

ortofon

A<sup>90</sup>

# Ortofon

## World leader in the cartridge industry

Ortofon has always been a company in the field of sound reproduction. Founded in Copenhagen in 1918, it started by creating technology which served as the basis for adding a soundtrack to the silent movies of the early 1920s. In 1948, the company developed the first moving coil cartridge, and since then Ortofon has developed and manufactured more than 300 different cartridges.

Today Ortofon is the world leader in cartridges. This is the result of combining design with technology and the highest level of engineering in the audio industry. Acoustics, materials technology and micro mechanics are key competences in Ortofon's technological prowess. Ortofon has its research and manufacturing facilities in Denmark; the production of cartridges and components is carried out at the company's factory in Nakskov, Denmark.

Production is based on experienced workers with a high level of craftsmanship. This assures the high uniform quality of Ortofon products. The cartridges are sold worldwide through a network of more than 60 importers and sales subsidiaries in the USA and Japan. Ortofon is today recognized among consumers and industry professionals as a quality brand.

# A90

The A90 not only celebrates the past 90 years of Ortofon, first and foremost it also makes history by significantly raising the standards by which sound reproduction is measured, making it a celebration of sound itself. This impeccably crafted cartridge carries with it the culmination of decades of research in the field of analogue sound reproduction along with the world's best engineering, materials, and manufacturing techniques. Combined with the inspiration of the very best ears and minds in contemporary analogue technology, the A90 stands as a true contender for the best moving coil pickup of all time.

Those who choose to adopt the A90 will experience the lifelike, open sound, with exceedingly clear midrange for a presentation that is unparalleled. The A90 remains extremely musical while paying close attention to micro dynamic details, with its delicate, but also analytical nature. Lovers of music will take note of a truly organic and encapsulating experience which transcends the boundaries of recording and undeniably blurs the distinction between what is live and what is recorded.



# Magnet

## Neodymium magnet with FSE

The magnet system is based on the designs used in the revered Kontrapunkt series, the MC Jubilee, and the MC Windfeld. It is based on an extremely strong, compact neodymium magnet, which makes the generator system both compact and lighter through its minimal dimensions.

Ortofon's Field Stabilizing Element, a small cylinder of conductive material strategically placed inside the magnet system, guarantees that the force field remains stable regardless of the movement of the armature. FSE improves the channel separation, while at the same time minimizing dynamic distortion and intermodulation. The result: fantastic dynamics and even more elbow room between the musicians. You simply experience more drama and greater breadth, height and depth in the sound scenario!



# Damping

## WRD system

Adding to the list of important components is Ortofon's patented Wide Range Damping (WRD) system. In this system, a small, heavy platinum disc is sandwiched between two rubber absorbers, both with different properties. This ensures not only an exceptional tracking performance, but also create a perfect damping through the entire frequency spectrum. Because of this, distortion and resonance are virtually eliminated entirely.

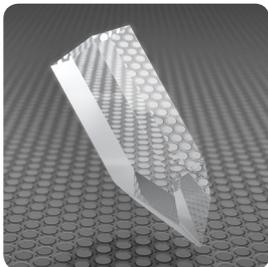
The WRD system, which was originally introduced in the MC 20 Mk II in 1979 and was also used in the MC Windfeld and many of Ortofon's other top tier cartridges, is one significant reason why the MC A90, while achieving the most linear frequency response and the highest upper frequency limit ever, at the same time tracks a fantastic 100  $\mu\text{m}$  at a vertical tracking force of 2.3 grams.



## SLM manufacturing

An engineering feature adding to the damping capability of the MC A90 cartridge is the recently developed Selective Laser Melting process in which fine particles of stainless steel are welded together, layer-by-layer, to construct a single piece body devoid of unnecessary material. Using this technique, for which Ortofon has a patent pending, the density of the body can be precisely controlled, allowing for extremely high internal damping. The final result provides absolute freedom from resonances existing in the cartridge body material and allows for the MC A90 to be perfectly matched with an extremely wide array of different tonearms. Because of the nature of SLM-based construction, each cartridge body is cosmetically unique and will show small dimples or lines under close examination.

# Diamond



## The finest diamond in the world

Another precondition for linear reproduction with a wide frequency range and optimal tracking performance is a diamond - the shape of which is as close as possible to the original cutting needle. To achieve this, the Ortofon MC A90 uses an ultra-fine and extra polished version of the unique Ortofon Replicant Stylus 100. This diamond, which is already known from products such as the famous MC-3000 Mk II and MC-5000 cartridges, is incredibly small and light, but has an extraordinarily large vertical contact surface despite its minimal radius of rounding. Correctly fitted at a vertical angle of 23 degrees, an Ortofon Replicant Stylus 100 will read the musical information in the grooves of a record with a greater degree of accuracy than any other kind of needle.

# Material

## Extremely high end materials benefit new coil technology

Using expensive Aucurum coils of gold-plated, 6NX oxygen free copper allows for zero-loss transmission of the diamonds movements via its boron cantilever. This combination, which has also been employed for use in the legendary MC Windfeld, combine low moving mass with an extremely high degree of rigidity.

Of course, a specially designed armature had to be created to achieve extreme precision in each coil turn in all layers. This enables the A90 to achieve a higher degree of channel separation, while simultaneously offering lower distortion and better channel balance. A low output impedance of 4 ohm and a medium output voltage of 0.3 mV make the Ortofon MC A90 a perfect partner for most step-up transformers as well as active MC pre-amps. With optimal weight and compliance to suit the vast majority of modern medium-mass tonearms, the A90 is easily compatible with a seemingly endless array of modern contemporary high end turntable equipment.

# Design

With the presentation of the Ortofon MC A90 also comes the development of new paradigms in engineering and manufacturing. Because total freedom from resonance in the audible frequency range is a precondition for optimal sound quality, the design of the MC A90 has been dictated by the complete elimination of unwanted resonance. Arguably the most exciting development in the A90 is the introduction of our custom SLM manufacturing process, a first in the cartridge industry for which Ortofon has a patent pending.

By combining the utilization of this SLM process, our patented WRD system, and zero-resonance spikes, we are confident that the perfect mechanical integration of this cartridge with your tonearm will result in a significant and breathtaking increase in dynamics, resolution, and richness in detail.

When combined with Ortofon's world-class knowledge in analogue sound reproduction, the A90 will undoubtedly provide sound which is literally unsurpassed and simply has to be experienced. Of course, aesthetically, the MC A90 has a distinctive, elegant design which makes no compromises.



# Setup

## Connecting

Please correlate the colour code for the terminals on the drawing with the colour coding on the cartridge. The terminals for right and left channel have the same position as normal for Ortofon cartridges. We recommend to mount the enclosed lead wires on cartridge and tonearm before aligning and calibrating the cartridge. The length of the enclosed lead wires will fit a distance between cartridge and tonearm terminals of 35mm, which will work with most head shells.

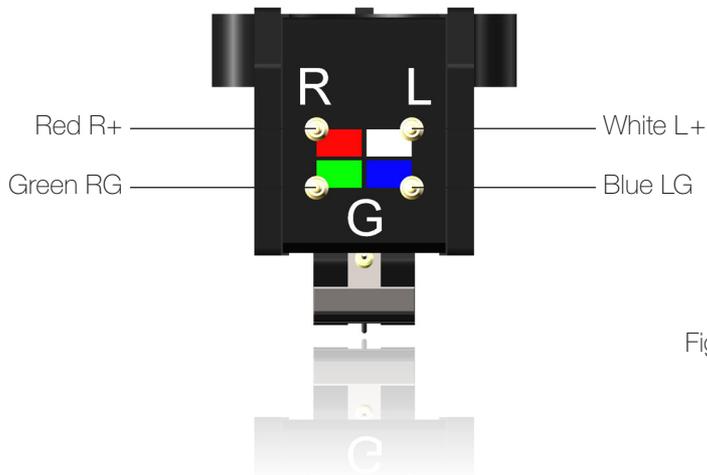


Fig. 1

## Mounting

For mounting the cartridge to the head shell you have 4 pairs of screws at your disposal. It is of great importance to use the right length of screws when mounting the cartridge. Using too long screws may stop the screws inside the cartridge resulting in insufficient mounting in the head shell. The choice of screw length is depending on the thickness of the head shell, and a maximum of 2.5mm free screw length under the head shell: For head shells up to 2mm, use 3mm screws. For head shells between 2mm and 3mm, use the 4mm screws from the packing. For head shells between 3mm and 4mm, use the 5mm screws and for head shells thicker than 4mm use the 6mm screw.

Mount the cartridge loosely to the head shell during this procedure.

## Antiskating

For the MC A90 stylus type, just set normal antiskating, according to recommended tracking force.

# Adjustment

## Mirror

In order to attain maximum channel separation, it may be possible to adjust the azimuth.

Should the cartridge not be perfectly perpendicular to the record's surface, the tonearm or headshell may require to be tilted a few degrees. Correct azimuth is established by observing the reflected image of the 2 parallel cartridge front lines. The cartridge's front lines must form a straight line with the reflected lines. A flat mirror may also be used to facilitate this process. Fig. 2.

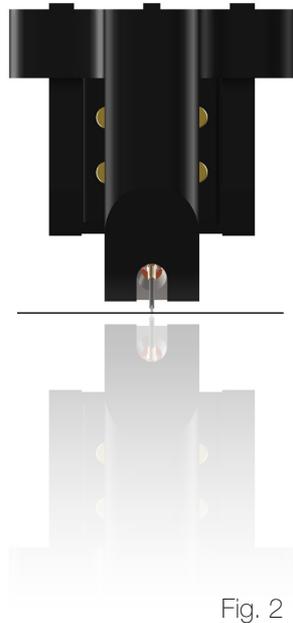


Fig. 2

# Protection

## Stylus Guard

The A90 ships with a newly engineered stylus guard which is designed to be easily replaced and removed without risking contact to the fragile stylus assembly. Unlike traditional stylus guards, this new design is both safer and more effective. To avoid accidental damage to the stylus or cantilever please mount the enclosed stylus guard onto the cartridge whenever the cartridge is not in use. Fig 3.

This also includes whenever the cartridge is being mounted or removed from the headshell. As illustrated by the diagram, the stylus guard is simply removed by pulling on the protruding handle between the thumb and forefinger. Affixing the stylus guard is simply achieved by lining up the posts with the corresponding holes on the side of the cartridge body. Fig 4.



Fig. 3



Fig. 4

# Maintenance

## Stylus care

Ortofon does not recommend the use of solvents of any kind for cleaning of either record surface or stylus. If necessary, records may be washed in lukewarm demineralized water with a dash of sulphonic soap. Remove dust carefully from record surfaces by using a fine antistatic brush or cloth before every use. The use of solvents on the stylus and cantilever may damage stylus cement; interior parts of the cartridge can be affected seriously by the intrusion of solvents.

The Ortofon warranty will not be valid in cases where such treatment has caused malfunction. For cleaning the stylus, use the enclosed fiber brush a few times along the cantilever in the direction of the stylus, whenever you play a new record or change sides. This will take all normal dust and most of the slick release agent from new records.

## Cartridge break-in

Although the A90 will provide top reproduction right out of the box, the cartridge may slightly change character during the first tens of hours of use. This is completely normal and you may, in fact, find that this adds further refinement to your listening experience.

## Ortofon exchange service

Owing to the design of the Ortofon moving coil cartridge, the stylus is not part of a replaceable assembly and therefore Ortofon offers, through its dealers, an exchange service. If you should have the need for this service, please contact your local Ortofon dealer.

# MC A90 Technical Data

TECHNICAL DATA	MC A90
Output voltage at 1 kHz, 5cm/sec.	270 $\mu$ V
Channel balance at 1 kHz	< 0,2 dB
Channel separation at 1 kHz	> 28 dB
Channel separation at 15 kHz	> 22 dB
Frequency range at - 3dB	10 Hz - 80 kHz
Frequency response	20 Hz - 20 kHz + / - 1 dB
Tracking ability at 315 Hz at recommended tracking force	100 $\mu$ m
Compliance, dynamic, lateral	16 $\mu$ m/mN
Stylus type	Special polished Nude Ortofon Replicant 100 on Boron Cantilever
Stylus tip radius	r/R 5/100 $\mu$ m
Tracking force range	2,0-2,5 g (20-25 mN)
Tracking force, recommended	2,3 g (23 mN)
Tracking angle	23°
Internal impedance, DC resistance	4 Ohm
Recommended load impedance	> 10 Ohm
Cartridge body material	SLM Stainless Steel
Cartridge colour	Black
Cartridge weight	8 g

ortofon

Date:

Approved by: