

*van den Hul*<sup>®</sup>

## **User Manual**

### **“The Grail”**

## **Phonograph Preamplifier**



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## INTRODUCTION

Congratulations with your purchase of the van den Hul “The Grail” !

With this product you are the owner of one of the most innovative and advanced phonograph preamplifier's available at the moment.

“The Grail” is a really dulcet phonograph preamplifier, specifically designed bearing ultimate performance and reliability in mind.

### Featurelist:

- a specific designed Phonograph preamplifier section, unique in the world
- Phonograph RIAA - equalization with *coils only*, no sound impairing capacitors in filters
- special printed circuit board material with gold conducting paths
- the printed circuit board has a special seating to evade microphonics
- special equipment foot made of selected wood avoids mechanical energy storage
- low noise moving coil input stage, no annoying noise even with low-output cartridges
- automatic adapting input stage for moving coil cartridges, no matching resistors needed
- possibility to compensate phonograph cartridge sensivity (level adjustment)
- cut out of coupling capacitors in the signal path as far as possible
- strictly separated amplifier sections and circuit layout deliver a very natural soundstage
- inputs: two phonograph inputs, one for MC cartridges, one for MD or MC high-output
- a shielded transformer is placed in an external housing to avoid hum and EMI noise
- power supply with Gytrators for each amplifier stage deliver very high noise cancellation
- the external transformer is available for different mains voltages

Designed to provide high-end audio, “The Grail” will deliver you outstanding sound quality with nearly every available modern phonograph cartridge.

## SAFETY PRECAUTIONS

Use The Grail phonograph preamplifier only for the designated application range it was intended for.

If the mains power cable or the external transformer housing is damaged and/or inner wires can be touched, do not touch these cables and do not use the preamplifier! ***Touching wires connected to mains live will harm your health seriously!*** In case of this kind of damage, do not touch the preamplifier or its transformer box and unplug the mains plug immediately. Bring the preamplifier to an authorized service point for repair.

To avoid risk of fire or electrical shock: do not use the preamplifier and its external transformer in rooms with high humidity or in other wet environments. It may be used in dry places only. If any kind of fluids ( water, drinks, soapsuds etc.) runs into the external transformer housing or into the preamplifier, please unplug the mains plug immediately and bring the preamplifier to an authorized service point for inspection.

Do not allow children to play with the preamplifier and do not let them use it without your supervision. Keep the preamplifier out of the reach of pets.

Keep away the preamplifier from hot surfaces and from open fire. Don't use it on top of another audio system parts that emits heat.

# INSTALLATION AND USE

## Overview of the device:



Front side: 1) Power on indicator (red Led)



Rear side:

- 1) Toggle switch MM / MC input selection
- 2) Ground connector for turntable ground signal (tonearm, motor-base etc.)
- 3) MC phonograph cartridge input (low/medium output level MC system )
- 4) MM phonograph cartridge input (also for high level output MC systems )
- 5) Connector for input load of MM input ( for load resistor / load capacitor )
- 6) Preamplifier output connectors, left and right channel
- 7) Power supply connector, to connect with external transformer  
( use no other transformer then the dedicated one for “The Grail” )



Transformer box:

- 1) Power switch for mains power
- 2) Fuse holder (Fuse: 800mA slow acting for 230V version)
- 3) Mains power connector for standardized IEC power connector
- 4) Power supply connector, connect to “The Grail” preamplifier

### **Connection of the preamplifier:**

Some words in front: “The Grail” is a high quality preamplifier that delivers you the finest possible sound. But it can do this only if you use the right cables – using cheap, bad sounding cables will seriously degrade the sonic benefits you can get from “The Grail”. Save your investment - use the best cables you can afford, e.g. cables from the van den Hul cable line. They will deliver you the best possible sound available at this moment.

### **Power supply:**

Be sure the main switch of the transformer box is in position 'off' ( symbol “o”)

Connect the transformer mains power connector with the power cable to your mains wall plug.

Take care: two versions are available, one for 115Volts and one for 230Volts. Be sure it matches to your mains voltage.

Now connect the round-shaped low voltage connector sitting at the end of the gray cable coming from the transformer box to the preamplifier's rear side ( item No.7 of the picture of the rear side of the preamplifier)

### **Audio signal connections:**

Connect your high-level (control) preamplifier with a pair of high quality cables with RCA-phonoplug (Cinch) connectors with the phonograph preamplifier “The Grail”. The connectors at the rear side of “The Grail” are named “Out”, connect them to a free high-level input of your control amplifier, e.g. “Aux” or “Line”.

Connect the cables coming from your turntable either with the input connectors “MC” or “MM” of “The Grail”. These are item No.3 or No.4 of the picture of the rear side of the preamplifier.

Also connect the common ground cable to the ground/earth connector of “The Grail” (item No.2 of the picture of the rear side of the preamplifier). If you have more ground cables, e.g. coming from your system rack, connect them to this ground connector as well.

Put the switch “MM/MC” (item No.1 of the picture of the rear side of the preamplifier) to the direction named same as your chosen input. *Caution: turn volume to minimum before switching.*

**Attention:** please turn your volume control (level potentiometer) on frontside of your control amplifier to the left side (“position quiet”). Now switch on your preamplifier “The Grail” with the switch on the rear side of the transformer box. It will take about 15seconds and “The Grail” releases the output signal. During this time all internal bias points are stable and the preamplifier is ready for listening.

That's it! Put a record on your turntable, choose the desired volume and **enjoy the music!**

## Choosing the right input / Impedance matching

Because of you have two inputs at the rear side of “The Grail” you have the choice between them – but which one to take ?

There are various phonograph cartridges on the market. Roughly said, they divide into two groups:

- 1) Moving coil (MC) cartridges  
and
- 2) Moving magnet (MM) cartridges - to this group belongs also the “moving iron” (MI) systems

MC cartridges again divide into two groups:

- a) low-output types  
and
- b) high-output types

Examples:

a representative of the species b) is e.g. van den Hul “Grasshopper III-CHA” with 2.25mV/cm output voltage -

and a representative of the species a) is e.g. the van den Hul “Grasshopper III-GLA” with 0.6mV/cm output voltage or the van den Hul “The Colibri XCP” with 0.4mV/cm output voltage.

### **In practise:**

for the high-output MC systems please use “The Grail's” input “MM”. Why? Now, this input is more then only a plain MM system input – it is also dedicated to “high-output” MC systems. This way you avoid any overdrive of your preamplifier's input.

If you have a low-output MC system please use “The Grail's” input “MC”. It was especially designed for low and medium output MC systems. *And this input has a remarkable feature: it matches the input impedance for your MC cartridge automatically.*

**Simply connect your low or medium output voltage MC system to “The Grail's ” MC input and forget about impedance matching and all the rest – just enjoy the music !**

**Impedance matching for high-output MC systems connected to the “MM” input**  
*These lines are dedicated to the skilled users only – if in doubt, always consult your dealer!*

Impedance matching is easy done: stick to the cartridge manufacturers recommendation for your cartridge. If it says “*recommended input impedance is 470 Ohms*” for your high output MC system use a high-quality(!) 470 Ohm resistor and solder it into a male Cinch connector. Make two identical of them – because of you are listening to stereo sound and that means two channels.

Place these two prepared Cinch connectors to the connectors “Load” at the rear side of “The Grail” ( item No.5 of the picture of the rear side of the preamplifier ). You're done.

## **Impedance matching for MM and MI systems connected to the “MM” input**

*These lines are dedicated to the skilled users only – if in doubt, always consult your dealer!*

What about the impedance matching of MM or MI systems? *Normally, everything should be fine.* “The Grail’s” input impedance is 47Kilo-Ohms (47000 Ohms), this is the standardized value for MM/MI cartridge inputs. Just connect your cartridge and enjoy the music!

In very few cases the the input capacitance of the combination “ *turntable signal cable + preamplifier input* ” is not high enough. As mentioned, this is rather uncommon. Normally the input capacitance is just right or slightly too high (if way too high, use a better and shorter cable, ask your dealer!). But in case the input capacitance is too low, you may get an aggressive and too “bright” sound.

How to get rid of it?

You can do the same as with the matching of the high output MC system – but this time you use no resistors but instead high-quality(!) capacitors like Polystyrene type capacitors and solder them into the male Cinch connectors. Reasonable capacitor values may vary from 47pF up to 330pF (“pF” means “PicoFarad”).

Hint:

Keep in mind that your cable has an inherently capacity and the input of “The Grail” has also a 50pF input capacitance. So you only have to add the missing part of the recommended total capacitance, given by the cartridge manufacturer.

### **In practice:**

Let's say the recommend capacitance for your MM cartridge is 470pF. Your cable from turntable to “The Grail” preamplifier has a 90pF each meter and you just have one meter of this cable, you get a total capacitance of :

- a) cable capacitance: 90pF
- b) “The Grails” input capacitance at the “MM” input: 50pF  
Result:  $100\text{pF} + 50\text{pF} = 140\text{pF}$
- c) Missing value:  $470\text{pF} - 140\text{pF} = 330\text{pF}$

Commercially available is a Polystyrene capacitor of 330pF. For example, take this one and solder it into a suitable Cinch connector. *Normally it is a good advise to take the lower end of the recommended capacitance range:* also commercially available is a Polystyrene capacitor of 270pF. Maybe you want to go for this one instead of the 330pF ...

Finally, place two of these prepared Cinch connectors with the additional capacitors inside to the “Load” connectors on the rear side of “The Grail”. That's it, input capacitance matching for your MM/MI cartridge is done.

## Level matching

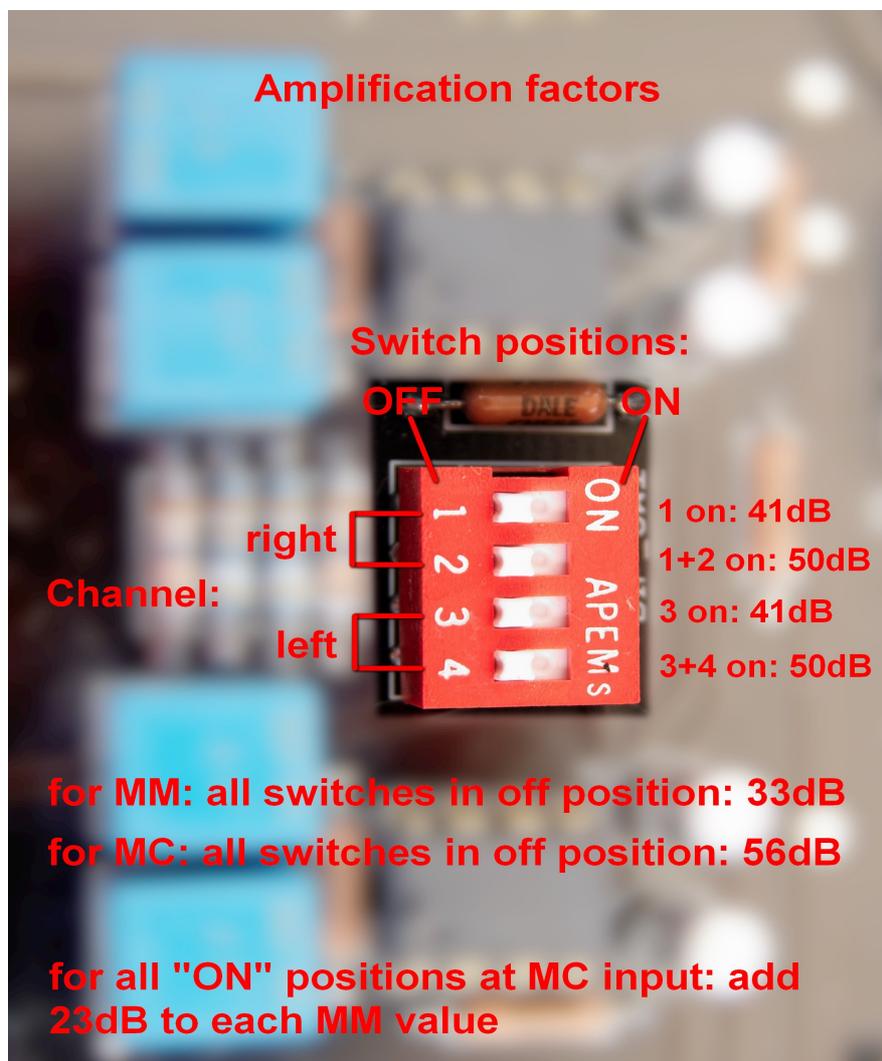
To compensate the various level differences between all your audio sources, “The Grail” gives you the possibility to change the amplification factor.

This amplification factor variation is also meaningful, if you use a quite “super-low” output voltage MC cartridge, or your high output voltage MC system is just at the “low side” of it's kind and you would like to use it at the MM input of “The Grail”.

Also conceivable: your complete audio chain has a quite low amplification factor and you use speakers with low sensitivity.

In all this cases it is meaningful to adjust the amplification factor of your phonograph preamplifier.

With “The Grail” this is easy done. Simply remove the four cross-recess screws of it's top plate. Remove the top plate and take a look inside of the preamplifier: you will find 4 small switches, in form of a single DIP-switch. (DIP = Dual Inline Plug). Please take a look at the picture below, it shows the mentioned DIP switch (color of the switch may be red or blue in your amplifier):



Switch No.1 and No.2 belong to the right channel and switch No.3 and No.4 belong to the left channel. Default position (delivery condition) is: all switches in position “off”. That means, the basic amplification factor is for **MC input : 56dB** and for **MM input: 33dB**. Simply choose the desired amplification factor by pushing the respecting levers to the “on” position.

Basically: the higher the “dB” figure, the higher the amplification factor and as a result the louder the music signals will be.

*Don't overdo: choose only an amplification factor that is really necessary.* Taking amplification factors much higher than necessary will result in a reduced overdriving capability (headroom) of the preamplifier. This may result in a harsh, kind of distorted sound in the loudest music passages.

Some final hints:

As all electronic audio devices, “The Grail” has a pre-aging period when bought as a brand new device. Normally this ends after 50...100 hours of listening to music. During this time the sonic quality raises to its maximum.

As well, if the preamplifier is cold (was switched off for some hours), it takes some time to be on the height of maximum sonic performance. After approx. one up to two hours of warm-up time the maximum is reached. Because of the low power consumption of “The Grail” of only a 7Watts you may want to keep it always on. This delivers you the best sound anytime you would like to enjoy your music. But, e.g. if you have a holiday and you leave your house for days, switch off your preamplifier (as well as the rest of your audio chain). In case of a holiday trip you switch off your cooking plate too, don't you ?

## PROBLEM SOLVING

In case of a malfunction, take a look at some things:

- 1) The power switch of “The Grail” is in “on” position? Is the proper mains voltage available? Are all other amplifiers switched on (control amplifier, power amplifier)? Is the corresponding input channel of the control amplifier chosen ? Volume knob is not at the left latch?
- 2) Is the wiring of all components in the audio chain correct? No “fallen off” connectors?
- 3) Is the fuse in the transformer box of “The Grail” blown up? You can open the fuse holder ( item No.2 of the picture of the rear side of the external transformer box ) and take out the fuse. If it is blown, replace it with a fuse of the same kind and value. **Fuse type: 800mA slow acting, size 5x20mm.** If this fuse blows up again, please unplug the mains plug and bring the preamplifier to an authorized service point for repair.
- 4) Are the two fuses in the preamplifier “The Grail” blown up? You can open the preamplifier housing by removing the four cross-recess screws of it's top plate. Remove the top plate. The fuses are located in the upper right corner, near the power supply connector ( item No.7 of the picture of the rear side of the preamplifier). Take out the fuses and look if they are blown. If so, replace them with fuses of the same kind and value. **Fuse type: 2pcs. 1.25A slow acting, size 5x20mm.** If these fuses blow up again, please unplug the mains plug and bring the preamplifier to an authorized service point for repair.

## TECHNICAL SPECIFICATIONS

Mains power:	available with 115Volts or 230Volts, 50/60Hz.
Power consumption:	7 Watts
Temperature operating range:	from 15deg. Celsius up to 30deg. Celsius room temperature. No condensing on item allowed Use only in dry rooms
Max. undistorted output voltage:	25V <sub>ss</sub> (Accumulator driven version: 19V <sub>ss</sub> )
Output impedance:	330 Ohms (real resistive)
Input sensitivity values:	( given for 250mV RMS resp. 0,707V <sub>ss</sub> output level on amplifier output)
MM input:	
Amplification factor 33dB:	5,6 mV
Amplification factor 41dB:	2,2 mV
Amplification factor 50dB:	0,8 mV
Input impedance:	47KOhm / 50pF
MC input:	
Amplification factor 56dB:	0,4 mV
Amplification factor 64dB:	0,15 mV
Amplification factor 73dB:	0,05 mV
Input impedance:	autom. matching from appr. 40 Ohms up to 400 Ohms

# WARRANTY