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### Mission Statement

Rega's philosophy is to make high quality products at sensible prices, as a means of reproducing music as faithfully as possible. Rega is committed to the design and development of new and existing products, both in hi-fi and other areas, that will perpetuate Rega's values of quality and value for money.

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## Introduction

The function of a phono pre amplifier is to match the output from a pick up cartridge to the input of a line level amplifier. It is required to amplify the very low signals produced by the cartridge and also to equalise the in accordance with RIAA record cutting standard.

Rega believes that moving coil and moving magnet cartridges require different types of phono pre amplifiers to achieve optimum performance.

The **ios** is therefore dedicated to moving coil cartridges and avoids compromises.

We have avoided including any superfluous gadgets as they obstruct the signal path and degrade the sound quality.

The **ios** phono pre-amp incorporates remarkable and innovative design ideas. For those interested in the technical details, these innovations are described more fully in the next section of this manual.

Alternatively, you can simply switch on, sit back and let your **ios** speak for itself.

**Please Note: Read this manual with care** - failure to do so may result in operational difficulties not covered by any warranty.

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## Design Innovation

The Rega **Ios** is a four stage all symmetrical amplifier. To provide optimum performance it is dedicated to amplifying the very low level signals that are generated by moving coil cartridges.

The first stage uses a 1:10 step-up transformer, which can be optimised to the cartridge by the selection of the correct loading and zobel DC resistance correction network connected across the MC transformer secondary.

The second stage is symmetrical compound pair class A amplifier, using paralleled low noise Hitachi transistors in the input stage. This drives the passive high frequency part of the RIAA equalisation stage.

The third stage is a symmetrical class A differential amplifier with a common base driver stage; this is also used as the active amplifier in the low frequency part of the RIAA equalisation stage.

The fourth stage is the active filter, this configuration uses the same circuit as found in the second stage. The filter element uses a very high bandwidth operational amplifier gyrator as the simulated inductance part of the tuned filter.

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The power supply is a symmetrical discrete tracking power supply using fast diodes and a low noise voltage reference. Each stage has its own localised power supply, and LED referenced current generators.

Very high quality, polypropylene capacitors have been used in the signal path. 1% tolerance polypropylene capacitors are used in the RIAA EQ stages and audio grade capacitors are used in the rest of the circuit.

### Installation

**ios** will work well on most surfaces, such as a shelf or a table, provided there is sufficient air around it to prevent overheating.

To avoid any possible magnetic interference and increased hum levels, site the **ios** as far away from the turntable as the tonearm lead will allow. If possible, try to place **ios** to the left of the turntable. Ideally the equipment should be placed next to one another in a line (**ios** to the right). This keeps **ios's** most delicate electronics away from other transformers.

Try not to stack other Hi-Fi components, (tuners, cassette decks, power amps or CD players), on top of, or underneath **ios**. If this is unavoidable, use an equipment stand.

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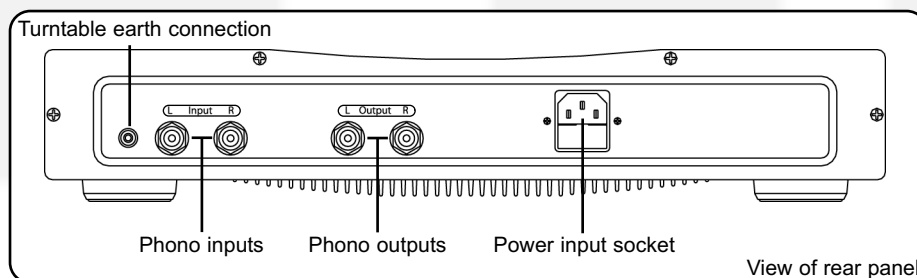
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## Ventilation

The heat produced by the amplifier, although minimal, is dispersed to the air by the case, particularly the underside. Ensure that the case has an uninterrupted air passage around it.

## Connections

The inputs and outputs are made via RCA (phono) type connectors. The input and output sockets are marked by colour to indicate left and right channels, **Black** for **LEFT** and **Red** for **RIGHT**.



If your turntable has a separate Earth wire, firmly connect it to the terminal provided on the rear panel. (see illustration above)

NB. Always switch both pre and power amps off before changing the leads.

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## Earthing

The **Ios** uses a Class I earth system, where the case metal work and earth screen between the primary and secondary windings in the toroidal transformer, are connected to the line safety earth, by means of the mains lead.

The internal signal earth is linked to this earth by the use of a network to eliminate the risk of earth/ground loops.

This earthing method provides a safe and efficient discharge path for any static charge generated by the cartridge.

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## Cartridge selection

The **ios** phono pre amplifier is not suitable for use with any Moving Magnet (MM) cartridges, it can only be used with moving coil (MC) cartridges.

The **ios** has been designed to work with most manufacturers moving coil (MC) cartridges.

There are five different input load settings, select the required load to match to that specified by the cartridge manufacturer.

The ios has five different DC resistance settings 1-5.  
Note: It is permissible to try different loading conditions and resistance settings as sometimes changing the load gives a different sonic performance more suited to your personal taste.

These variables are explained in greater detail in the controls section of this manual.

Your Rega dealer will be able to give guidance to help match your specific cartridge to the correct gain settings.

## Powering Up

**ios** is activated by depressing the On/Off button situated to the left of the control panel. The power indicator LED will glow steadily.

Always activate **ios** before the power amplifiers and deactivate after they have been switched off.

After switching off, the indicator will extinguish.

Due to the nature of the circuit topology, there is a short period immediately after switching on when the quiescent current has not stabilised. This condition results in reduced output from the pre-amp.

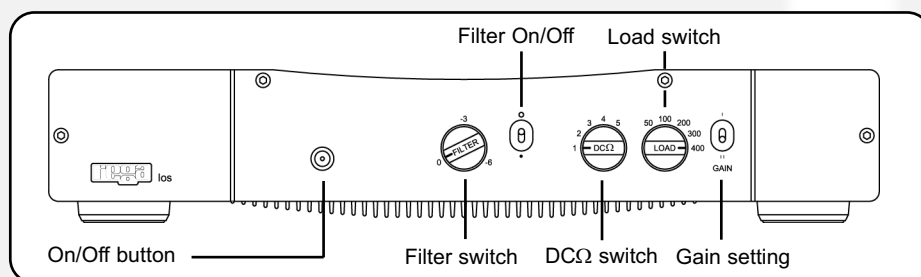
This Rega amplifier circuit has been carefully designed to work with a minimal “warm up” period. Some manufacturers and retailers may recommend leaving amplifiers permanently switched on, Rega cannot condone such practise in these environmentally sensitive times.

We would recommend that your Rega amplifier is always switched off after use. Full sound quality is attained after less than ten minutes (a process speeded up by playing music!)

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## Controls



## The Load Switch

The DC resistance of the cartridge affects the transient or square wave response of the transformer; this network has to be optimised to get the best out of the cartridge and transformer combination.

There are five different input load settings of **50, 100, 150, 300 & 400Ω**. Select the required load to match to that specified by the manufacturer in the cartridge specifications. It is permissible to try different loading conditions as sometimes changing the load gives a different sonic performance more suited to your personal taste.

The **100Ω** setting is optimised for the Rega Apheta cartridge.

## The DC $\Omega$ Resistance Switch

Setting 1 - nominal	<b>6.25<math>\Omega</math></b>	(5 to 7.5 $\Omega$ )
Setting 2 - nominal	<b>8.75<math>\Omega</math></b>	(7.5 to 10 $\Omega$ )
Setting 3 - nominal	<b>11.25<math>\Omega</math></b>	(10 to 12.5 $\Omega$ )
Setting 4 - nominal	<b>13.5<math>\Omega</math></b>	(12.5 to 15 $\Omega$ )
Setting 5 - nominal	<b>15<math>\Omega</math></b>	(15 $\Omega$ )

Select the switch for the nearest DC resistance of the cartridge this information is usually found in the cartridge specifications, if your cartridge falls in-between two settings, try both settings and choose the one that gives the best sonic results. It is permissible to try different DC resistance conditions as sometimes changing this condition gives a different sonic performance more suited to your personal taste.

The **15 $\Omega$**  setting is optimised for the Rega Apheta cartridge.

## The Gain setting switch

The gain setting switch selects the voltage gain of the phono amplifier. Gain I selects 70dB (switch up) and gain II selects 64dB (switch down), this will provide an input sensitivity of 61 $\mu$ V and 118 $\mu$ V respectively for an output level of 200mV. It is advisable to start with the lower gain setting II, and if necessary, increase the gain level to I if more level is required for lower output cartridges. Please note mute or turn the volume control to minimum when changing the gain setting.

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## The Filter control

The filter is designed to enhance the Apheta cartridge by reducing unwanted high frequency energy present. The level is continuously variable from 0db to  $-6.5\text{dB}$  at a frequency and 'Q' chosen to match that of the Apheta cartridge.

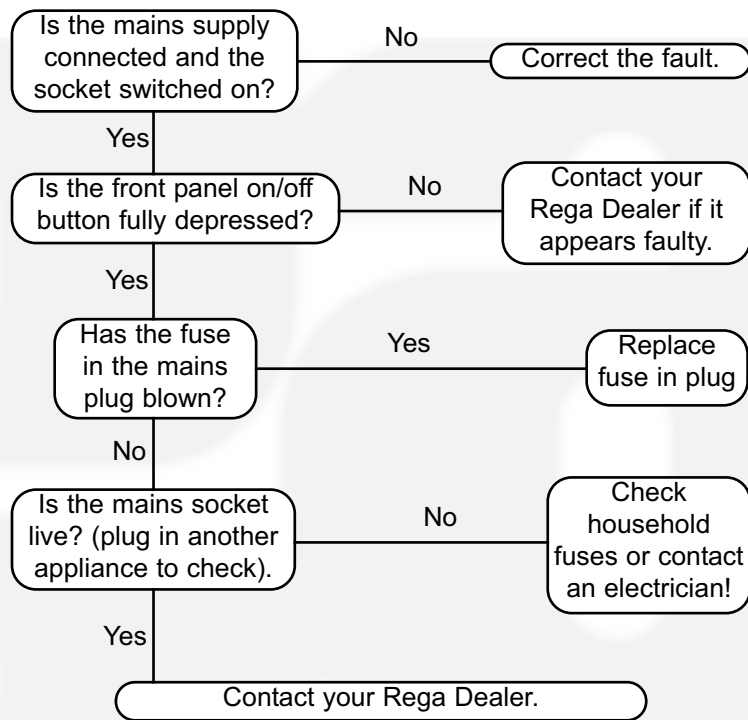
As a rough guide the filter is useful with older (early 1960's) pressings with higher than normal surface noise, typical position being roughly 1 o'clock. Later and newer recordings may not need this filter.

When the filter switch is in the off position the filter is completely removed from the signal path.

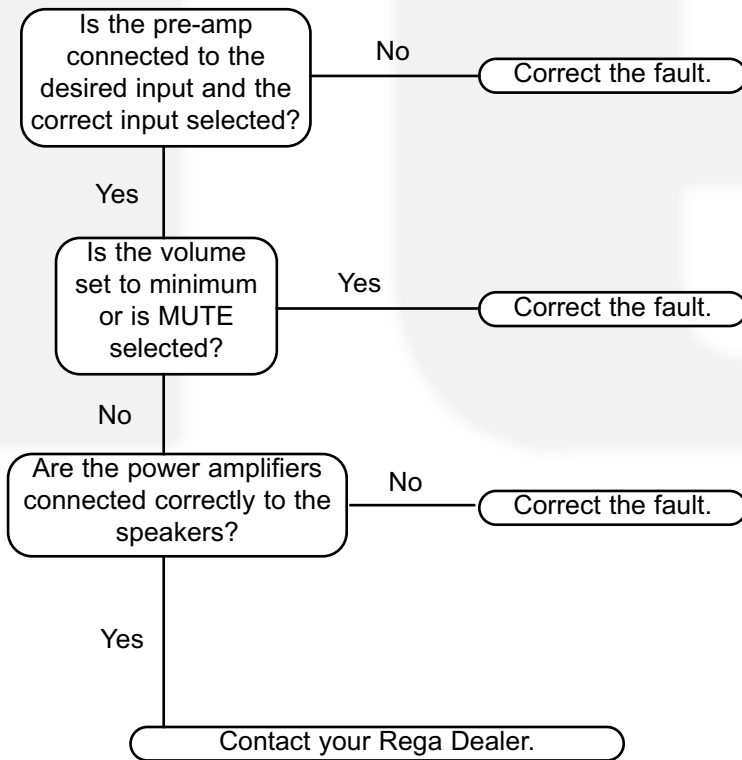
The filter is a 'notch' filter working at around 8.5Khz. It may sometimes improve the sonic performance of various makes of MC cartridges that are a little 'bright' sounding or under damped in construction.

Note: The filter is only for use in some circumstances. If you find that the filter does nothing or degrades the sound, simply switch it off.

## Troubleshooting (no power, front panel does not light)

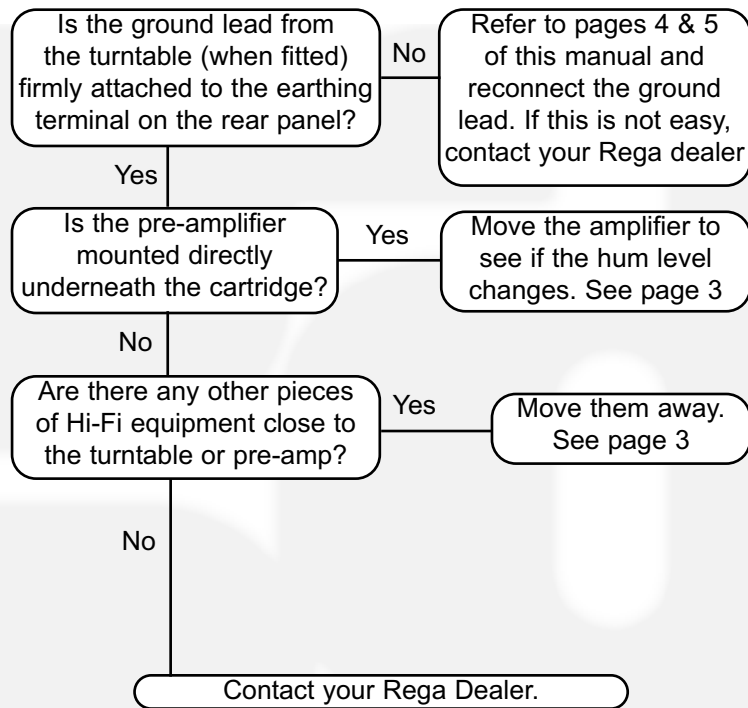


### Troubleshooting (Power on, front panel lit but no output)

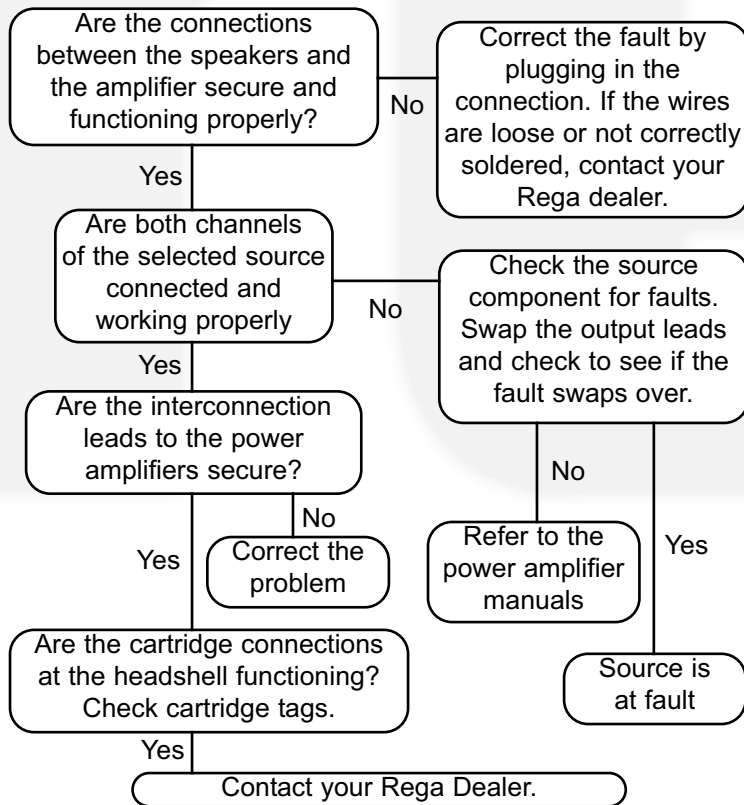


## Troubleshooting

(Loud hum when “phono” is selected)



### Troubleshooting (Power on, sound from one speaker only)





Output resistance	100 $\Omega$
Minimum output load resistance for -3dB point @ 15Hz	1K $\Omega$
RIAA accuracy	Better than 0.2dB 100Hz to 40KHz
Frequency Response	14Hz (-3dB) to 54KHz (-0.5dB)
THD	Better than 0.008% @ 1.5V 20Hz to 20KHz
THD bandwidth	100Hz to 22KHz
Output noise level	-80dBV (64dB gain setting & 15 $\Omega$ input load)
Notch Filter centre frequency	8.5KHz
Notch Filter maximum depth	-6.5dB
Notch Filter Q	2.5
AC Supply	230V & 115V Nominal +/-10%
Power Consumption	21 Watts

## Owners Log

(1)  
Owner.....  
Date.....  
Where Purchased.....  
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(2)  
Owner.....  
Date.....  
Where Purchased.....  
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(3)  
Owner.....  
Date.....  
Where Purchased.....  
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