

DECWARE



Zen Triode Phono Stage

Model ZP3

INTRODUCTION

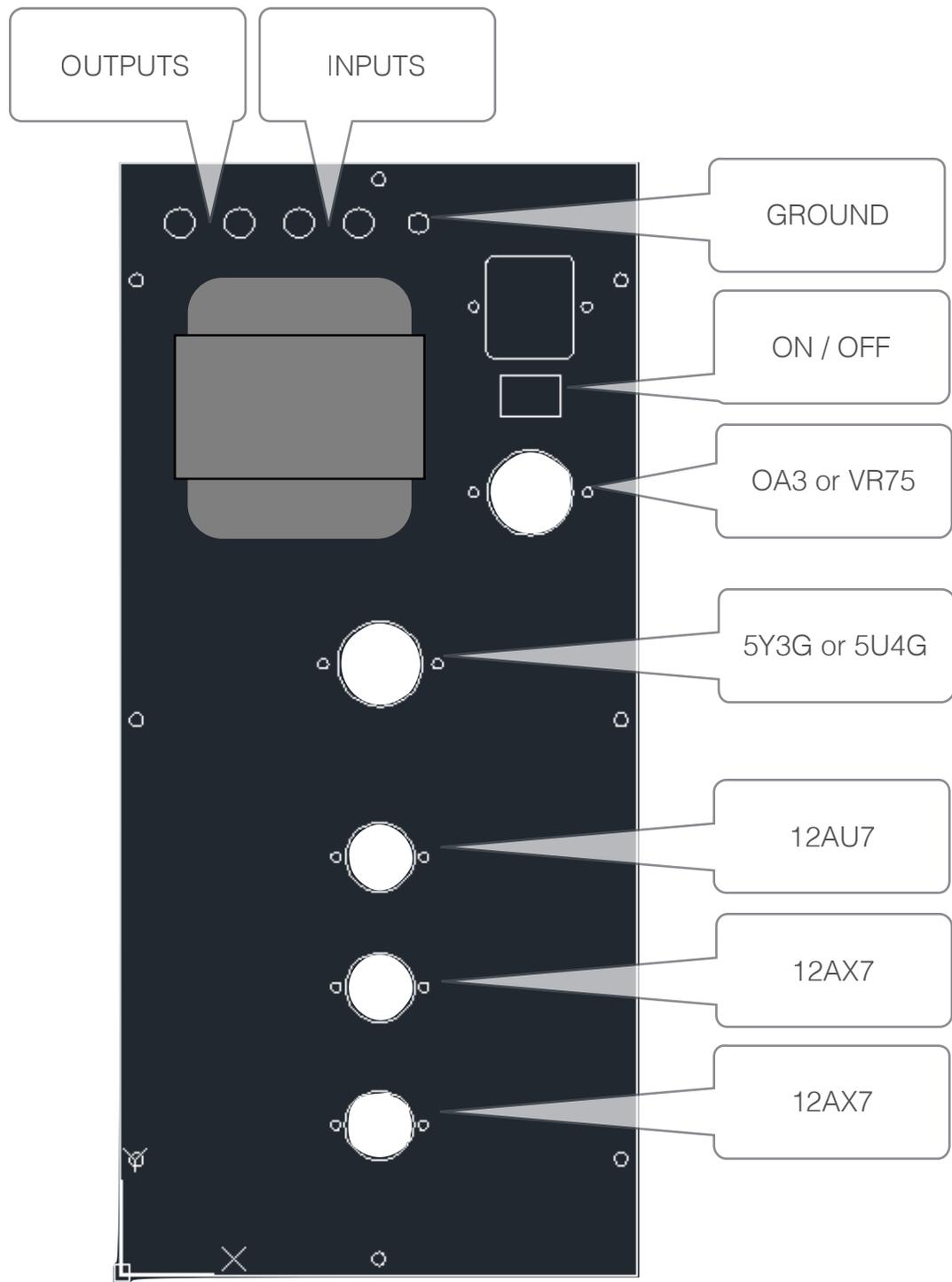
The Zen Triode Phono Stage is an all tube, single-ended design built using the popular 12AX7 dual triodes for amplification and equalization and a 12AU7 dual triode as a cathode follower to lower output impedance for better stability and drive.

Besides being comprised of all single-ended triodes, what makes the ZP3 desirable is the complete absence of negative feedback which is typically used to accomplish the RIAA equalization. Instead the ZP3 uses a passive RIAA network between the two 12AX7 gain stages. This approach gives a more open sound with a greater sense of depth.

Additionally, the ZP3 has a power supply over 500% larger than needed and with enough capacitance to easily power a 40 watt amplifier. This was done to eliminate voltage sag by brute force rather than using a smaller power supply and fancy solid state regulation which is the norm.

To take the power supply further, a vacuum glow tube is used in series with the supply to block harmonics and RF noise on your local power grid. The result is like having pure DC power from a battery. It is a superior method of cleaning power that does not rely on power regeneration which is often noisy (fans) and costs several thousands of dollars.

There are no solid state parts in a ZP3. Diodes, constant current source regulators, and so on have been deliberately omitted so that the artifacts of those devices do not poison the signature of circuit. A signature that has been painstakingly voiced and is completely unequaled in the market for anywhere near the price.



SIGNAL TUBES

The ZP3 is delivered with a factory tube compliment that is reference grade with hand selected and section matched 12AX7's for perfect channel balance.

When replacing the 12AX7's always specify tubes with matched sections. A 12AX7 is a dual triode where there are actually two individual triodes inside a single glass tube. These individual triodes are used for both channels which is a huge advantage in that it becomes impossible to have two different signatures between the two channels.

It is important that the signatures and characteristics perfectly match between the channels because that is what helps achieve a huge and well focused sound stage. Using 8 pin octal tubes, such as 6SN7's which is a popular alternative in many phono stages make it cumbersome to replace tubes since you have to find two that exactly match and then hope each tube wears at exactly the same pace, which they won't.

Since you can't ruin the imaging or sound stage of the ZP3 when rolling tubes like is possible with designs using separate tubes per channel, it makes it easy to experiment with different tubes. You'll find the differences between some tubes are not unlike the differences between cartridges.

If you're going to explore some "tube rolling" as we like to call it, you should begin with the front input tube (12AX7). This particular tube has the biggest effect on how your ZP3 sounds, and the biggest effect on noise as well. Getting a hand full of different 12AX7's and simply trying them one at a time in the front tube location can be a very interesting experience as you explore just how much and how each one can change the sound.

When changing tubes, be sure to turn the ZP3 off and wait at least 60 seconds before removing the tubes. Of course at the same time your turn off your ZP3 you want to make sure the volume on your amplifier or preamplifier is all the way down!

The ZP3 runs comparatively low voltages on the tubes which enhance tube life. Again this is outside the norm, but the lower voltages create better liquidity in the sound and more space and air. That said, the tubes should be replaced every couple years with regular use. It's a good idea to have a complete tube compliment on hand.

Every 6 months install the new tubes to see if there is any change in performance. If there is a noticeable improvement with the new tubes it means one or more of your other tubes is getting tired. If there is no difference, restore the original tubes and try again in another 6 months.

VOLTAGE REGULATOR TUBE

The OA3 tube is also known as a VR tube (Voltage Regulator) and is sometimes called a "glow tube" because of the rich way that it glows during operation. These tubes are what's called "New Old Stock" meaning that they are new tubes manufactured sometime in the 1950's ~ 1980's.

While no longer made, there are many still floating around on the planet. They can be found at your favorite tube suppliers, and on ebay.. Of course DECWARE will always have top grade and tested OA3 tubes on hand for our customers. There is little fear of running out of these tubes because few if any other manufactures use them. Decware tube gear is one of the precious few to use tube regulation in it's products.

The OA3 tube does not get hot in a ZP3 so it can be touched during operation. Since current passing through the tube is what "fires" it causing the glow you see, the tube make flicker on and off several times on start up, or on shut down, or on both. This is normal. Once this tube has a steady glow to it, high voltage is available to the audio circuit.

If you can not get an OA3 to glow it either means it is bad, or the rectifier tube has failed. Since the rectifier tube supplies the high voltage to the OA3, the OA3 can not glow unless the rectifier tube is working properly.

It takes an OA3 tube around 20 minutes to fully stabilize. This means that at around the 20 minute mark the sound of the ZP3 can elevate even further.

RECTIFIER TUBE

The ZP3 is usually shipped with a hand selected 5U4G rectifier tube. Alternately you may use a 5AR4 or a 5Y3GT with good results. The difference between a 5U4G and a 5YGT is a difference in high voltage of about 30 volts which is enough to effect the sound, so experimenting with different rectifier tubes can further refine the voicing of your ZP3.

TECH NOTE: The first capacitor the rectifier tube see's is a 47uf 500V

FIRST TIME SET UP RECOMMENDATION

When you get your ZP3 tubed up, and you have double checked that the each tube is in the correct location, you can connect it to your preamplifier or amplifier and turn it on. Do not hook up your tonearm wires to the ZP3 as of yet. It is important to get a baseline reference for noise and hum with the ZP3 just setting there idle and with no input signal cables connected. The typical noise and hum of the ZP3 is too low to hear on all but the highest sensitivity speakers. That said, what level you do hear can usually be made to go up or down with different tubes. Again, any of the three signal tubes can cause excessive hum or noise, as can a failing rectifier tube.

Once you are satisfied that all the tubes are hum and noise free you can connect your tonearm cables to the ZP3 and the ground wire from your turntable to the ground lug on the back of the ZP3. It is important to make sure your preamp or amplifier volume control is all the way down prior to connecting the tonearm cables. Once the cables are connected you can raise the volume back to where you had it and check for noise and hum again.

If you have excessive noise or hum from your tonearm cables check to be sure the ground on each channel is functional, and make sure the shield on each channel is functional. If you supply your own tonearm cables as is the case with some models of turntables, be sure the cables are fully shielded with a 95% braid.

Also keep transformers and similar things that broadcast AC fields away from your tonearm and cartridge and cables.

A ZP3 is one of the quietest tube phono stages on the market, with inky black backgrounds so if you set one up and are hearing hum from the listening chair, you can confident this is not normal and feel free to call us for help on troubleshooting your system.

MOVING MAGNET CARTRIDGES

The ZP3 is what is commonly referred to as a 47K moving magnet phono stage. Meaning by itself it is set up for the typical moving magnet phono cartridge with a 47K impedance.

The ideal output level for a moving magnet cartridge used with the ZP3 is 5 millivolts or higher when no preamp is used so that the output of the ZP3 equals that of a standard 2 volt CD player or DAC. If a preamp is used, cartridges with lower outputs can be explored.

Even when a preamp is used, we find that higher output cartridges give greater density and weight to the sound when paired with the ZP3.

MOVING COIL CARTRIDGES

A moving coil cartridge has up to 10 times lower output than a moving coil cartridge and requires a step up device to bring its output level up to that of a standard moving magnet cartridge. We find the best sounding way to achieve this is with a Step Up Transformer.

Decware makes three models of Step Up Transformers that cover the majority of phono cartridges on the market. The most common by far is our model ZMC-1.



The ZMC step up device, shown left, is simply connected between your tonearm cable and the phono stage. Use shielded cables for both the tonearm and between the ZMC and the phono stage. *(NOTE: if the cable of your tonearm is captive then it is shield).*

The power connector on the ZMC is not used except by some studios for special grounding considerations. The ZMC is a passive device and uses no power.

ZMC Step Up Transformer operation is somewhat unique. Rather than worry about having the right capacitors or resistors on the phono stage for moving coil cartridge loading, we have installed a knob that allows you to load the cartridge "on the fly" while you are listening to music. This way you can achieve ideal cartridge loading by ear. To use it simply turn the control all the way down until you hear no sound. Then slow raise it like a volume control until you reach the point in the rotation where the volume stops increasing. This is the ideal loading point. Then from that point (usually around 3/4 or higher) you can tweak the level above or below to effect changes in how your cartridge sounds.

One good use for this, is when you want to over damp your cartridge to take the ringing or sibilance out of the sound. For example, you might have your tone arm height (VTA) set perfectly for a thick 200 gram record, but you want to play one side of a skinny LP without having to go through the trouble of re-adjusting your VTA. So normally you just play the record, but being skinny, the angle of the tonearm drops and the cartridge no longer tracks perfectly resulting in a harshness in the top end. Lowering the VTA would fix this, but then as soon as the record is over you would have raise the VTA to the previous setting. With a ZMC, you can simply over damp the cartridge making is less resolute in the top end making the record listenable without the VTA adjustment.

An ideal output level from a moving coil cartridge used with a ZMC Step Up Transformer would be around 0.2 milivolts or higher.

Both the ZMC Step Up Transformer and the ZP3 have the ability to handle many times the voltage possible from any cartridge making higher output cartridges play with zero distortion and bone cracking dynamics.

GAIN

The ZP3 has apron 43dB of gain for use with moving magnet cartridges. The ZMC step up transformers add around 20dB for use with moving coil cartridges.

SPECIFICATIONS

Weight	13 lbs
Dimensions	8.5 inches high x 7.25 inches wide x 14.75 inches deep
Circuit type	Single-ended Class A Triode Passive RIAA
Gain	+42dB
Input Impedance	47K Ohms
Output Impedance	<1000 Ohms
Response	25 ~ 25kHz
Feedback	ZERO negative feedback
Rectification	5U4 / 5Y3GT / 5AR4
Signal Tubes	12AX7 (2) 12AU7 (1)
Consumption	65 watts
Input Jacks	RCA unbalanced
Output Jacks	RCA unbalanced

OPERATIONAL NOTES

The ZP3 can be expected to sound unusually good right out of the box despite having only a 24 hour burn-in cycle during the QC process. It will however sound it's best after a couple hundred hours of playing music, as that is about the time it takes for the internal parts, in particular the capacitors, to burn-in fully.

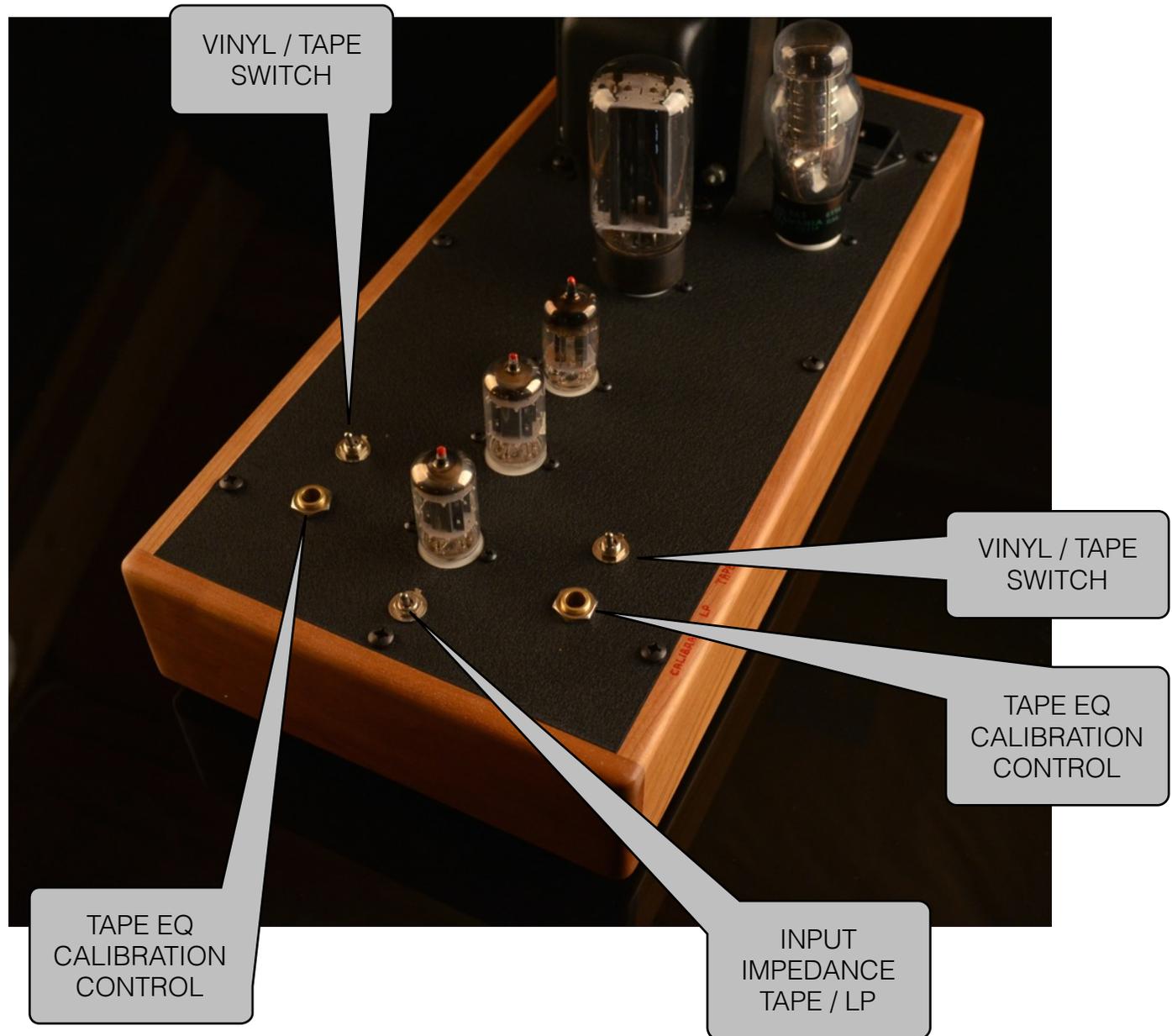
The tonearm cables will become more important to the resulting sound than ever before due to uncanny transparency of the ZP3. We highly recommend some experimentation if your tonearm can accept different cables. This can in some cases make as big a difference as changing cartridges.

Due to the lower voltages, reduced heat, and kindness to the tubes, it is no great crisis if the ZP3 is left on for long periods of time. We recommend you turn it off (as with all tube equipment) when you leave the house but the ZP3 can be left on for days at a time when you are home if so desired.

If you have a cartridge that falls somewhere in the middle or on the low side as far as output levels go, it is sometimes almost epic how much better the sound can get with the addition of a purist single tube gain stage like our model ZSTAGE. Simply install the ZSTAGE between the output of the ZP3 and your preamp or amplifier and hang on! What it does to the sound is not unlike what a blower does to a muscle car.

REEL TO REEL TAPE

The ZP3 can be ordered with the TAPE option allowing it to be used as a tape head amplifier for 7.5 and 15 IPS tape speeds with NAB or IEC equalization.



The Tape Equalization can be calibrated for each channel. The range of the calibration spans the difference between NAB and IEC curves so you can precisely calibrate the ZP3 for either one.

REEL TO REEL TAPE (cont.)

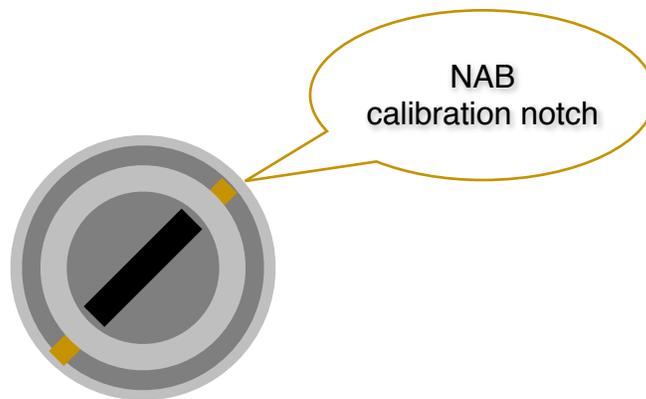
The Vinyl / Tape switches are set to 'vinyl' when they are switched toward the front as shown in the previous picture.

The Input Impedance switch is oriented the same way. Setting it toward is Vinyl while setting it towards the rear is Tape. It should be noted that you can operate the unit with this switch in either position when listening to tape. Sometimes setting this impedance switch to LP when listening to tape can add some sparkle in the top frequencies.

The Tape EQ calibration controls are factory set for NAB, and the control is marked. This control requires a small flat-blade screwdriver to be inserted in order to make adjustments. For IEC simply rotate the controls counter-clockwise until you like the high-frequency response of the tape you are listening to. Usually this is about 1/8th ~ 1/4 of a turn.

If you listen to a lot of tapes that are both NAB and IEC as well as some unknown tapes, you will find that adjusting these controls by ear until you get the high frequency response your after is much easier than it sounds.

Any time you want to go back to the factory NAB setting, you can just look at the calibration notches on the adjustment screw and line up with those.



The Tape EQ calibration is an infinitely adjustable potentiometer that can also be adjusted by ear making it possible to dial in the frequency balance on a tape by tape basis. This comes in very handy for improving tapes that sound a little "off".



By modifying your tape deck with a pair of RCA jacks that are wired directly to the playback head, you can use the ZP3 to elevate tape playback to an astonishing level. It is essential if you own a master tape and want to really hear it.