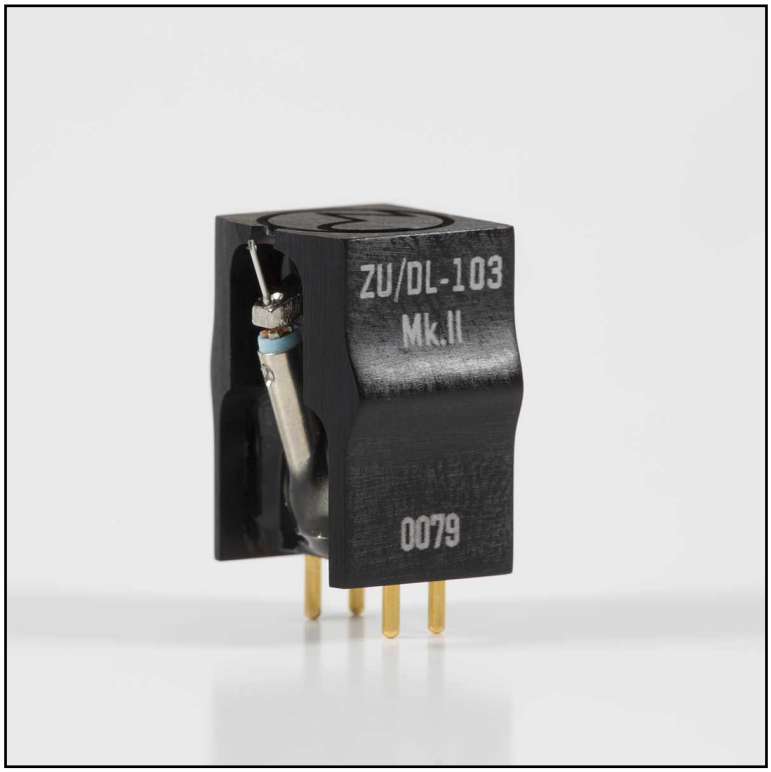
# ZU/DL-103 Mk.II

[Rev-B]




## AD COPY + SPECIFICATIONS

8 | 2014

[Copy Rev-C]

# ZU/DL-103 MK.II COPY + SPEC'S

**ZU AUDIO ZU/DL-103 Mk.II [REV-B] PHONOGRAPH PICKUP CARTRIDGE**

WARNING: If using a stylus brush make sure nap is 1/8" [3mm] or less. Using a brush with nap long enough to enter the coils can damage the leads—WARRANTY DOES NOT COVER BROKEN LEADS.

WARNING: Do not solder to the pickup's output pins. This will very likely damage the pickup's lead wires, which is not covered by warranty.

WARNING: Do not expose the pickup to temperatures greater than 200 °F [93 °C], heat cycles with temps greater than 200 °F [93 °C] will degrade your damper and shorten the life of your pickup. (Yo DJs, don't leave this pickup on the dash!)

NOTE: The housing design of the Zu/DL-103 Mk.II improves fidelity, helps safeguard the cantilever and provides dead-on sighting and cuing. Still, the Zu/DL-103 Mk.II cartridge is semi-naked and care should be taken when handling. The most common cantilever breakage happens when cleaning your record player—we recommend you install the stylus guard anytime you dust your deck.

The Zu/DL-103 Mk.II is built to fall within EIA dimensions and can be mounted on any commercially available universal tonearm. The Zu/DL-103 pickups weigh 14 grams, please consult with the tonearm manufacturer if there's a question of weight compatibility; in some cases such as Rega tonearms, a "heavy weight" counterweight may need to be fitted to the tonearm. Rega arms benefit from rigid mount weights anyway so when running a Zu pickup on a Rega arm consider a Michell Technoweight Heavyweight or GrooveTracer 150g.

The Zu/DL-103 Mk.II is a high performance 2-channel stereo moving coil phonograph pickup cartridge. The motor and general electromechanical design of the DL-103 was developed by Denon in collaboration with the Broadcasting Corporation Technical Research Laboratories back in the early 1960s. Objectives for the original called for the creation of a new broadcast standard, for high-performance, high-consistency, high-reliability. The guts of the Zu/DL-103 are largely based on the original DL-103 which is still manufactured by Denon in Japan. The Zu/DL-103 series effort was a two year researched and developed project that began November 2005. Zu acknowledges Phil Ressler for his significant contribution to this product. Mk.II version was the result of our continuing experiments with emerging materials applied to the dynamics of phonograph transduction.

**ALIGNMENT**
For those that want the most accurate alignment, evaluating angles and dimensions from the stylus as it rests on an LP with 2.5 grams of down-force. (Note, rare but worth mentioning, if you are using a vintage table that has a ferrous platter the magnetic attraction of the motor may increase stylus down-force.)

**FIRST, LEVEL THE SUCKER—YOU WANT YOUR STYLUS TO BE ORTHOGONAL TO THE GROOVE**
*Stylus-to-mount distance is 0.585" [14.8mm].* First level your deck, your bubble should be on the platter. Next, look at your stylus; Zu/DL-103 pickups generally sound best when the stylus is orthogonal to the groove and as the Zu/DL-103 features right angles for all primary lines, you are in the butter zone (orthogonal stylus) when the reflection in the record of the Zu/DL-103 is orthogonally mirrored.

To reduce the chance of breaking the cantilever, you might want to zero your tonearm to level before you mount the pickup, which is done like this: Factor the 0.585" [14.8mm] weighted cartridge height (space being the distance from the bottom side of the pickup mount to the top of an LP sitting on the platter) then raise or lower the pivot side of the tonearm until the arm (the pickup mounting plane specifically) is level. Doing this will ensure your VTA (vertical tracking angle) is in the zone. Again, you want your stylus orthogonal. If you want to make certain, put a good camera on a tripod, snap a high resolution closeup, load it into your computer and using Photoshop®, Illustrator®, a CAD program or the like, you can see and measure at magnification.

# ZU/DL-103 MK.II COPY + SPEC'S

**ZU AUDIO ZU/DL-103 Mk.II [REV-B] PHONOGRAPH PICKUP CARTRIDGE**

**STYLUS / GROOVE ALIGNMENT**
To ensure the lowest left/right channel error, level the stylus to the groove and follow the alignment method outlined by the tonearm manufacturer. Those that desire spot on left/right alignment must index from the stylus centered on known or desired nulls within the arc of the pivoting tonearm.

**STYLUS PRESSURE (DOWN-FORCE) ADJUSTMENT**
We recommend 2.5 grams of stylus down-force for normal conditions. Temperature effects the pickup, when it's really warm (temperature is 85 ˚F [30 ˚C]) you might reduce stylus pressure down to say 2.3 grams; increase stylus pressure up to 2.7 grams when the temperature is quite cool, 60 ˚F [16 ˚C].

**ANTI-SKATE SETTING**
You leveled your deck, using the platter as the level surface, yep. You set the elevation of the tonearm so the stylus rides orthogonal to the groove, done. You set left/right pickup/tonearm/groove alignment, check. You set stylus down-force at 2.5 grams, another yep. Now place a test or blank record on your deck, hit play, and drop the needle about half to two-thirds of the way in on the disc and adjust your anti-skate to the point the tonearm doesn't move in or out. This is the very last thing you adjust as everything prior effects the anti-skate dynamics.

**ZU/DL-103 PHONO PREAMP MATCHING**
The nominal output voltage of the Zu/DL-103 (all grades) is about 0.3mV. The nominal internal impedance per channel is about 45 ohms. Due to the somewhat low output we recommend running a step-up transformer for moving magnet (MM) phono preamps. A step-up transformer is not required for phono preamps that have a moving coil (MC) section, these have enough gain built in. When setting the load on a MC phono preamp set your impedance to fall between 100 and 400 ohms. 400 ohm loading gives a slightly looser/fuller bass tone, maybe too loose; 100 ohm loading is tighter, maybe too damp—experiment, every room/rig/listener is unique (200 to 300 ohm load is typical for the majority). You might also consider an inter-stage step-up on your MC phono stage such as a Bob's Devices, K&K Audio, Jensen.... When running a step-up some find running the outputs into the MM with minimum capacitive loading to be the best way to realize the potential of a step-up transformer. But again, you really should experiment and trust your ears and the gray matter they're interconnected with.

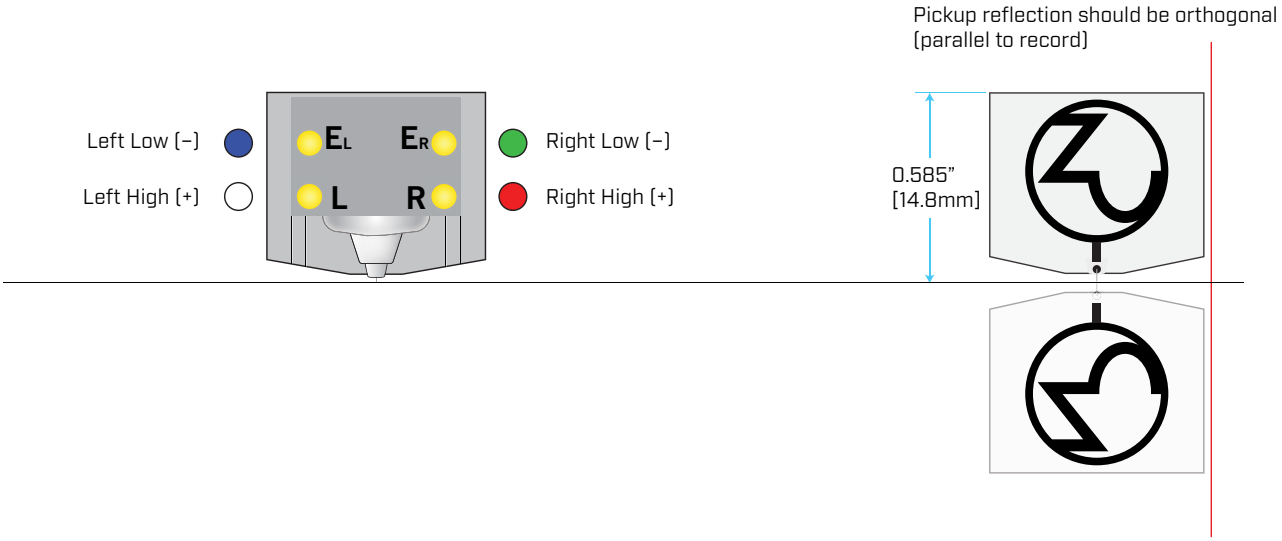
**CLEANING YOUR STYLUS**
Lots of good stuff to use: Needle Nectar, Onzo Zerodust, Musical Surroundings, LAST, Mo-Fi, Mr. Clean Magic Eraser, and yes, in a pinch you can go right ahead and lick your stylus clean, yep with your tongue—just the stylus. Whatever, don't let anything on to or past the damper (little blue band thing). Most solvents degrade the damper and long brush nap are likely to break your coils or coil leads.

The Mk.II update is significant, both in performance and handling usage. The body is machined from 6061-T6 and hard anodized to aid in the matching of tonearm-mount properties and further reduce pickup stored/reflected energy. The shape of the housing has also been refined to reduce resonance and stress risers resulting in a much stronger design that better supports the motor assembly. We have also changed the epoxy matrix formulation that binds the assembly further reducing noise and increases stability of the pickup system. In short we have been able to keep the great tone of the original Zu/DL-103 and significantly improve transparency and resolution particularly in the extremes. As to handling, it has been considered and improved, with design elements to help safeguard the cantilever from damage, stylus guard and housing profile being the most obvious changes. Revision-B has a stylus sighting arch cut into the body to allow easier cueing, stylus has also been moved forward within the housing bringing stylus just short of the front plane. There are no other changes between the original Mk.II Rev-A and Rev-B.

# ZU/DL-103 MK.II COPY + SPEC'S

**ZU AUDIO ZU/DL-103 Mk.II [REV-B] PHONOGRAPH PICKUP CARTRIDGE**

| | |
|---|---|
| **Design** | Based on the legendary Denon DL-103, with machined body, epoxy-matrix bonded motor/housing assembly, increased weight and machined directly into body EIA standard two hole mounting. |
| **Tolerance Explained** | Denon's factory tolerance between left/right output voltage and internal coil impedance is ≤ 6.0% as observed by Zu. Cartridges that do not measure 2.5% or better are either reworked, used for R&D or resold as stock Denon. This ensures that the Zu/DL-103 Mk.II pickups are the cream of the crop. Those that are after the tightest of tolerances, effecting stereophony performance much more so than tone, will be happy to know Zu performs tests and measure at various stages, with extensive final testing, and then grades them. Tolerance is measured between left and right internal impedance from 20 to 20,000Hz, full bandwidth phase, full bandwidth time-domain, and full bandwidth output curves. Tolerance spec' is not an average of measures but accounts for the lowest of any measurement, thus giving a true tolerance perspective. Final grade is referenced to serial number, marked on the tests and measures sheet, and the box label. |
| **Production** | Mk.II [Rev-B] 8/2014 – current. [Mk.II-A, 7/2013 – 8/2014. Mk.I-A, 2007 – 2013] |
| **Design** | Rigid body, semi-naked, moving coil 2-channel stereophonic phonograph pickup. |
| **Bandwidth** | 15 Hz – 45 kHz |
| **Output** | 0.3 mV |
| **Impedance** | 45 Ω [+5 Ω / –5 Ω] see measures for your specific pickup. |
| **Compliance** | 5 cu [5 x 10 –6 cm / dyne] |
| **Stylus** | 0.2 mm square base diamond, crystal aligned, conical cut [one big reason this pickup sings]. |
| **Tolerance Between Channels** | Standard ≤ 2.5% \| Grade 1 ≤ 1.0% \| Grade 2 ≤ 0.5% \| Grade 2 PRIME ≤ 0.1% |
| **Weight** | 14 grams |
| **Included Screws** | M2.5 x 8mm stainless with 4.5 mm slotted cheese head |
| **Mount** | Standard EIA universal tonearm with M2.5 x 11mm deep taps in body |
| **Mount To Stylus Vertical Height** | 0.585" [14.8mm] |
| **Stylus Underhang** | 0.01" [0.25mm] |
| **Stylus Pressure** | 2.5 grams @ 70ºF [21ºC] for wide dynamic range media. |
| **Recommended Resistive Load** | 200 – 300 Ω, or as needed to get the phono preamp to mate well and make you happy. |
| **Country Of Origin** | Armature is from Japan; body and remanufacture is from Ogden, Utah, United States. |
| **Satisfaction Guarantee** | 60-day unless the cantilever or internal leads are damaged. |
| **Warranty** | 2-year limited, does not cover damaged cantilevers or broken internal lead wires. |



# ZU/DL-103 MK.II WARRANTY

**ZU AUDIO ZU/DL-103 Mk.II [REV-A] PHONOGRAPH PICKUP CARTRIDGE**

## WARRANTY

DO NOT USE BRUSH WITH NAP LONGER THAN 1/8" [3MM]. USE OF BRUSH WITH LONGER NAP MAY PERMANENTLY DAMAGE YOUR PICKUP BY BREAKING INTERNAL LEADS WHICH IS NOT COVERED UNDER WARRANTY.

Zu products are designed and manufactured to the highest quality. However, if something does go wrong Zu will fix or replace the product free of charge. Zu/DL-103 Mk.II pickups have a two year limited warranty from date of purchase to original owner. If under normal home use you have any problems we will fix or replace the product.

What is not covered by the warranty is broken leads and broken cantilevers. Broken leads, no sound in one or both channels being the symptom, is nearly always the result of cleaning your stylus with a brush with nap that is long enough to enter the pickups motor, or dusting/cleaning the pickup with high pressure compressed air.

Warranty does not apply to damage caused by operating the product outside the intended use (if you are using it for a science project or a paper weight know that you are likely going to break it and we aren't going to fix it) or from accident, another product such as a phono preamp going sideways and feeding back into the pickup, misuse, abuse, flood, fire, earthquake or any other external causes. Warranty does not cover damage caused by modification or service performed by anyone other than Zu. Also, no serial number, no warranty.

When a product or part is exchanged the replacement becomes your property and the suspect or damaged part becomes Zu's property. Parts provided by Zu must be used in products for which the warranty service is claimed.

## WHAT YOU CAN EXPECT IF WARRANTY SERVICE IS NEEDED

If warranty becomes necessary, you must call or email for a return of material authorization (R.M.A.) number. This provides opportunity to assist in diagnosing the problem and helps us to schedule for rapid turnaround in the event that parts, service or repair is needed. Upon factory inspection of parts or product, warranty eligibility will be determined. While service options, parts availability and response times will vary, we do our best to keep you happy. International customers should know that Zu will comply with all applicable export / import laws and regulations, you may be responsible for custom duties, taxes, broker fees, freight, and other charges. When shipping of product or part is required, repackage the complete product, or part, in its original packaging. If you have any questions about packaging please call or email. Product damage caused from incorrect repackaging is not eligible for refund or warranty and the freight company may (should) also reject your insurance claim. Until we have the product back in the shop and sign-off that it is eligible, the product is still your property, we recommend you insure or declare the full value when shipping. We also recommend that you only ship with a freight company that has a good reputation and offers tracking and insurance for the full amount.

**ZU AUDIO**
Ogden Commercial Industrial Park
3350 S. 1500 W.
OGDEN, UTAH — U.S.A.

[DESIGNED AND MADE BY US]