 1.75 g (standard 1.5 g)</td>
<td>1.8 to 2.2 g (standard 2.0 g)</td>
<td>1.8 to 2.2 g (standard 2.0 g)</td>
</tr>
</tbody>
</table>

1) When the stylus is to be replaced, replace the entire cartridge. Take the used cartridge to your Audio-Technica Authorized Service Center.
2) The new cartridge, or any other model which is desired among the line-up of MC cartridges sold by Audio-Technica, are available at the stylus replacement price (contact an Audio-Technica Authorized Service Center).
3) PCOCC = Pure Copper by Ohno continuous casting process.
4) When head amplifier connected.
5) The abbreviation mil is equal a thousandth of an inch - mil = 0,001 inch = 0,0254 mm = 25,4 µm
### Audiophile mc cartridges specifications

**Model Number** | AT33PTG/II | AT-F7 | AT-F2  
---|---|---|---  
**Type** | Dual Moving Coil | Dual/Moving Coil | Dual/Moving Coil  
**Body Material** | Aluminum/Synthetic Resin | Aluminum/Synthetic Resin | Aluminum/Synthetic Resin  
**Frequency Response** | 15 to 50,000 Hz | 15 to 50,000 Hz | 15 to 30,000 Hz  
**Channel Separation** | 30 dB (1 kHz) | 27 dB (1 kHz) | 25 dB (1 kHz)  
**Output Channel Balance** | 0.5 dB (1 kHz) | 1.5 dB (1 kHz) | 1.5 dB (1 kHz)  
**Output** | 0.3 mV (at 1 kHz, 5 cm/sec) | 0.35 mV (at 1 kHz, 5 cm/sec) | 0.32 mV (at 1 kHz, 5 cm/sec)  
**Vertical Tracking Angle** | 23 degrees | 23 degrees | 23 degrees  
**Vertical Tracking Force Range** | 1.8 to 2.2 g (standard 2.0 g) | 1.8 to 2.2 g (standard 2.0 g) | 1.8 to 2.2 g (standard 2.0 g)  
**Stylus Shape** | MicroLine™ | Elliptical Stylus | Elliptical Stylus  
**Stylus Curvature Radius** | 0.2 x 0.7 mm | 0.3 x 0.7 mm |  
**Stylus Construction** | Nubia square shank | Nubia square shank | Nubia square shank  
**Cantilever** | Gold-plated solidbronze | Aluminum |  
**Dynamic Compliance** | 40 x 10⁻⁶ cm²/dyne | 35 x 10⁻⁶ cm²/dyne | 35 x 10⁻⁶ cm²/dyne  
**Coil Inductance** | 10 x 10⁻⁴ cm²/dyne (100 Hz) | 9 x 10⁻⁴ cm²/dyne (100 Hz) | 9 x 10⁻⁴ cm²/dyne (100 Hz)  
**DC Resistance** | 6.8 g | 6.8 g | 6.9 g  
**Dimensions** | 16.0 (1 kHz, 16.6 (1 kHz) x 28.5 (1 mm) | 17.3 (1 kHz, 16.8 (1 kHz) x 25.4 (1 mm) | 17.3 (1 kHz, 16.8 (1 kHz) x 25.4 (1 mm)  
**Mounting** | 1/2” centers | 1/2” centers | 1/2” centers  
**Replacement Stylus** | (see note n°7) | (see note n°7) | (see note n°7)  
**Accessories Included** | 1 x non-magnetic screwdriver, 1 brush; 2 washers, 2 nuts, 2 13 mm mounting screws; 2 x 13 mm mounting screws; 1 x phosphor bronze; 1 x phosphor bronze | 1 x non-magnetic screwdriver, 1 brush; 2 washers, 2 nuts, 2 13 mm mounting screws; 2 x 13 mm mounting screws; 1 x phosphor bronze; 1 x phosphor bronze | 1 x non-magnetic screwdriver, 1 brush; 2 washers, 2 nuts, 2 13 mm mounting screws; 2 x 13 mm mounting screws; 1 x phosphor bronze; 1 x phosphor bronze  

---

### Cartridges specifications for vintage records: 78 rpm Shellac and mono-vinyl

#### for 78 rpm Shellac Records

**Model Number** | AT-MONO3/SP  
---|---  
**Type** | Horizontal Mono Moving Coil  
**Body Material** | Aluminum/Synthetic Resin  
**Frequency Response** | 22 to 25,000 Hz  
**Output Voltage** | 1.2 mV (at 1 kHz, 12 cm/sec)  
**Vertical Tracking Angle** | 23 degrees  
**Vertical Tracking Force Range** | 3 to 7 g (standard 5 g)  
**Stylus Shape** | Conical  
**Stylus Construction & Size** | 2.5 mm (see note n°), 63.5 µm  
**Cantilever** | Aluminum Pipe  
**Static Compliance** | 10 x 10⁻⁶ cm²/dyne  
**Dyne Compliance** | 3 x 10⁻⁶ cm²/dyne (100 Hz)  
**Wire Used for Coil** | PCOCC (see note n°)  
**Recommended Load Impedance** | 400 Ω to 47,000 Ω (see note n°)  
**Coil Impedance** | 400 Ω (1 kHz)  
**DC Resistance** | 40 Ω  
**Cartridge Weight** | 190 g (1 kHz)  
**Dimensions** | 16.0 (1 kHz) x 16.6 (1 kHz) x 28.5 (1 mm)  
**Mounting** | 1/2” centers |  
**Replacement Stylus** | (see note n°7)  
**Accessories Included** | Non-magnetic screwdriver, 1 brush; 2 washers, 2 nuts, 2 13 mm mounting screws; 2 x 13 mm mounting screws; 1 x phosphor bronze; 1 x phosphor bronze |  

#### for Mono Vinyl (see note n°7)

**Model Number** | AT-MONO3/LP | AT33 MONO  
---|---|---  
**Type** | Horizontal Mono Moving Coil  
**Body Material** | Aluminum/Synthetic Resin  
**Frequency Response** | 22 to 25,000 Hz  
**Output Voltage** | 1.2 mV (at 1 kHz, 5.8 cm/sec)  
**Vertical Tracking Angle** | 23 degrees  
**Vertical Tracking Force Range** | 3 to 7 g (standard 5 g)  
**Stylus Shape** | Conical  
**Stylus Construction & Size** | 0.6 mm (see note n°), 15.2 μm  
**Cantilever** | Aluminum Pipe  
**Static Compliance** | 15 x 10⁻⁶ cm²/dyne  
**Dyne Compliance** | 7 x 10⁻⁶ cm²/dyne (100 Hz)  
**Wire Used for Coil** | PCOCC (see note n°)  
**Recommended Load Impedance** | 400 Ω to 47,000 Ω (see note n°)  
**Coil Impedance** | 400 Ω (1 kHz)  
**DC Resistance** | 40 Ω  
**Cartridge Weight** | 150 g (1 kHz)  
**Dimensions** | 16.0 (1 kHz) x 16.6 (1 kHz) x 25.1 (1 mm)  
**Mounting** | 1/2” centers |  
**Replacement Stylus** | (see note n°7)  
**Accessories Included** | Non-magnetic screwdriver, 1 brush; 2 washers, 2 nuts, 2 13 mm mounting screws; 2 x 13 mm mounting screws; 1 x phosphor bronze; 1 x phosphor bronze |  

---

1) Vertical tracking angle of 20 degrees is IEC/DIN standard.
2) When the stylus is to be replaced, replace the entire cartridge. Take the used cartridge to your Audio-Technica Authorized Service Center.
3) The new cartridge, or any other model which is desired among the line-up of MC cartridges sold by Audio-Technica, is available at the stylus replacement price (contact Audio-Technica Authorized Service Center).
4) PCOCC = Pure Cooper by Ohno continuous casting process.
5) The abbreviation mil is equal a thousandth of an inch - mil = 0.001 inch = 0.0254 mm = 25.4 µm.
6) When headamplifier connected.
7) When headamplifier connected.
8) When headamplifier connected.
9) When headamplifier connected.
10) When headamplifier connected.
11) When headamplifier connected.
12) When headamplifier connected.
13) When headamplifier connected.
Moving coil cartridges replacement styli European program

Due to the technical nature and highly skilled construction involved in moving coil cartridges, it is not possible to replace the stylus. Audio-Technica does not recommend having a moving coil cartridge re-tipped or repaired by any independent, unauthorized repair centre since the original performance and optimal specifications can only be obtained when the complete cartridge is assembled and thoroughly tested by our skilled engineers at Audio-Technica’s specialist production facility in Japan.

Therefore Audio-Technica offers two comprehensive trade-in programs for its customers with moving coil cartridges with worn out styli. Under the first program, customers are able to trade-in their old cartridge for a brand new MC cartridge of the same model (or equivalent or lower priced), and under the second program customers are able to take the opportunity to upgrade to a higher grade model.

Moving coil cartridge trade-in program prices

This program allows Audio-Technica customers to trade-in their old cartridge for a brand new MC cartridge of the same model (or equivalent or lower priced) at a discounted price of **40%** off the Audio-Technica European recommended retail price (at the time of trade-in) when they return their old model to us.

- AT-ART9/RP **ART9** Cartridge replacement program
- AT-ART7/RP **ART7** Cartridge replacement program
- AT-OC9/III/RP **AT-OC9/III** Cartridge replacement program
- AT-OC9ML/II/RP **AT-OC9ML/II** Cartridge replacement program
- AT-33EV/RP **AT-33EV** Cartridge replacement program
- AT-33PTG/II/RP **AT-33PTG/II Cartridge replacement program**
- AT-33sa/RP **AT-33sa Cartridge replacement program**
- AT-F7/RP **AT-F7 Cartridge replacement program**
- AT-F2/RP **AT-F2 Cartridge replacement program**
- AT-MONO3/LP/RP **AT-MONO3/LP Cartridge replacement program**
- AT-MONO3/MONO/RP **AT-MONO3/MONO Cartridge replacement program**
- AT-MONO3/SP/RP **AT-MONO3/SP Cartridge replacement program**

Moving coil cartridge trade-in program prices with model upgrade

This program allows Audio-Technica customers to trade-in their old cartridge for an alternative or higher priced brand new MC cartridge at a discounted price of **30%** off the Audio-Technica European recommended retail price (at the time of trade-in) when they return their old model to us.

- AT-ART9/RPU **ART9** Cartridge replacement program with upgrade
- AT-ART7/RPU **ART7** Cartridge replacement program with upgrade
- AT-OC9/III/RPU **AT-OC9/III** Cartridge replacement program with upgrade
- AT-OC9ML/II/RPU **AT-OC9ML/II** Cartridge replacement program with upgrade
- AT-33EV/RPU **AT-33EV** Cartridge replacement program with upgrade
- AT-33PTG/II/RPU **AT-33PTG/II Cartridge replacement program with upgrade**
- AT-33sa/RPU **AT-33sa Cartridge replacement program with upgrade**
- AT-F7/RPU **AT-F7 Cartridge replacement program with upgrade**
- AT-F2/RPU **AT-F2 Cartridge replacement program with upgrade**
- AT-MONO3/LP/RPU **AT-MONO3/LP Cartridge replacement program with upgrade**
- AT-MONO3/MONO/RPU **AT-MONO3/MONO Cartridge replacement program with upgrade**
- AT-MONO3/SP/RPU **AT-MONO3/SP Cartridge replacement program with upgrade**

Limited edition moving coil cartridge trade-in program

- AT50ANV/RP **AT50ANV** anniversary MC cartridge was a limited edition and case stylus replacement is necessary, the owner of AT50ANV will be able to trade in for model AT-ART7, offering very similar performance. (See AT-ART7 trade-in program prices above.)
- AT-OC9/III LTD **AT-OC9/III LTD** was a limited edition and in case stylus replacement is necessary, the owner of AT-OC9/III LTD will be able to trade in for the model AT-OC9/III, offering very close similar performance. (See AT-OC9/III trade-in program prices above.)

Terms and conditions

The customer must return the old Audio-Technica moving coil cartridge to an Authorized Moving Coil Cartridge Service Centre along with proof of purchase. The MC cartridge returned under the program must be outside of its warranty period, and be in working order (with the exception of a worn stylus) with no mechanical damage. This program is available exclusively for customers in Europe.

(For customers with damaged or broken cartridges, please contact your local Authorized Moving Coil Cartridge Service Centre for assistance)
How does a VM type moving magnet cartridge work?

First, a word about how record grooves are created. Left and right-channel audio signals drive two coils, mounted at 90 degrees to each other, in a cutter head. The combined motion of these two signals causes the cutter stylus to carve out an undulating groove in a master record. Modulations in the groove walls, then, are “analogue” mechanical equivalents of the original audio signals. It’s the cartridge’s job to “read” these modulations and to reconstruct the original stereo signals.

Most cartridges on the market today reconstruct these signals by utilizing a “moving magnet” system. The stylus (or needle) of the cartridge is attached to a tiny arm that can pivot as the stylus is moved by the record groove. A magnet at the other end of the cantilever moves between metal poles that extend from coils of wire, causing an electrical flow that is eventually amplified and heard as sound.

It is no coincidence that our approach to moving magnet cartridges closely duplicates the structure of the record cutting head. Instead of using a single, large magnet, Audio-Technica’s patented Vector-Aligned™ Dual Magnet™ design positions two tiny magnets 90 degree apart – directly in line with the two groove walls – with a separate, independent coil structure for each magnet. This ideal geometry and low magnet mass allow exact translation of record groove motion into matching electrical signals, ensuring excellent channel separation, extended frequency response and superb tracking.

Importance of tension wire construction and material (see illustration above)

Suspension wire (tension wire) has an important role as fulcrum point of the cantilever/stylus/magnets assembly. High quality Audio-Technica MC cartridges use stainless suspension wire, providing a mechanical stabilization optimizing auditory lateralization to provide excellent expression of the high frequency range.

Audio-Technica moving magnet cartridge models AT150MLX, AT440MLb, AT120Eb, AT5V and AT100E VM stereo cartridges feature a unique structure. The structure greatly improves electro-magnetic performances compared with non para-toroidal construction such as in 90 Series cartridges.

Additionally, the models AT150MLX, AT440MLa, AT120E, AT5V and AT100E adopts a lossless para-toroidal generator coil system to their cartridge bodies that results in peak generating efficiency. Stacking two cores makes further improvements to high frequency characteristics by separating the right-and-left channels from the center shield plate, resulting in reduced electrical cross talk.

Para-toroidal coil construction of AT150MLX, AT440MLb, AT120Eb, AT5V and AT100E VM cartridges

With the VM type dual magnet system & high-performance para-toroidal generator coil system, Audio-Technica’s VM stereo cartridges feature a unique structure. The structure greatly improves electro-magnetic performances compared with non para-toroidal construction such as in 90 Series cartridges.

Cartridge models AT440MLa, AT120E, and AT100E and other 90 Series models are designed with a stainless suspension wire featuring unique design and using selected materials. As an example, cartridges such as AT5V, equipped with a conical stylus uses a sophisticated tension wire providing better sonic accuracy and much more controlled response than models such as 90 Series dual moving magnet cartridges.
MicroLine™ VM type dual moving magnet audiophile cartridge

**AT150MLX**

Audiophile moving magnet cartridge with MicroLine™ diamond

- Wide Range Vector-Aligned Vibration System
- Para-toroidal generator coil circuit
- System featuring PCOCC Wire
- MicroLine® shaped diamond tip
- Gold-plated boron cantilever
- Mu-metal shielding plate

**Gold-plated boron cantilever.** Its tiny, gold-plated boron cantilever provides an extremely rigid yet lightweight platform to which the stylus is mounted. Interestingly, the gold plating acts to damp what little resonance the boron may produce.

**MicroLine™ Stylus.** The stylus used is of the latest and most advanced design: the MicroLine™ stylus (Figure 1). More closely resembling the cutter stylus than any previous design, this shape produces better high frequency response with less wear or distortion than with earlier configurations.

**PCOCC Wire.** A technologically advanced pure copper material is used in Audio-Technica’s exclusive “Para-toroidal Signal Generator” (Figure 2). Together with the laminated core structure, which minimizes loss in the high frequency region, this integrated para-toroidal generator system operates at an efficiency significantly greater than conventional cartridges. The use of PCOCC wire (Pure Copper by Ohno Continuous Casting) perfects the performance of the advanced para-toroidal coil design. A special high-temperature extrusion die produces copper with virtually no transverse crystal barriers to impede signal transmission or colour sound. Thus, the coils of the AT150MLX transmit distortion-free sound in which even the most subtle details are reproduced with clarity and purity.

**A mu-metal shielding** plate between the left and right channels in the generator system assure that the high level of channel separation achieved is preserved at the cartridge output. To further increase the accuracy of the AT150MLX’s moving system, Audio-Technica engineers have ensured against unwanted parasitic vibration with an anti-resonance ceramic mounting base.

As a final attention to detail, even the output terminals are constructed of PCOCC copper. This meticulous care and attention given to every minute detail in both the vibration and generator systems has resulted in a significant improvement in the performance and sound quality. This superb cartridge offers audiophiles and other serious listeners added musical enjoyment.
MicroLine™ VM type dual moving magnet premium cartridge (PC 105-MC 520)

AT440MLb
EAN 4961310129651
High-end moving magnet cartridge with MicroLine™ diamond
This AT440MLa cartridge is equipped with Audio-Technica’s patented Dual Magnet cartridge design and delivers “practically identical to the cutter head” performance.
Additional features include a para-toroidal generator coil circuit, a Micro linear stylus, plus other advanced designs for top performance.
MicroLine® shaped diamond tip for better high frequency response with less wear and distortion than elliptical or conventional linear contact styli.
• Dual magnet cartridge design
• Para-toroidal generator coil circuit
• Micro linear stylus
• PCOCC wire
• Gold-plated connectors

Elliptical nude shank dual moving magnet premium cartridge (PC 105-MC 520)

AT120Eb
EAN 4961310129675
Elliptical nude shank VM cartridge para-toroidal
• 0.3 x 0.7 mil nude shank elliptical precision polished diamond
• Para-toroidal coils, long recognized for their high efficiency, are utilized here for the first time in cartridge manufacturing. The result is a series characterized by uniform response and distortion-free performance.
• Gold-plated connectors assure maximum energy transfer.
• Superior imaging and channel separation are achieved through the A-T Vector Aligned Dual Magnet design.
Conical and elliptical bonded round shank stylus VM cartridges

Para-toroidal coils, long recognized for their high efficiency, are utilized here for the first time in cartridge manufacturing. The result is a series characterized by uniform response and distortion-free performance. Gold-plated connectors assure maximum energy transfer. Superior imaging and channel separation are achieved through the A-T Vector Aligned Dual Magnet design.

**AT5V**

VM cartridge with para-toroidal coil and conical stylus
- VM type dual magnet system
- High-performance para-toroidal generator coil system
- Gold plated connectors
- PCOCC coil
- Stainless steel suspension wire improving sound quality and transient response
- Conical polished diamond stylus for less critical tilt angle adjustment allowing more flexible use on various tonearms

AT5V cartridge is equipped with stainless steel suspension wire system of the AT150MLX cartridge and a compliance adjustment screw.

**AT100E**

Elliptical stylus VM cartridge with para-toroidal coil
- VM type dual magnet system
- High-performance para-toroidal generator coil system
- Gold plated connectors
- PCOCC coil
- Molded integrated suspension wire
- Elliptical stylus
Conical and elliptical styli VM **standard coil** AT90 series cartridges (PC 105-MC 520)

The **AT90 Series** represents years of research and development aimed at producing high-performance cartridges at a reasonable price. Features include durable dual magnet design and round diamond stylus, capable of standing up to rigorous commercial use. Excellent channel separation and low distortion add to outstanding tonal quality. **AT90 Series** cartridges can be mounted on virtually any tonearm.

**AT95E/BL**

EAN 4961310016388

**AT95E elliptical stylus MM stereo cartridge**

AT95E cartridge delivered in original Audio-Technica blister pack

- Dual magnet design
- 0.3 x 0.7 mil elliptical stylus
- Alloy tube cantilever

**AT91/BL**

EAN 4961310009885

**AT91 conical stylus MM stereo cartridge**

AT91 cartridge delivered in blister pack

- Conical stylus
- Dual magnet design
- 2.0g tracking force
- Sold in North America as model CN5625AL

**About AT3600L conical stylus budget model cartridge**

AT3600L cartridge

*Exclusively available to turntables manufacturers.*

The AT3600L cartridge is not available from your Audio-Technica Dealer as a separate item. The AT3600L cartridge is supplied as a budget model moving magnet cartridge on several turntables available on the market. For similar applications, our entry model AT91 provides improved performance. AT91 standard tracking force being 2g instead of 3.5g for AT3600L, using AT91 will improve the life of your vinyl records. The AT3600L can be upgraded in order to minimize record wear using replacement stylus ATN91. The upgrade is only possible if your turntable tonearm features tracking force adjustment.
**VM dual MM cartridges**

P-mount and U-mount moving magnet plug-in cartridges (PC 105-MC 520)

This selection of three cartridges allows owners of Technics™, Hitachi™, Pioneer™, and similar linear tracking turntables with T4P plug-in connectors to enjoy the high-fidelity sound that only Audio-Technica can offer. Each is designed specifically for the linear format, while all feature Audio-Technica’s unique dual moving magnet construction. The dual magnet system is combined with the para-toroidal coil construction to assure an excellent sonic clarity and wide channel separation. Special Alnico magnets are employed for a natural and uncoloured sonic performance.

The models AT300P and AT311EP include a universal mounting kit for use with other tonearms.

**Conical stylus P-mount only moving magnet cartridge**

**AT3482P**

Conical stylus

- 0.6 mil conical stylus
- Carbon fiber cantilever
- Installation screw and nut supplied
- Bonded round shank diamond

**AT300P**

Conical stylus P-mount moving magnet cartridges with universal 1/2” adaptor

- 0.6 mil conical stylus
- Alloy tube cantilever
- Universal adaptor, installation screw and nut supplied
- Bonded round shank diamond

AT300P includes P20020 adaptor P-mount to 1/2”

*All trademarks are properties of their respective owners and are hereby acknowledged.*
Elliptical stylus **P-mount** moving magnet cartridges with universal 1/2” adaptor

**AT311EP**

- P-mount MM cartridge, elliptical stylus with universal adaptor
- • 0.3 x 0.7 mil elliptical stylus
- • Alloy tube cantilever
- • Universal adaptor, installation screw and nut supplied
- • Bonded round shank diamond

**P-mounting and U-mounting**

Audio-Technica cartridges are designed with one of three mounting options:

- the **P-mount** (plug-in)
- the **half-inch** mount (1/2”)
- the **universal** mount

• **Half-inch mount cartridge** also has four terminals at the back, but they are larger pins that connect to four individual wires at the end of the tone arm. The cartridge is secured to the tone arm’s headshell with two screws, spaced 1/2” apart.

• **P-mount cartridge** has four terminals at the back that simply plug in to the end of the tone arm. The cartridge is then secured to the tone arm with a single screw.

• **Universal mount model** is a P-mount cartridge with an included half-inch adapter bracket. It is thus compatible with both P-mount and half-inch mount tone arms.

**AT311EP or AT300P** mounted on standard 1/2” headshell using P20020 U-mount adaptor.

**AT311EP, AT300P, AT3482P** mounted on P-mount tonearm (screw and nut are supplied with all models).

Universal Mount (P-mount cartridge with 1/2” adaptor P20020)
### Half-inch mount moving magnet cartridges specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>AT150MLX</th>
<th>AT440MLb</th>
<th>AT120Eb</th>
<th>AT5V</th>
<th>AT100E</th>
<th>AT95E</th>
<th>AT91</th>
<th>AT3600L (various)**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>VM Dual Magnet</td>
<td>VM Dual Magnet</td>
<td>VM Dual Magnet</td>
<td>VM Dual Magnet</td>
<td>VM Dual Magnet</td>
<td>VM Dual Magnet</td>
<td>VM Dual Magnet</td>
<td>VM Dual Magnet</td>
</tr>
<tr>
<td><strong>Frequency Response</strong></td>
<td>10 Hz (at 1 kHz)</td>
<td>20 Hz (25 kHz)</td>
<td>20 Hz (25 kHz)</td>
<td>20 Hz (20 kHz)</td>
<td>20 Hz (20 kHz)</td>
<td>20 Hz (20 kHz)</td>
<td>20 Hz (20 kHz)</td>
<td>20 Hz (20 kHz)</td>
</tr>
<tr>
<td><strong>Channel Separation</strong></td>
<td>30 dB (1 kHz)</td>
<td>28 dB (1 kHz)</td>
<td>28 dB (1 kHz)</td>
<td>24 dB (1 kHz)</td>
<td>24 dB (1 kHz)</td>
<td>18 dB (1 kHz)</td>
<td>18 dB (1 kHz)</td>
<td>20 dB (1 kHz)</td>
</tr>
<tr>
<td><strong>Output Channel Balance</strong></td>
<td>0 dB (at 1 kHz)</td>
<td>0 dB (at 1 kHz)</td>
<td>10 dB (at 1 kHz)</td>
<td>15 dB (at 1 kHz)</td>
<td>15 dB (at 1 kHz)</td>
<td>2.5 dB</td>
<td>2.5 dB</td>
<td>2 dB</td>
</tr>
<tr>
<td><strong>Output Voltage</strong></td>
<td>4.0 mV (at 1 kHz, 5 cm/sec)</td>
<td>4.0 mV (at 1 kHz, 5 cm/sec)</td>
<td>4.0 mV (at 1 kHz, 5 cm/sec)</td>
<td>5.0 mV (at 1 kHz, 5 cm/sec)</td>
<td>4.5 mV (at 1 kHz, 5 cm/sec)</td>
<td>4.0 mV (at 1 kHz, 5 cm/sec)</td>
<td>4.5 mV (at 1 kHz, 5 cm/sec)</td>
<td>3.5 mV (at 1 kHz, 5 cm/sec)</td>
</tr>
<tr>
<td><strong>Vertical Tracking Force Range</strong></td>
<td>23 g</td>
<td>20 g</td>
<td>20 g</td>
<td>18 g</td>
<td>18 g</td>
<td>15 g</td>
<td>15 g</td>
<td>10 g</td>
</tr>
<tr>
<td><strong>Vertical Tracking Angle</strong></td>
<td>20 degrees</td>
<td>20 degrees</td>
<td>20 degrees</td>
<td>20 degrees</td>
<td>20 degrees</td>
<td>20 degrees</td>
<td>20 degrees</td>
<td>20 degrees</td>
</tr>
<tr>
<td><strong>Damping Factor</strong></td>
<td>47,000</td>
<td>47,000</td>
<td>47,000</td>
<td>47,000</td>
<td>47,000</td>
<td>47,000</td>
<td>47,000</td>
<td>47,000</td>
</tr>
<tr>
<td><strong>Stylus Shape</strong></td>
<td>Micro line™</td>
<td>Micro line™</td>
<td>Elliptical</td>
<td>Conical</td>
<td>Elliptical</td>
<td>Elliptical</td>
<td>Conical</td>
<td>Conical</td>
</tr>
<tr>
<td><strong>Stylus Size</strong></td>
<td>Micro linvar™</td>
<td>Micro line</td>
<td>0.3 x 0.7 mil</td>
<td>0.6 mil</td>
<td>0.3 x 0.7 mil</td>
<td>0.6 mil</td>
<td>0.6 mil</td>
<td>0.6 mil</td>
</tr>
<tr>
<td><strong>Stylus Construction</strong></td>
<td>Nudo Sphere Shank</td>
<td>Nudo Sphere Shank</td>
<td>Nudo Sphere Shank</td>
<td>Nudo Sphere Shank</td>
<td>Nudo Sphere Shank</td>
<td>Nudo Sphere Shank</td>
<td>Nudo Sphere Shank</td>
<td>Nudo Sphere Shank</td>
</tr>
<tr>
<td><strong>Cantilever</strong></td>
<td>Gold plated stainless</td>
<td>Aluminum Tapered Pipe</td>
<td>Aluminum Pipe</td>
<td>Aluminum Pipe</td>
<td>Aluminum Pipe</td>
<td>Aluminum Pipe</td>
<td>Carbon Fiber Reinforced ABS</td>
<td>Carbon Fiber Reinforced ABS</td>
</tr>
<tr>
<td><strong>Static Compliance</strong></td>
<td>40 x 10^-6 cm/dyne (10 Hz)</td>
<td>40 x 10^-6 cm/dyne</td>
<td>25 x 10^-6 cm/dyne</td>
<td>35 x 10^-6 cm/dyne</td>
<td>35 x 10^-6 cm/dyne</td>
<td>25 x 10^-6 cm/dyne</td>
<td>25 x 10^-6 cm/dyne</td>
<td>25 x 10^-6 cm/dyne</td>
</tr>
<tr>
<td><strong>Dynamical Compliance</strong></td>
<td>10 x 10^-6 cm/dyne (100 Hz)</td>
<td>10 x 10^-6 cm/dyne (100 Hz)</td>
<td>8 x 10^-6 cm/dyne (100 Hz)</td>
<td>8 x 10^-6 cm/dyne (100 Hz)</td>
<td>6.5 x 10^-6 cm/dyne (100 Hz)</td>
<td>6.5 x 10^-6 cm/dyne (100 Hz)</td>
<td>6.5 x 10^-6 cm/dyne (100 Hz)</td>
<td>6.5 x 10^-6 cm/dyne (100 Hz)</td>
</tr>
<tr>
<td><strong>Wire Used for Coil</strong></td>
<td>PCOCC (see note n°3)</td>
<td>PCOCC (see note n°3)</td>
<td>PCOCC (see note n°3)</td>
<td>PCOCC (see note n°3)</td>
<td>PCOCC (see note n°3)</td>
<td>PCOCC (see note n°3)</td>
<td>PCOCC (see note n°3)</td>
<td>PCOCC (see note n°3)</td>
</tr>
<tr>
<td><strong>Recommended Load Impedance</strong></td>
<td>100Ω</td>
<td>100Ω</td>
<td>100Ω</td>
<td>100Ω</td>
<td>100Ω</td>
<td>100Ω</td>
<td>100Ω</td>
<td>100Ω</td>
</tr>
<tr>
<td><strong>Recommended Load Capacitance</strong></td>
<td>200 pF</td>
<td>200 pF</td>
<td>200 pF</td>
<td>200 pF</td>
<td>200 pF</td>
<td>200 pF</td>
<td>200 pF</td>
<td>200 pF</td>
</tr>
<tr>
<td><strong>Inductance</strong></td>
<td>360 mH (1 kHz)</td>
<td>490 mH (1 kHz)</td>
<td>490 mH (1 kHz)</td>
<td>360 mH (1 kHz)</td>
<td>360 mH (1 kHz)</td>
<td>400 mH (1 kHz)</td>
<td>400 mH (1 kHz)</td>
<td>400 mH (1 kHz)</td>
</tr>
<tr>
<td><strong>Impedance</strong></td>
<td>2.200Ω (1 kHz)</td>
<td>2.200Ω (1 kHz)</td>
<td>2.200Ω (1 kHz)</td>
<td>2.200Ω (1 kHz)</td>
<td>2.200Ω (1 kHz)</td>
<td>2.200Ω (1 kHz)</td>
<td>2.200Ω (1 kHz)</td>
<td>2.200Ω (1 kHz)</td>
</tr>
<tr>
<td><strong>DC Resistance</strong></td>
<td>800Ω</td>
<td>800Ω</td>
<td>800Ω</td>
<td>800Ω</td>
<td>800Ω</td>
<td>800Ω</td>
<td>800Ω</td>
<td>800Ω</td>
</tr>
<tr>
<td><strong>Cartridge Weight</strong></td>
<td>8.5 g</td>
<td>6.5 g</td>
<td>6.5 g</td>
<td>6.5 g</td>
<td>6.5 g</td>
<td>5.7 g</td>
<td>5.7 g</td>
<td>5.7 g</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>17.3 (H) x 17.0 (W) x 28.0 (L) mm</td>
<td>17.3 (H) x 16.0 (W) x 28.0 (L) mm</td>
<td>17.3 (H) x 16.0 (W) x 28.0 (L) mm</td>
<td>17.3 (H) x 15.2 (W) x 28.0 (L) mm</td>
<td>17.3 (H) x 16.0 (W) x 28.0 (L) mm</td>
<td>17.3 (H) x 16.0 (W) x 28.0 (L) mm</td>
<td>17.3 (H) x 16.0 (W) x 28.0 (L) mm</td>
<td>17.3 (H) x 16.0 (W) x 28.0 (L) mm</td>
</tr>
<tr>
<td><strong>Mounting</strong></td>
<td>1/2&quot; centers</td>
<td>1/2&quot; centers</td>
<td>1/2&quot; centers</td>
<td>1/2&quot; centers</td>
<td>1/2&quot; centers</td>
<td>1/2&quot; centers</td>
<td>1/2&quot; centers</td>
<td>1/2&quot; centers</td>
</tr>
<tr>
<td><strong>Replacement Stylus</strong></td>
<td>ATN90MLX</td>
<td>ATN440MLb</td>
<td>AT120Eb</td>
<td>AT5V</td>
<td>AT100E</td>
<td>AT95E</td>
<td>AT91</td>
<td>AT3600L or ATN3 (see note n°6)</td>
</tr>
<tr>
<td><strong>Accessories Included</strong></td>
<td>Non-magnetic screwdriver; Two 10 mm installation screws; Two hexagonal nuts; Four washers</td>
<td>Non-magnetic screwdriver; Two 10 mm installation screws; Two hexagonal nuts; Four washers</td>
<td>Non-magnetic screwdriver; Two 10 mm installation screws; Two hexagonal nuts; Four washers</td>
<td>Non-magnetic screwdriver; Two 10 mm installation screws; Two hexagonal nuts; Four washers</td>
<td>Non-magnetic screwdriver; Two 10 mm installation screws; Two hexagonal nuts; Four washers</td>
<td>Non-magnetic screwdriver; Two 10 mm installation screws; Two hexagonal nuts; Four washers</td>
<td>Non-magnetic screwdriver; Two 10 mm installation screws; Two hexagonal nuts; Four washers</td>
<td>Non-magnetic screwdriver; Two 10 mm installation screws; Two hexagonal nuts; Four washers</td>
</tr>
</tbody>
</table>

**Notes:****

2. The extension B or BL indicates only the packaging of the product (Bulk or Blister).
3. PCOCC = Pure Cooper by Ohno continuous casting process.
4. The abbreviation mil is equal to a thousandth of an inch — 1 mil = 0.001 inch = 0.0254 mm = 25.4 μm
5. The AT3600L budget cartridge is exclusively available as a factory fitted entry model for turntable manufacturers only.
6. ATN91 is an upgrade replacement stylus for AT3600L, this replacement is only possible if your turntable tonearm features tracking force adjustment.
# P-mount & U-mount moving magnet cartridges specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>AT3482P</th>
<th>AT300P</th>
<th>AT311EP</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Dual Magnet</th>
<th>Dual Magnet</th>
<th>Dual Magnet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Response</td>
<td>20 to 20,000 Hz</td>
<td>20 to 22,000 Hz</td>
<td>15 to 27,000 Hz</td>
</tr>
<tr>
<td>Channel Separation</td>
<td>24 dB / 15 dB (1 kHz / 10 kHz)</td>
<td>26 dB / 18 dB (1 kHz / 10 kHz)</td>
<td>29 dB / 18 dB (1 kHz / 10 kHz)</td>
</tr>
<tr>
<td>Output Channel Balance</td>
<td>1.5 dB (1 kHz)</td>
<td>1.5 dB (1 kHz)</td>
<td>1.25 dB (1 kHz)</td>
</tr>
<tr>
<td>Output Voltage</td>
<td>5.0 mV (at 1 kHz, 5 cm/sec)</td>
<td>5.0 mV (at 1 kHz, 5 cm/sec)</td>
<td>3.5 mV (at 1 kHz, 5 cm/sec)</td>
</tr>
<tr>
<td>Vertical Tracking Angle</td>
<td>20 degrees (see note a)</td>
<td>20 degrees (see note a)</td>
<td>20 degrees (see note a)</td>
</tr>
<tr>
<td>Vertical Tracking Force Range</td>
<td>1.0 to 1.5 g (1.25g recommended)</td>
<td>1.0 to 1.5 g (1.25g recommended)</td>
<td>1.0 to 1.5 g (1.25g recommended)</td>
</tr>
<tr>
<td>Stylus Shape</td>
<td>Conical</td>
<td>Conical</td>
<td>Elliptical</td>
</tr>
<tr>
<td>Stylus Size</td>
<td>0.6 mil (see note a)</td>
<td>0.6 mil (see note a)</td>
<td>0.3 x 0.7 mil (see note a)</td>
</tr>
<tr>
<td>Stylus Construction</td>
<td>Bonded Round Shank</td>
<td>Bonded Round Shank</td>
<td>Bonded Round Shank</td>
</tr>
<tr>
<td>Cantilever</td>
<td>Carbon Fiber</td>
<td>Alloy Tube</td>
<td>Alloy Tube</td>
</tr>
<tr>
<td>Color: body / styl</td>
<td>Black / Black</td>
<td>Black / Ivory</td>
<td>Black / Ivory</td>
</tr>
<tr>
<td>Wire Used for Coil</td>
<td>TPC</td>
<td>TPC</td>
<td>TPC</td>
</tr>
<tr>
<td>Recommended Load Impedance</td>
<td>47,000 Ω</td>
<td>47,000 Ω</td>
<td>47,000 Ω</td>
</tr>
<tr>
<td>Recommended Load Capacitance</td>
<td>100-200 pf</td>
<td>100-200 pf</td>
<td>100-200 pf</td>
</tr>
<tr>
<td>Inductance</td>
<td>400 mH (1 kHz)</td>
<td>400 mH (1 kHz)</td>
<td>400 mH (1 kHz)</td>
</tr>
<tr>
<td>Mounting</td>
<td>P-mount only</td>
<td>P-mount &amp; 1/2” mount</td>
<td>P-mount &amp; 1/2” mount</td>
</tr>
<tr>
<td>Replacement Stylus</td>
<td>ATN3472P (aluminium cantilever)</td>
<td>ATN3472P</td>
<td>ATN3472SE</td>
</tr>
<tr>
<td>Accessories Included</td>
<td>P-mount black installation screw and nut, plastic protector; Universal 1/2” mount adaptor</td>
<td>P-mount black installation screw and nut, plastic protector; Universal 1/2” mount adaptor</td>
<td>P-mount black installation screw and nut, plastic protector; Universal 1/2” mount adaptor</td>
</tr>
</tbody>
</table>

---

a) Vertical tracking angle of 20 degrees is IEC/DIN standard.

b) The abbreviation mil is equal to a thousandth of an inch - 1 mil = 0.001 inch = 0.0254 mm = 25.4 μm
## Replacement MM cartridges styli for cartridges currently available

### Half inch mount MM cartridges

<table>
<thead>
<tr>
<th>Cartridge</th>
<th>Replacement</th>
<th>Upgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT150MLX</td>
<td><img src="image" alt="" /></td>
<td><img src="image" alt="" /></td>
</tr>
<tr>
<td>AT440MLb</td>
<td><img src="image" alt="" /></td>
<td><img src="image" alt="" /></td>
</tr>
<tr>
<td>AT120Eb</td>
<td><img src="image" alt="" /></td>
<td><img src="image" alt="" /></td>
</tr>
<tr>
<td>AT5V</td>
<td><img src="image" alt="" /></td>
<td><img src="image" alt="" /></td>
</tr>
<tr>
<td>AT100E</td>
<td><img src="image" alt="" /></td>
<td><img src="image" alt="" /></td>
</tr>
<tr>
<td>AT95E (B or BL)</td>
<td><img src="image" alt="" /></td>
<td><img src="image" alt="" /></td>
</tr>
<tr>
<td>AT91 (B or BL)</td>
<td><img src="image" alt="" /></td>
<td><img src="image" alt="" /></td>
</tr>
</tbody>
</table>

### P and U mount MM cartridges

<table>
<thead>
<tr>
<th>Cartridge</th>
<th>Replacement</th>
<th>Upgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT3600L</td>
<td><img src="image" alt="" /></td>
<td><img src="image" alt="" /></td>
</tr>
<tr>
<td>AT311EP</td>
<td><img src="image" alt="" /></td>
<td><img src="image" alt="" /></td>
</tr>
<tr>
<td>AT300P</td>
<td><img src="image" alt="" /></td>
<td><img src="image" alt="" /></td>
</tr>
<tr>
<td>AT3482P</td>
<td><img src="image" alt="" /></td>
<td><img src="image" alt="" /></td>
</tr>
</tbody>
</table>

- ![](image) Replacement styli of the cartridge, will deliver original cartridge specification.
- ![](image) Compatible styli for a given cartridge, will upgrade original cartridge specification.
- ![](image) Compatible styli for a given cartridge, will deliver specification of a different cartridge model.

1. The extension B or BL indicates only the packaging of the product (Bulk or Blister).
2. ATN3600L styli can be used as replacement styli for AT91. The compliance will be modified due to the different design of the cantilever. Note that the Tracking force will have to be adjusted to 3.5 g. Performance will be similar with a slight difference in tonal response, but the 3.5 g Tracking force could result in faster record wear.
3. ATN91 styli can be used as upgrade replacement styli for entry model OEM cartridges AT3600L and AT3600. Different stylus compliance of ATN91 can deliver slightly better tonal response.

Currently we are aware that counterfeit cartridges and styli, with a similar form factor to the AT3600L, AT91 and AT95E are being distributed illegally. The original condition of genuine AT3600L, AT91 and AT95E consist of the following: Audio-Technica circle monogram on the styli, original Audio-Technica packaging (see above). We recommend to purchase from a reseller displaying the official Audio-Technica Authorised Reseller logo.
## Replacement and upgrade styli available in Europe for discontinued cartridges

<table>
<thead>
<tr>
<th>ATN150MLX</th>
<th>ATN440MLb</th>
<th>ATN120E</th>
<th>AT-P</th>
<th>ATN100E</th>
<th>ATN636SE</th>
<th>ATN600L</th>
<th>ATN3472P</th>
<th>ATN3472SE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AT150ANV</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT440MLa</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT440ML</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT140ML</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT140LC</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT120E</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT120ET</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT120E/II</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ATP-1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ATP-2 and ATP-2XN</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ATP-3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT100E/G</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT3600</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT93</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT91ECD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT301EP</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT92ECD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT3482H/U</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AT90CD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Replacement styli of the cartridge, will deliver original cartridge specification.
- Compatible styli for a given cartridge, will upgrade original cartridge specification.
- Compatible styli for a given cartridge, will deliver specification of a different cartridge model.

1. AT150ANV was a Limited Edition. Therefore, after 2012/2013, original replacement styli may not be longer available, ATN150MLX becomes replacement styli.
2. The performance of the system will become the same as ATN440MLb.
3. AT440ML cartridge will be pleasingly upgraded using ATN440MLb due to the MicroLine™ structure of the AT440MLb styli.
4. Using ATN120Eb stylus will upgrade former AT120ET to the same performance as the current AT120Eb.
5. AT120E/II was a low cost version of AT120E, using a bounded round shank diamond (basically a AT100E) produced during a short period of time in 2011. Replacing AT120E/II stylus with ATN120Eb original stylus featuring nude diamond will offer full performance of premium AT120Eb cartridge to your AT120E/II.
6. ATN3472P is a Conical stylus with Aluminium cantilever, using it with any P mount cartridges will turn your current model into a AT300P.
7. ATN3472SE is a 0.3x0.7 mil Elliptical stylus, using it with any of the listed P mount cartridges will turn your current model into a AT311EP.
Replacement styli (PC 106-MC 520)

MicroLine™ replacement styli

**ATN150MLX**
- EAN: 4961310031206
- replacement stylus for AT150MLX
- The ATN150MLX stylus is compatible with AT150ANV cartridge.

**ATN440MLb**
- EAN: 4961310129668
- replacement stylus for AT440MLb
- The ATN440MLa stylus is compatible with AT440ML, AT140ML, AT140LC cartridges.

Elliptical replacement styli for para-toroidal VM cartridges

**ATN120Eb**
- EAN: 4961310129682
- replacement stylus for AT120E
- The ATN120E stylus is also compatible with AT120ET, AT120E/II cartridges (see note 4 page 27).

**ATN100E**
- EAN: 8055146748008
- replacement stylus for AT100E cartridge
- The ATN100E stylus is also compatible with AT100E/G cartridge

Conical replacement styli for para-toroidal VM cartridges

**ATN5V**
- EAN: 4961310120269
- replacement stylus for AT5V cartridge with stainless tension wire
Replacement styli (PC 106-MC 520)

P-mount / U-mount cartridges replacement styli

**ATN3472P**  
Replacement conical styli for AT300P, AT3482P and AT3482H/U  
EAN 5055145739631

**ATN3472SE**  
Replacement elliptical styli for AT311EP  
The ATN3472SE is also compatible with AT92ECD and AT301EP.  
EAN 5055145748022

Replacement styli for ATP-2, ATP-1 and ATP-2XN cartridges

**ATP-N2**  
Replacement stylus for ATP-2 cartridge  
The ATP-2 was included with AT-PL120 turntable from 2005 to 2010.  
The ATP-N2 is also compatible with ATP-2, ATP-1 and ATP-2XN cartridges.  
EAN 4961310059507

Elliptical replacement styli for AT95E cartridges

**ATN95E**  
Replacement stylus for AT95E cartridge  
The ATN95E is also compatible with discontinued models AT93 and AT95.  
EAN 4961310062484

Conical replacement styli

**ATN91**  
Replacement stylus for AT91 cartridge  
The ATN91 is also the compatible styli for CN5625AL and AT90 discontinued cartridges.  
The ATN91 is also the upgrade replacement styli for AT3600L.  
The tracking force of AT3600L equipped with ATN91 is 2g, do not upgrade from ATN3600L to ATN91 when your tonearm does not allowed tracking force adjustment.  
EAN 5055145702116

**ATN3600L**  
Replacement conical styli for AT3600L cartridge  
This ATN3600L styli is compatible with the following cartridges:  
AT3600 - AT3600L - AT3601 - AT3651 - AT3650L - AT3650C - AT3650 - AT3626  
This is also the replacement stylius for turntable models Audio-Technica LP60USB and LP60.  
EAN 5055145748039

Conical Symbol

Elliptical Symbol
### Removable headshell for half-inch cartridges

#### AT-Ti15ANV
- Machined pure titanium limited edition headshell
- High rigidity pure titanium body reduces unnecessary vibration and helps reproduce a clear sound.
- Built-in damping material, HANENITE is high-damping rubber, which is excellent at absorbability such as shock or vibration, and transmits the record signals faithfully.
- Pressure bonded design using gold-plated lead tip, combining hybrid conductor, containing gold clad+7N-OFC+PCOCC+OFC with 0.18 mm 12-ply quad hybrid conductor.
- 15g (excluding lead wire)
- 7 pairs of installation screws (3mm, 5mm, 6mm, 8mm, 10mm, 12 mm and 14mm)
- 1 hexagon wrench (for overhanging and tilt adjustment)

#### AT-LH13/OCC
- 13g TechniHard™ adjustable headshell with AT6101 quad wire
- Adjustable overhang and adjustable azimuth (tilt)
- Threaded headshell avoiding use of nuts when fitting cartridge
- 7 pairs of installation screws (3mm, 5mm, 6mm, 8mm, 10mm, 12 mm and 14mm)
- 1 hexagon wrench (for overhanging and tilt adjustment)

#### AT-LH15/OCC
- 15g TechniHard™ adjustable headshell with AT6101 quad wire
- Adjustable overhang and adjustable azimuth (tilt)
- Threaded headshell avoiding use of nuts when fitting cartridge
- 7 pairs of installation screws (3mm, 5mm, 6mm, 8mm, 10mm, 12 mm and 14mm)
- 1 hexagon wrench (for overhanging and tilt adjustment)

#### AT-LH18/OCC
- 18g TechniHard™ adjustable headshell with AT6101 quad wire
- Adjustable overhang and adjustable azimuth (tilt)
- Threaded headshell avoiding use of nuts when fitting cartridge
- 7 pairs of installation screws (3mm, 5mm, 6mm, 8mm, 10mm, 12 mm and 14mm)
- 1 hexagon wrench (for overhanging and tilt adjustment)

#### AT-MG10
- 10g headshell magnesium body
- Threaded headshell avoiding use of nuts when fitting cartridge
- 7 pairs of installation screws (3mm, 5mm, 6mm, 8mm, 10mm, 12 mm and 14mm)
- Includes gold plated terminals quad wire

#### AT-LT13A
- 13g headshell aluminium die cast body
- Threaded headshell avoiding use of nuts when fitting cartridge
- 7 pairs of installation screws (3mm, 5mm, 6mm, 8mm, 10mm, 12 mm and 14mm)
- Includes gold plated terminals quad wire

#### AT-HS10SV
- 10g headshell aluminium die cast body - silver finish
- Includes gold plated terminals quad wire

#### AT-HS10BK
- 10g headshell aluminium die cast body - black finish
- Includes gold plated terminals quad wire

#### AT-HS1
- 10g dj style 1/2”-mount cartridge headshell
- This headshell for 1/2”-mount cartridges and 4-pin turntable arm (Audio-Technica, Technics, SME) features all-metal construction and an integral finger lift.
**AT6101**  
Cartridge to headshell PCOCC lead wires  
- Perfect Crystal OCC quad wire (PCOCC high purity oxygen free conductor)  
- 0.12mm x 22 core strand construction  
- 24K gold plated crimped lead tip

**AT618**  
Disc stabilizer  
- 600g  
- Holds record firmly in place stabilizing the record

**AT607**  
Stylus cleaner liquid with brush applicator  
- 10ml volume  
- Applicator brush is attached to the cap for ease of use

**AT6012**  
Record care kit  
- Scientific record-care formula gently removes microdust and other contaminants, dissolves fingerprints, and eliminates static electricity  
- Velvet brush pad reaches into grooves  
- Inner reservoir directs the record care solution into brush pad’s leading edge  
- For LP/EP use only (do not use for Shellac records)  
- A two-ounce bottle of A-T Record Care Solution is available separately as AT634

**AT634**  
Record care solution  
- One bottle supplied with AT6012 record care kit

**AT615**  
Turntable leveler  
- Precise level for horizontal adjustment of turntable  
- Machined aluminium housing

**AT6180**  
Stroboscopique disc (50 Hz / 60 Hz) 33 and 45 rpm

**P20008**  
Non-magnetic screw driver

**P00009**  
Anti-static stylus brush
33rpm
very often denotes 12” LP Vinyl records (1849-Today), that should be played at a speed of 33 1/3 rpm, rpm stands for Rotation Per Minute.

45rpm
45rpm very often denotes 7” Vinyl records, (1949-Today) that should be played at a speed of 45rpm, rpm stands for Rotation Per Minute.

78rpm
78rpm very often denotes 10” Shellac SP Gramophone records (1925-1950) that should be played at a speed of 78rpm, rpm stands for Rotation Per Minute.

Anti-skating
When the record is in play, the friction between the stylus in the groove of the record and the length of the arm (the distance between the tip and the arm bearing) creates a force that pushes the cartridge toward the center of the disk. Anti-skating creates a force that pulls the arm towards the outer edge of the disc to compensate it. Because records don’t have a constant amplitude, a static compensation will never totally cure the problem. It is a matter of balance. Badly set anti-skating will produce channel balance and distortion issues. When the anti-skating is set too high, the left channel will distort during loud passages, while on the other side if it’s too low, the right channel will distort. Also the amount of anti-skating depends on the shape of the tip. Conical styli have more anti-skating (due to the amount of friction generated by the shape) than more complex shapes (due to the amount of friction generated by their shape) more complex shapes (Line contact or Micro linear).

Azimuth
(see also Tilt)
For magnetic tape drives, azimuth refers to the angle between the tape head and magnetic tape. For phono cartridges, Azimuth is the angle between the surface of the record and the vertical axis of the cartridge. Note the difference between cartridge removable head shells: some models such as the “Technihard series” (page 32) feature an “azimuth” adjustment. This feature is particularly useful when it is not provided by the tone arm itself.

Bonded diamond
Bonded diamond refers to a stylus where the diamond tip is glued on a metal shank that is itself glued into the hole of the cantilever. This construction may increase the mass of the overall tip and affect transient reproduction compared with nude styli that are preferred and used on higher-priced models.

Boron (boron cantilever)
Boron is a chemical element from the metalloid family, extracted from Borax and Kerinite. Its atomic number is 5. Boron is used for high-end cantilevers due to its lightweight and high-rigidity properties. It reaches a score of 9.5 on the Mohs hardness scale (for reference Diamond scores 10 and Aluminiumum 3).

Cantilever (stylus cantilever)
Stylus are principally made of three components: Stylus Tip, Stylus Cantilever, and Stylus Suspension. The cantilever is a tiny suspended “arm” (solid or pipe) that holds the Diamond Tip on one end and transfers the vibrations to the other end where the Magnets (in case of MM cartridges) or the Coils (in case of MC cartridges) are housed. Different materials are used to make a cantilever: Aluminium, Saphyr, Beryllium, boron... The lighter and stiffer being the best.

Cartridge (Phono Magnetic Cartridge)
The phono cartridge is the transducer used for the playback of gramophone records. The phono cartridge converts the mechanical energy (vibrations) from a stylus riding in a record groove into an electrical signal that will be amplified then processed, recorded, or played through a sound system.

Channel Balance
The channel balance of a cartridge is the ability of the transducer to reproduce left and right channels in the same manner. Channel balance should be part of the cartridge specifications, it expresses the possible output difference in dB from one channel to another. A cartridge with ideal channel balance will playback any mono signal with equal level in both channels. The channel balance will be 0dB. The ratio of the signals between the two channels is specified in dB. Channel imbalance can result in several factors independent from the cartridge itself: mechanical factors include incorrect azimuth settings, misalignment of the tonearm and/or of the cartridge on the headshell, and/or improper anti-skating adjustment. Other Channel imbalance issues, independent from the cartridge or the turntable, could include mismatched cables, electronic elements such as stereo preamplifiers, speaker system, speaker positioning and/or room acoustics.

Channel Separation
The channel separation of a cartridge is the ability of the transducer to deliver only signal on the left channel of the cartridge, and nothing on the right channel when there is only signal on the left channel groove, and vice versa. Channel separation is frequency dependent. Audio-Technica indicate in the specifications the Channel separation, specified at 1kHz. For high-end cartridges, Audio-Technica provides channel separation curves, showing the separation in dB from 20Hz to 20,000Hz. A high channel separation provides a better stereo image.

Compliance
Compliance is the inverse of stiffness. Every cartridge works as a suspension, a high compliance cartridge will be suited for a low mass tonearm and a low compliance (stiffer) cartridge will be suited for a high mass tonearm. There is not a perfect compliance number, the cartridge compliance together with the effective mass of the tonearm/cartridge combination determine the tonearm’s fundamental resonance. For optimal results the frequency should be maintained between 9-13Hz.

Connecting (the phono cartridge)
To install a Phono cartridge, connect the four wires of the cartridge headshell to the correct terminals on the back of the cartridge. The four wires are colour-coded and generally labeled as follows : Left Channel: White Left Channel Ground: Blue Right Channel: Red Right Channel Ground: Green

Conical (form factor of the diamond stylus)
Also called spherical, because of the shape of the tip of the cone. Conical shaped styli are simple to produce, therefore it becomes the most popular when economy is a factor.

Counterweight (Tonearm Counterweight)
Counterweight is a mass inside the tonearm, which will balance the anti-skating weight. When the tonearm is in a vertical position, there is no counterweight. Usually the counterweight is not moved, but the arm rests are, in order to avoid the anti-skating device. The counterweight is very important on a fixed V-shape tonearm.

Dual Moving Magnet cartridge
Audio-Technica’s patented Vertical Dual Magnet phono cartridge, unlike conventional cartridges, use the 90° V-Shape of the cutter head. The standard cutter head (used to record the vinyl master) uses two transducer coils, mounted perpendicular to each other at 45° from horizontal, to cut the channel: one in each wall of the 90° record groove.

Channel Balance
The channel balance of a cartridge is the ability of the transducer to reproduce left and right channels in the same manner. Channel balance should be part of the cartridge specifications, it expresses the possible output difference in dB from one channel to another. A cartridge with ideal channel balance will playback any mono signal with equal level in both channels. The channel balance will be 0dB. The ratio of the signals between the two channels is specified in dB. Channel imbalance can result in several factors independent from the cartridge itself: mechanical factors include incorrect azimuth settings, misalignment of the tonearm and/or of the cartridge on the headshell, and/or improper anti-skating adjustment. Other Channel imbalance issues, independent from the cartridge or the turntable, could include mismatched cables, electronic elements such as stereo preamplifiers, speaker system, speaker positioning and/or room acoustics.

Channel Separation
The channel separation of a cartridge is the ability of the transducer to deliver only signal on the left channel of the cartridge, and nothing on the right channel when there is only signal on the left channel groove, and vice versa. Channel separation is frequency dependent. Audio-Technica indicate in the specifications the Channel separation, specified at 1kHz. For high-end cartridges, Audio-Technica provides channel separation curves, showing the separation in dB from 20Hz to 20,000Hz. A high channel separation provides a better stereo image.

Compliance
Compliance is the inverse of stiffness. Every cartridge works as a suspension, a high compliance cartridge will be suited for a low mass tonearm and a low compliance (stiffer) cartridge will be suited for a high mass tonearm. There is not a perfect compliance number, the cartridge compliance together with the effective mass of the tonearm/cartridge combination determine the tonearm’s fundamental resonance. For optimal results the frequency should be maintained between 9-13Hz.

Connecting (the phono cartridge)
To install a Phono cartridge, connect the four wires of the cartridge headshell to the correct terminals on the back of the cartridge. The four wires are colour-coded and generally labeled as follows : Left Channel: White Left Channel Ground: Blue Right Channel: Red Right Channel Ground: Green

Conical (form factor of the diamond stylus)
Also called spherical, because of the shape of the tip of the cone. Conical shaped styli are simple to produce, therefore it becomes the most popular when economy is a factor.

Counterweight (Tonearm Counterweight)
Counterweight is a mass inside the tonearm, which will balance the anti-skating weight. When the tonearm is in a vertical position, there is no counterweight. Usually the counterweight is not moved, but the arm rests are, in order to avoid the anti-skating device. The counterweight is very important on a fixed V-shape tonearm.

Dual Moving Magnet cartridge
Audio-Technica’s patented Vertical Dual Magnet phono cartridge, unlike conventional cartridges, use the 90° V-Shape of the cutter head. The standard cutter head (used to record the vinyl master) uses two transducer coils, mounted perpendicular to each other at 45° from horizontal, to cut the channel: one in each wall of the 90° record groove.
This way, the cartridge achieves accurate tracking, excellent channel separation, high definition of the stereo image and extreme clarity over the entire audio spectrum.

**Elliptical**
(form factor of the diamond stylus)
An Elliptical stylus is produced starting from a Conical Stylus, then two cuts are made in order to make the vertical contact longer and the front to back contact narrower. The elliptical tip follows the groove modulation with more precision than a conical tip, improving frequency response, phase response, and lowering distortion, specifically in the inner turns of the record. The elliptical tip of the diamond is such that it allows a contact surface between 50 and 75 μm². The shape is “similar” to other diamond tips known as Shibata.

**Load**
When connected to a phono preamp, the cartridge forms a RLC (Resistor, Inductor, Capacitor) circuit which acts as a resonant filter emphasizing certain frequencies while reducing others. In order to achieve the best linear frequency response, manufacturers specify several load values (load capacitance, load impedance and so on). By following these specifications for the choice of the phono stage, one can achieve the best sonic results.

**Frequency Response**
Frequency response is the quantitative measure of the output spectrum of the cartridge in response to the stimulus of the record groove modulation. It is a measure of the magnitude for the output as a function of frequency; typically measured in decibels (dB). In the case of cartridge measurement, the input signal will be a constant-amplitude pure tone through the bandwidth provided by a reference record.

**Impedance**
The impedance is a measure of the total opposition that a circuit presents to alterate electric current. The output impedance of an electronic device is the impedance of its internal circuit “seen” by any device connected to its output. The Input impedance of an electronic device is the impedance “seen” by any source connected to its input. Input impedance of the phono preamplifier and output impedance of the cartridge should be properly matched to achieve optimal sound. An impedance mismatch will work as a filter and degrade the sound making it dull or harsh depending on the setup. A general rule of thumb is that the input impedance of your phono preamp (also referred to as the load impedance of your cartridge) should be 10 times the output impedance of your cartridge (also called the source impedance).

**Line contact**
(form factor of specific stylus diamonds) Audio-Technica uses Line Contact shape stylus on several high-end cartridge styli. The tip of the diamond is such that it allows a contact surface of around 115 μm². The shape is “similar” to other diamond tips such as SAS, Dynavector or Namiki. The MicroLine™ diamond is different from Line Contact diamonds, also featured on high-end styli. Line Contact tips are also known as “Shibata”, providing a contact surface between 50 and 75 μm².

**MM input**
MM stands for Moving Magnet: an MM input denotes the input stage of a preamplifier is able to handle the signal of a Moving magnet phono cartridge and the MM input also has an input impedance suitable for the output impedance of MM cartridges.

**Monaural**
Monophonic sound reproduction (often called mono) is single-channel audio program material or single channel audio reproduction. Monaural recording on vinyl has been replaced by stereo sound during the mid 60’s. 78rpm records and Vinyl records found in 1952 to 1960 are Monaural. Stereo sound on vinyl records was introduced in 1958.

**Moving Coil cartridges**
The MC design is a tiny electromagnetic generator, but as opposed to MM design, the 2 coils are attached to the stylus (the moving part), and move within the field of a fixed permanent magnet. The coils are much smaller than MM cartridge coils and made from very thin copper wire. This result in a low impedance, low output voltage is standard program material of the record groove. Knowing the Output voltage is an important factor: it will inform of the characteristic of the Phono input needed in the way to use a Moving Coil Phono Cartridge.

**Neodymium**
Neodymium is used as a component in the alloys used to make high-strength, powerful permanent magnets (neodymium magnets). These magnets are widely used throughout the audio industry in products such as microphones, professional loudspeakers, or in-ear headphones, where low mass and volume, and strong magnetic fields, are required.

**Nude Shank diamond**
Nude diamond refers to a stylus when the diamond glued into the hole of the cantilever is made out of one single piece of diamond. This construction as opposed to Bonded shank (jointed) improves the mass of the overall tip and, because the vibrating signal does not have to transfer through two different materials, provides the best possible transient reproduction. Nude styli, although expensive to produce, are preferred and used on the higher priced models.

**Output Voltage**
(output of a cartridge) Amplitude in mV of the electrical signal delivered by the cartridge for a given standard program material of the record groove. Knowing the Output voltage is an important factor: it will inform of the characteristic of the Phono input needed in the way to use a Moving Coil Phono Cartridge.

---

**Audio-Technica’s guide to cartridge-making terminology**

**Micro linear**
A specific shape of a stylus diamond, Micro linear is known as MicroLine™. Micro linear styli are known as MicroLine™. MicroLine™ Audio-Technica Trademark which denotes the Micro linear “ridge” shape stylus.

**Magnetic cartridge**
A specific shape of a diamond stylus, Micro linear refers to a particular “ridge shape” stylus. An Audio-Technica trademark, Micro linear styli are known as MicroLine™.

**Capacitor**
A capacitor is a filter emphasizing certain frequencies while reducing others. In order to achieve the best linear frequency response, manufacturers specify several load values (load capacitance, load impedance and so on). By following these specifications for the choice of the phono stage, one can achieve the best sonic results.

**LP Record**
LP stands for Long Play or 33 rpm microgroove format. Introduced by Columbia Records in 1948, it was adopted in the mid-fifties as a new standard by the entire record industry. It became stereophonic in the mid 60’s and is still the standard format of vinyl albums today.

**MM phono input**
MM stands for Moving Magnet: an MM input denotes the input stage of a preamplifier is able to handle the signal of a Moving magnet phono cartridge and the MM input also has an input impedance suitable for the output impedance of MM cartridges.

**Monophonic sound reproduction**
Monophonic sound reproduction (often called mono) is single-channel audio program material or single channel audio reproduction. Monaural recording on vinyl has been replaced by stereo sound during the mid 60’s. 78rpm records and Vinyl records found in 1952 to 1960 are Monaural. Stereo sound on vinyl records was introduced in 1958.

**Moving Coil cartridges**
The MC design is a tiny electromagnetic generator, but as opposed to MM design, the 2 coils are attached to the stylus (the moving part), and move within the field of a fixed permanent magnet. The coils are much smaller than MM cartridge coils and made from very thin copper wire. This result in a low impedance, low output signal but on the other hand it is also very lightweight allowing for a better response and a more detailed reproduction. Moving coil cartridges are extremely small precision devices and as a consequence they are considerably more expensive, but preferred by audiophiles due to measurable and subjectively better performance.

**Moving Magnet cartridges**
The MM design is a tiny electromagnetic generator, but as opposed to the MC (moving coil) design the stylus cantilever carries a pair of small permanent magnets. Those magnets are positioned between two sets of fixed coils forming the tiny electromagnetic generator.

As magnet vibrates in response to the stylus following the record groove, it induces a tiny current in the coils.

**Mu-metal**
(shielding)
Mu-metal is a range of nickel-iron alloys that are notable for their high magnetic permeability. The high permeability makes mu-metal useful for shielding against static or magnetic fields. Mu-metal is frequently used to protect low signal transformers such as the ones found on microphone preamplifier input stages or on the Cartridge step-up transformers used with MC cartridges. Several models of Audio-Technica cartridges use Mu-metal shielding between the left and right sections of the cartridge in order to improve channel separation.

**Neodymium**
Neodymium is used as a component in the alloys used to make high-strength, powerful permanent magnets (neodymium magnets). These magnets are widely used throughout the audio industry in products such as microphones, professional loudspeakers, or in-ear headphones, where low mass and volume, and strong magnetic fields, are required.

**Nude Shank**
Nude diamond refers to a stylus when the diamond glued into the hole of the cantilever is made out of one single piece of diamond. This construction as opposed to Bonded shank (jointed) improves the mass of the overall tip and, because the vibrating signal does not have to transfer through two different materials, provides the best possible transient reproduction. Nude styli, although expensive to produce, are preferred and used on the higher priced models.

**Output Voltage**
(output of a cartridge) Amplitude in mV of the electrical signal delivered by the cartridge for a given standard program material of the record groove. Knowing the Output voltage is an important factor: it will inform of the characteristic of the Phono input needed in the way to use a Moving Coil Phono Cartridge.
order to accommodate a given cartridge. Output voltages may vary from under 0.1mV for the least efficient Moving Coil models on the market, up to 5mV for very efficient Moving Magnet cartridges. Such differences of more than 30dB shows that when selecting a cartridge, the selection of the associated preamplifier, with or without step-up transformer, is essential.

**Overhang** (Cartridge overhang adjustment)

In the case of cartridges mounted on a removable headshell, it could be necessary to adjust the cartridge by several millimeters in order for the stylus to be properly aligned with the tangent of the groove. Older tonearms provide adjustment on their bases in order to perform a proper setting using a tonearm protractor alignment system. Most modern tonearms do not provide this feature. In such a case, it is important to be able to adapt the distance between contact point of the stylus and axis of the tonearms with the Overhang adjustment provided by the cartridge headshell.

**Para-toroidal coil**

Para-toroidal coils are used on high-end Moving Magnet Audio-Technica cartridges, providing better channel separation, channel balance and improved transient response. Para-toroidal inductors are passive electronic components, widely used for transformer construction. The inductor with a closed-loop core can have a higher magnetic field and thus higher inductance and Q factor than similarly constructed coils with a straight core. The advantage of the toroidal shape is that due to its symmetry, the amount of magnetic flux that escapes outside of the core (leakage flux) is minimum; therefore it radiates less electromagnetic interference to nearby circuits or equipment.

**Phono Preamp**

Denotes a preamplifier with an input or a series of inputs capable of handling the output from a Phono cartridge. As opposed to a “standard” line input preamp such as a Microphone input preamplifier, the Phono Preamp will provide the necessary gain, Input impedance matching to the output impedance of the cartridges, and the de-emphasis equalization needed to support the signal originated from the phono cartridge playing a record. In the case of a Vinyl record, the equalization will usually be RIAA.

**Phono Cartridge** (see Cartridge)

**Phono input**

Denotes the pair of input connectors (L&R) of the Phono Preamp.

**Pole Piece**

The pole piece is a structure composed of material of a high magnetic permeability that serves to direct the magnetic field produced by the magnet. A pole piece attaches to and, in a sense, extends a pole of the magnet, hence the name.

**Radius** (stylus Radius)

The radius of a stylus is the distance (R) in either mil (thousandth of an inch) or μm (micro, 10^-6, of a meter). The conical stylus has a unique Radius which varies from 0.6 to 0.7 mil for Vinyl records. (2, 2.5, 3, or 3.5mil for shellac records). The elliptical stylus has two radii, R1 and R2, for the front and side. Standard elliptical Stylis are around 0.3 x 0.7 mil. Due to the complexity of line contact and MicroLine™ stylis, their radius value is not always an accurate description of their shape and size.

**Replacement Stylus**

Stylus assembly of Moving Magnet cartridges are field replaceable. When the diamond is worn out, (between 600 and 1000 hours) or if the cantilever becomes damaged, the stylus assembly needs to be replace. The Stylus assembly represents between 60% to 80% of the cost of a complete cartridge (depending on the nature of the diamond tip). It makes sense, not only for economic reasons but also to avoid work on the cartridge wiring or mechanical position, to replace only the Stylus assembly instead of the complete cartridge.

**RIAA**

RIAA stands for: Recording Industry Association of America (RIAA), the trade organization that represents the recording industry in the United States. Early RIAA standards included the RIAA equalization curve, the format of the stereophonic record groove and the dimensions of records.

**RIAA equalization**

is a specification for the recording and playback of phonograph records. The purpose of the equalization is to permit greater recording times, improve sound quality, and to reduce the groove damage that would otherwise arise during playback. RIAA equalization is a form of pre-emphasis on recording and de-emphasis on playback. A recording is made with the low frequencies reduced and the high frequencies boosted, and on playback the opposite occurs.

**RIAA input**

(Also known as Phono input) Input of a preamplifier section providing the de-emphasis equalization needed to support the signal originating from a phono cartridge playing a vinyl record. (Note: Most 78rpm shellac records produced after 1942 can be played with RIAA equalization, nevertheless we recommend you check the nature of the pre-emphasis used by the record company.)

**Round Shank**

Specifically the shape of the shank where the tip is fitted. Round shank is generally used for shapes that require no or nominal orientation (round, conical elliptical)

**Spherical** (diamond, see conical)

**Square Shank**

Square shank stylis cost more than round shank to make but mounting them in laser cut holes in the cantilever locks them precisely in correct alignment with the record groove. This is the reason why they are used for shapes that need a precise orientation (Line Contact, MicroLine™).

**Step-up Transformer**

An MC cartridge has both a low output voltage (generally below 1mV) and a low output impedance compared to a MM cartridge. The role of the step-up transformer is to raise the output voltage while, at the same time, match the required impedance between your cartridge and the phono preamplifier.

**Stylus Holder** (Stylus Assembly)

The plastic part of an interchangeable stylus that holds the cantilever and the vibrating part, both forming the Stylus assembly. On Moving magnet cartridges, the removable stylus assembly is held in place on the cartridge casing.

**Tilt** (see also Azimuth)

Tilt is the angle between the surface of the record and the vertical axis of the cartridge. This angle should be 90° in order to insure optimal channel balance.

**Tracking Force**

To play back a vinyl disc, the stylus must make good contact with the walls of the record groove. Excessive down force (tracking force or tracking weight) will both wear and not...
Audio-Technica’s guide to cartridge-making terminology

 guarant e that the stylus will perfectly follow the record groove. Audio-Technica specifies the tracking force, for each cartridge, as a range of recommended values in grams. A cartridge given insufficient tracking force is more likely to cause damage to the groove wall than one whose tracking weight is set at the high-end of the recommended range. The cartridge could lose contact with the groove wall, or “jump”, causing damage to the record as it bounces trying to regain contact.

### Tracking weight (see Tracking force)

### Transient Response

The transient response is the behaviour of a system when a signal is changing from one value to a specified higher value. Rise time (the time required for the signal to change) and Overshoot are among the most important parameters entering under the generic definition, Transient response.

A transducer having a good transient response will result in perceiving that the music material is sharp, with fast accelerations, capable of reproducing accurately and in a realistic manner the fastest impulses of musical instruments.

On a record, the signal is present in the groove, the cartridge is transforming the mechanical groove of the record into an electrical current, and the transient response of the cartridge will essentially respond to fast changing sound waves present into the groove.

Under Transient response, the capacity of the moving parts such as cantilever/stylus/ tension spring assembly to be controlled and not to produce parasitic oscillations is also part of the transient response quality. The capacity of the system after changing to revert to its equilibrium is also important.

### Vertical Tracking Angle

Vertical Tracking Angle is the angle between the record surface and the axis “cantilever-pivot-point” to “stylus-contact-area”.

### Understanding the sizes and shape of Audio-Technica stylus tips and the contact area in the record groove

<table>
<thead>
<tr>
<th>Stylus sizes</th>
<th>Stylus shape</th>
<th>Stylus front view</th>
<th>Stylus horizontal cross-section</th>
<th>Audio-Technica cartridges</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.6mil</td>
<td>Conical</td>
<td></td>
<td></td>
<td>AT33MONO AT-MONO3/LP AT-F7</td>
</tr>
<tr>
<td>0.2 x 0.7mil</td>
<td>Elliptical</td>
<td></td>
<td></td>
<td>AT33EV AT-ART9 AT-OC9/III AT-ART7</td>
</tr>
<tr>
<td>0.3 x 0.7mil</td>
<td>Line Contact</td>
<td></td>
<td></td>
<td>AT33sa AT-OC9ML/II AT33PTG/II</td>
</tr>
</tbody>
</table>

Audio-Technica moving coil cartridges

- AT33MONO AT-MONO3/LP AT-F7
- AT33EV AT-ART9 AT-OC9/III AT-ART7
- AT33sa AT-OC9ML/II AT33PTG/II

Audio-Technica moving magnet cartridges

- AT5V AT91
- AT120E AT100E - AT95E
- AT150MLX AT440MLb

Audio-Technica moving magnet P-mount cartridges

- AT3482P AT300P
- AT311EP

Dimensions (see Stylus side view)

- R = 0.6mil = 15.25µm r = 0.2mil = 5.08µm
- R = 0.7mil = 17.8µm r = 0.3mil = 7.62µm
- R = 40µm r = 7µm
- R = 75µm r = 5µm
- R = 75µm r = 2.5µm

### Approximate contact dimensions ratio

- D1/D2 = 1
- D1/D2 = 1.85
- D1/D2 = 1.60
- D1/D2 = 2.25
- D1/D2 = 3
- D1/D2 = 6

D2 represents the contact dimension at the horizontal plane while D1 shows the contact dimension at the vertical plane. These two dimensions indicate the contact area between the record groove walls and the styli. D2 must be as small as possible to track small groove variations (high frequency). The total contact area should as large as possible to minimize record wear and maximize accurate reproduction. The larger the area, the smaller pressure from the cartridge on the record; as opposed to the smaller the area, the more pressure is applied on a specific point of the groove, leading to record wear.

We can see from the above table that the Line Contact and Micro Linear shapes offers a smaller horizontal contact area leading to superior precision and high frequency transcription, while offering a larger contact area than conical and elliptical styli due to taller a vertical contact area minimizing record wear.

Vinyl (see also LP record)

Vinyl for most people denotes a 12 inch, 33rpm, microgroove LP record. The word Vinyl comes from the chemical form of the material used to produce LP records: vinyl chloride. Vinyl for most people denotes a 12 inch, 33rpm, microgroove LP record. The word Vinyl comes from the chemical form of the material used to produce LP records: vinyl chloride. An important industrial application of this molecule is PVC (Poly Vinyl Chloride), the plastic commonly known as vinyl.

VM™ (see Dual Magnet cartridge)

Cartridge-making Dictionary

Audio-Technica’s guide to cartridge-making terminology
### alphanumeric product listing

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT-ART7</td>
<td>9</td>
</tr>
<tr>
<td>AT-ART9</td>
<td>8</td>
</tr>
<tr>
<td>AT-F3 (discontinued, see AT-F7 or AT-F2)</td>
<td>12</td>
</tr>
<tr>
<td>AT-F7</td>
<td>12</td>
</tr>
<tr>
<td>AT-HS1</td>
<td>30</td>
</tr>
<tr>
<td>AT-HS10BK</td>
<td>30</td>
</tr>
<tr>
<td>AT-HS10SV</td>
<td>30</td>
</tr>
<tr>
<td>AT-LH13/OCC</td>
<td>30</td>
</tr>
<tr>
<td>AT-LH15/OCC</td>
<td>30</td>
</tr>
<tr>
<td>AT-LH18/OCC</td>
<td>30</td>
</tr>
<tr>
<td>AT-LT13A</td>
<td>30</td>
</tr>
<tr>
<td>AT-MG10</td>
<td>30</td>
</tr>
<tr>
<td>AT-MONO3/LP</td>
<td>13</td>
</tr>
<tr>
<td>AT-MONO3/SP</td>
<td>13</td>
</tr>
<tr>
<td>AT-OC9/III</td>
<td>7</td>
</tr>
<tr>
<td>AT-OC9/III LTD</td>
<td>6</td>
</tr>
<tr>
<td>AT-OC9ML/II</td>
<td>7</td>
</tr>
<tr>
<td>AT-Ti15ANV</td>
<td>30</td>
</tr>
<tr>
<td>AT100E</td>
<td>20</td>
</tr>
<tr>
<td>AT120Eb</td>
<td>19</td>
</tr>
<tr>
<td>AT120E/II (discontinued, see AT120Eb)</td>
<td>19</td>
</tr>
<tr>
<td>AT120ET (discontinued, see AT120Eb)</td>
<td>19</td>
</tr>
<tr>
<td>AT140ML (discontinued, see AT440MLb)</td>
<td>16</td>
</tr>
<tr>
<td>AT140LC (discontinued, see AT440MLb)</td>
<td>19</td>
</tr>
<tr>
<td>AT150ANV (discontinued, see AT150MLX)</td>
<td>18</td>
</tr>
<tr>
<td>AT150MLX</td>
<td>18</td>
</tr>
<tr>
<td>AT300P</td>
<td>22</td>
</tr>
<tr>
<td>AT311EP</td>
<td>23</td>
</tr>
<tr>
<td>AT33EV</td>
<td>11</td>
</tr>
<tr>
<td>AT33MONO</td>
<td>13</td>
</tr>
<tr>
<td>AT33PTG/II</td>
<td>11</td>
</tr>
<tr>
<td>AT33sa</td>
<td>10</td>
</tr>
<tr>
<td>AT3482P</td>
<td>22</td>
</tr>
<tr>
<td>AT3600L</td>
<td>21</td>
</tr>
<tr>
<td>AT440MLb</td>
<td>19</td>
</tr>
<tr>
<td>AT440ML (discontinued, see AT440MLb)</td>
<td>19</td>
</tr>
<tr>
<td>AT5V</td>
<td>20</td>
</tr>
<tr>
<td>AT6012</td>
<td>31</td>
</tr>
<tr>
<td>AT607</td>
<td>31</td>
</tr>
<tr>
<td>AT6101</td>
<td>31</td>
</tr>
<tr>
<td>AT615</td>
<td>31</td>
</tr>
<tr>
<td>AT618</td>
<td>31</td>
</tr>
<tr>
<td>AT634</td>
<td>31</td>
</tr>
<tr>
<td>AT6180</td>
<td>31</td>
</tr>
<tr>
<td>AT91/BL</td>
<td>21</td>
</tr>
<tr>
<td>AT93 (discontinued, see AT95)</td>
<td>21</td>
</tr>
<tr>
<td>AT95E/BL</td>
<td>21</td>
</tr>
<tr>
<td>ATN100E</td>
<td>28</td>
</tr>
<tr>
<td>ATN120Eb</td>
<td>28</td>
</tr>
<tr>
<td>ATN150MLX</td>
<td>28</td>
</tr>
<tr>
<td>ATN3472P</td>
<td>29</td>
</tr>
<tr>
<td>ATN3472SE</td>
<td>29</td>
</tr>
<tr>
<td>ATN3600L</td>
<td>29</td>
</tr>
<tr>
<td>ATN440MLb</td>
<td>28</td>
</tr>
<tr>
<td>ATN5V</td>
<td>28</td>
</tr>
<tr>
<td>ATN91</td>
<td>29</td>
</tr>
<tr>
<td>ATN95E</td>
<td>29</td>
</tr>
<tr>
<td>ATP-N2</td>
<td>29</td>
</tr>
<tr>
<td>AT33MONO</td>
<td>13</td>
</tr>
<tr>
<td>AT33PTG/II</td>
<td>11</td>
</tr>
</tbody>
</table>
The quality and musicality of the Audio-Technica phono cartridges of today is the result of 50 years of heritage, the dedication of our design engineers and the handcraftsmanship of our production staff.

In 2010, the production of Audio-Technica cartridges was relocated to the state-of-the-art Technica Fukui facility in Echizen City, Fukui Prefecture, Japan. Technica Fukui integrates the three pre-existing Audio-Technica branches into one location, consolidating and streamlining design efforts with increased collaboration among Audio-Technica’s global design teams.

A note from the Editorial Team

Audio-Technica entered the cartridge business in 1962 with AT-1 when the company was formed. After 50 years of development and to honour our founder Hideo Matsushita, we feel the need to show our achievements and to provide this catalogue of our cartridges and vinyl related products for your guidance. We had originally planned for catalogue to be 8 pages, but in the end it became 36 pages. We will have succeeded if our readers and customers can share just a small part of the passion of the people who develop and manufacture Audio-Technica cartridges.