



# ZU/DL-103 SPEC'S & TIPS

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

**WARNING:** THE ZU/DL-103 PICKUP IS NAKED AND EXPOSED, ONLY CLEAN STYLUS WITH A SHORT NAP STYLUS BRUSH—USING A BRUSH WITH A LONG NAP (HAIR LENGTH THAT'S LONG ENOUGH TO ENTER THE COILS) CAN BREAK THE INTERNAL LEADS.

Lots of good stuff to use: Needle Nectar, Musical Surroundings, LAST, Mo-Fi, Mr. Clean Magic Eraser (killer) and yes, 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 and coils. The Zu/DL-103 is a high performance 2-channel stereo moving coil phonograph pickup. The motor and it's design were developed by



Denon in collaboration with the Broadcasting Corporation Technical Research Laboratories back in the early 1960s. Design objectives for the original Denon assembly called for the creation of a new broadcast standard, for high-performance, high-consistency, high-reliability. The Zu/DL-103 consists of that original motor, still manufactured by Denon in Japan, then modified and placed in a machined from Alcoa alloy 6061-T6. This assembly is then bound and cast as a voidless unit. The Zu/DL-103 was a two year researched and developed project that began November 2005. Zu would like to acknowledge Phil Ressler for his significant contribution to this project.

**WARNING:** the Zu/DL-103 has an exposed stylus and cantilever, extra care must be taken in the mounting and operation to avoid breaking. Broken cantilevers are not covered under warranty, nor are broken signal wires (the result of using a long-hair brush).

**WARNING:** do not solder to the pickup's lead pins. Do not expose the pickup to temperatures greater than 200 °F (93 °C).

**NOTE:** if you are using a vintage table that has a lot of ferrous parts, or have a platter that has been filled with iron or other ferrous material, the magnetic attraction of the motor to the table may increase stylus pressure.

The Zu/DL-103 is built to fall within EIA dimensions and can be mounted on any commercially available universal tonearm built to EIA standards. The Zu/DL-103 weighs 14 grams, please consult with the tonearm manufacturer if there is a question of weight compatibility. In some cases such as Rega tonearms, a "heavy weight" counterweight may need to be fitted to the tonearm.

**ALIGNMENT** (For those that want the absolute in alignment we recommend evaluating angles and dimensions from the stylus.)

## VERTICALLY LEVEL YOUR ZU / DL-103

As the Zu/DL-103 is naked, we recommend you set your VTA (vertical tracking height) of your arm, or at least get it in the ball park, prior to installation of the pickup. This pickup should sound best on a level tonearm (or rather the pickup's stylus should be orthogonally positioned to the record) parallel if you are looking at the horizontal planes. You can get close by adjusting the distance between the top surface of the type of vinyl played most, to the bottom side of the EIA tonearm mount, roughly 0.60" of an inch [15 mm] and then adjusting the VTA of the arm to be level with this point. You can easily verify that you are running a level pickup when the reflection in the record of the Zu/DL-103 is orthogonally mirrored; so there is no perspective difference or angle shift between the reflection and the actual pickup. The Zu/DL-103 features right angles so this should be pretty easy work.

## PICKUP / TONEARM ALIGNMENT

To ensure the lowest tracking error, please follow the alignment method outlined by the tonearm manufacturer. The body of the Zu/DL-103 is completely straight and at right angles to aid in the alignment of the stylus and arm. The stylus of the Zu/DL-103 sits roughly 0.06" behind the pickup face edge [-1.6mm].

## STYLUS PRESSURE (DOWN FORCE) ADJUSTMENT

Please follow your tonearm manufacturers recommended procedure for setting stylus pressure. We recommend 2.5 grams of stylus force for normal conditions. Reduce stylus pressure to roughly 2.2 grams when the ambient in-room temperature is 85 °F [30 °C]. Increase stylus pressure to 2.7 grams when the ambient in-room temperature is 60 °F [16 °C].

## ZU/DL-103 PHONO PREAMP MATCHING

The nominal output voltage of the Zu/DL-103 is 0.3mV and the nominal internal impedance per channel is about 45 ohms. We recommend running a step-up transformer for moving magnet phono preamps. A step-up transformer is not required for phono preamps that have a moving coil (MC) setting, setting your impedance between 80 – 200 ohms. Even so, you should consider a Bob's Devices 1131 or similar.



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<b>Design</b>	Based on the legendary Denon DL-103, with machined body, dual compound epoxy potted motor assembly and body, increased weight and machined directly into body EIA standard two hole mounting.
<b>Tolerance Explained</b>	Denon's factory tolerance between left/right output voltage and internal coil impedance is $\leq 6.0\%$ as tested 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 branded DL-103 pickups are the cream of the crop. Those that are after the tightest of tolerances will be happy to know that in remanufacturing Zu performs tests and measure it at various stages, and in final testing Zu measures and grades them. Tolerance is measured between left and right internal impedance and output voltage. Tolerance spec' is not an average of measures but accounts for the lowest of any measurement, thus giving a true tolerance perspective. Tolerance measures are referenced to serial numbers and are graded and indicated on the label.
<b>Version</b>	Mk.I [Rev-A]
<b>Production</b>	2007 – 2013
<b>Design:</b>	rigid body, naked, moving coil stereo phono pickup
<b>Bandwidth:</b>	15 Hz – 45 kHz
<b>Output:</b>	0.3 mV
<b>Impedance:</b>	45 $\Omega$ (+5 $\Omega$ / -3 $\Omega$ )
<b>Compliance:</b>	5 cu (5x10 <sup>-6</sup> cm/dyne)
<b>Stylus:</b>	0.2 mm square base diamond, crystal aligned, conical cut
<b>Tolerance Between Channels:</b>	Standard $\leq 2.5\%$   Grade 1 $\leq 1.0\%$   Grade 2 $\leq 0.5\%$   Grade 2 Prime $\leq 0.1\%$
<b>Weight:</b>	14 grams
<b>Included Screws:</b>	2.5 mm x 8 mm stainless with 4.5 mm slotted cheese heads
<b>Mount:</b>	standard EIA universal tonearm with 2.5 mm x 11 mm deep taps in body
<b>Mount to stylus vertical height:</b>	0.60" [15 mm]
<b>Stylus Underhang:</b>	0.06" [1.6 mm]
<b>Stylus Pressure:</b>	2.5 grams @ 70 °F for wide dynamic range media
<b>Recommended Resistive Load:</b>	80 – 200 $\Omega$ , or as needed to get the phono pre to mate well
<b>Country Of Origin:</b>	armature, Japan; body and remanufacture, United States.
<b>Satisfaction Guarantee:</b>	60-day unless the cantilever or internal leads are damaged (if you break it you buy it).
<b>Warranty:</b>	2-year limited, does not cover damaged cantilevers or broken internal lead wires.

