OCTAVE

Input and Output Modules

Owner's Manual
English

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1. FOREWORD

Dear Music Enthusiast,

You have chosen a modular OCTAVE model that you can customize with different optional slide-in modules. Thank you for choosing this flexible solution from our product range and for your trust.

A variety of different input modules are available for your amplifier, both for the phono stage and additional line-level inputs. These phono slide-in modules from MM RCA, to MC RCA and XLR, though to switchable step-up transformers with balanced inputs allow you to adjust your amplifier inputs to all familiar cartridges in different levels of quality. RCA and XLR line inputs, switchable to balanced with transformers, all feature technologies developed exclusively by OCTAVE that can enormously enhance the sound properties of a premium D/A converter or CD player.

The same technology has been implemented for the outputs. Differentiated output modules provide the corresponding signal level to directly control preamplifiers, integrated amplifiers, and power amplifiers (direct drive modules). XLR or RCA, both connection types are available for both inputs and outputs. The output modules therefore generally feature one unregulated line-level output and one regulated output to always enable connection to a preamplifier and power amplifier.

The modular design of your amplifier allows you to continually improve your equipment and adapt to the latest technologies, just as our range of available modules is continually expanded.

We are certain that we have developed a future-proof product. Enjoy your musical journey!

Sincerely,

Andreas Hofmann

2. SAFETY INSTRUCTIONS

2.1. Before you begin

2.1.1. In case of emergency: disconnect the plug from the mains supply

Never use an amplifier that is damaged or faulty. Make sure it has been labeled as defective and that it cannot be used until it has been repaired by a qualified service engineer.

2.1.2. Do not open the case

There are dangerously high voltages inside this equipment. Never allow anyone except qualified personnel to open the case.

2.1.3. Service and maintenance

For reasons of safety, please ensure that servicing, repairs and other modifications to OCTAVE equipment are carried out only by a qualified technician. Defective fuses should also only be replaced by a qualified technician. Always replace fuses with ones of the same type and rating. If your amplifier requires servicing, please ship or take your equipment directly to OCTAVE or to one of our authorized service centers.

2.1.4. Before connecting

Make sure that the voltage of your amplifier matches your local supply voltage.

2.1.5. Placement

- The equipment is designed strictly for use in a dry domestic environment. Do not use it in open air or in damp environments!
- Never place plants or liquid-filled containers on the equipment. Take care that objects do not fall or liquids are not spilled into the enclosure. Should this happen, disconnect the mains plug immediately and have your amplifier checked by a qualified service technician.
- Condensation may form if the amplifier is taken from a cold environment into a warm one. In this case, wait until the amplifier has reached room temperature and is dry before switching it on.
- Avoid installing the equipment close to sources of heat, such as heaters, or anywhere that it may be in direct sunlight.
- Do not operate the equipment near flammable materials, gases, or vapors. Avoid areas where there may be heavy accumulations of dust or where the amplifier may be subject to mechanical vibration.
- Place your equipment on a stable, even surface.

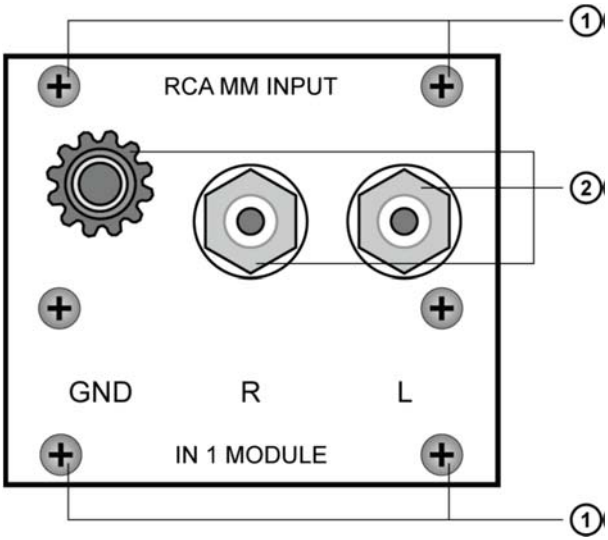
2.2. Warranty

OCTAVE can only guarantee the safety, reliability and performance of this unit if modifications and repairs are carried out by specialized personnel and if the amplifier is operated in accordance with the instructions contained in this manual.

3. MODULE OVERVIEW – PHONO INPUT MODULES

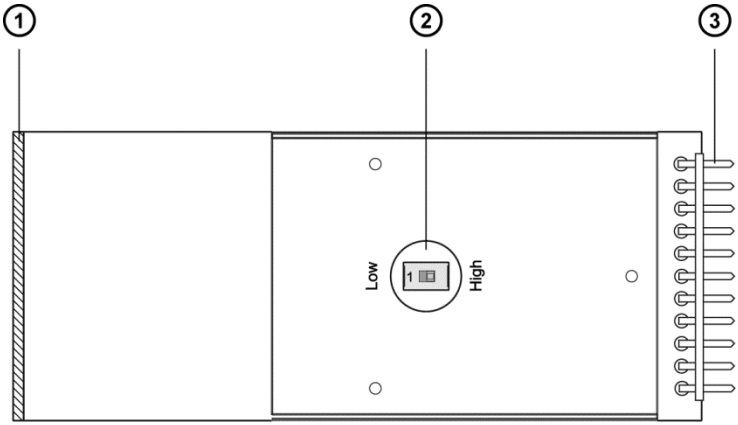
3.1. IN 1: MM RCA input module

3.1.1. IN 1 input module, rear panel



Legend		
(1)	**Mounting screws**	4 x size M3 x 8 cross slot, Phillips No. 1 screwdriver
(2)	**Connector panel**	GND: ground connector, R (red): RCA input, right, L (white): RCA input, left

3.1.2. Top view, IN 1 input module



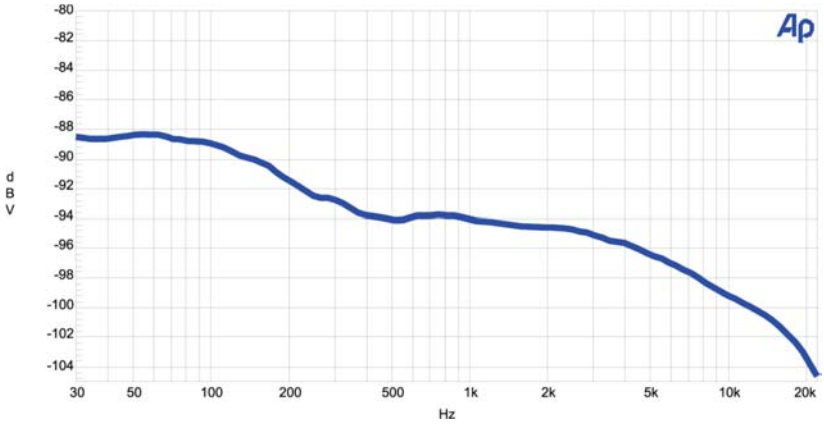
Legend			
(1)	**Rear panel**		
(2)	**Input impedance**	Low = 1 kohm	The “Low” setting is designed for special MC high-output systems with an MM output level.
		High = 47 kohms	The “High” setting is for classic MM pickup cartridge systems.
(3)	**Pin header for the pin connector in the main unit**	The input modules have one pin fewer than the output modules and can therefore only be mounted in input slots.	

3.1.3. IN 1 technical data

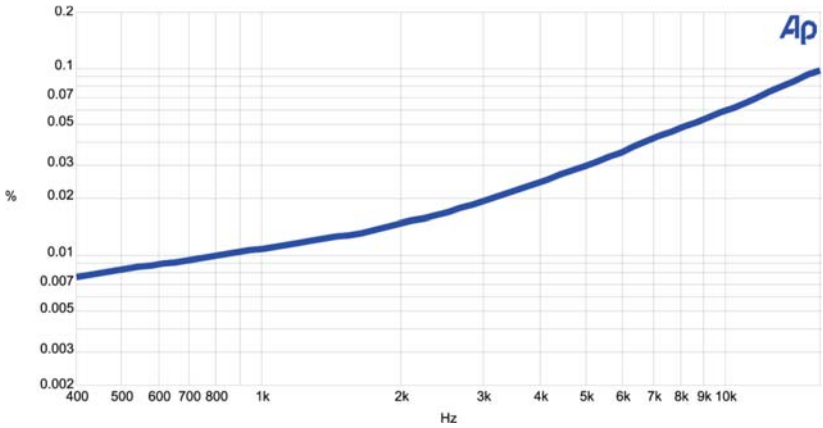
MM RCA technical data	
Input sensitivity	3 – 5 mV
Input impedance	1 kohms/47 kohms/220 pF
Gain factor	38 dB
Signal-to-noise ratio	■ 77 dB wideband ■ 94 dB bandpass measurement at 1 kHz

3.1.4. IN 1 diagrams

MM input noise level
Measurement on the fixed output

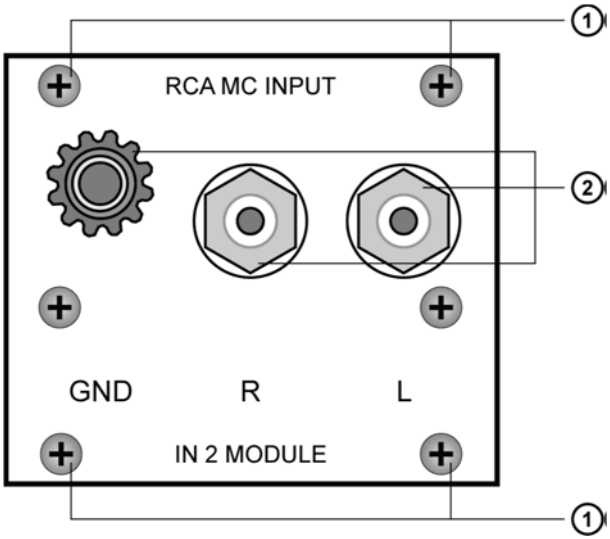


Total harmonic distortion THD in the range 400 Hz – 20 kHz
Measurement on the fixed output, output voltage 1 V



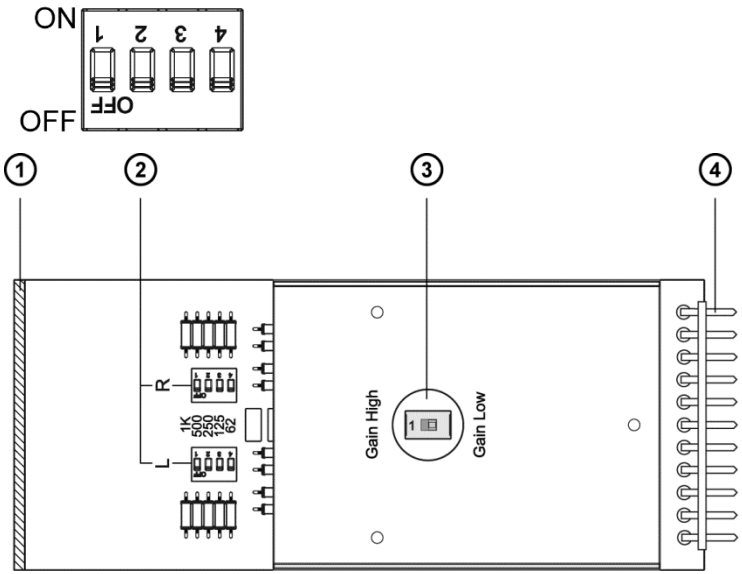
3.2. IN 2: MC RCA input module

3.2.1. IN 2 input module, rear panel



Legend		
(1)	**Mounting screws**	4 x size M3 x 8 cross slot, Phillips No. 1 screwdriver
(2)	**Connector panel**	GND: ground connector, R (red): RCA input, right, L (white): RCA input, left

3.2.2. Top view, IN 2 input module



Legend		
(1)	**Rear panel**	
(2)	**Resistance selector switch for right and left channel**	
(3)	**Gain switch**	Gain (amplification) switching enables the MC input to be adjusted to low and high-output systems. Please refer to the owner's manual for the pickup cartridge system provided by the manufacturer for the specific data for your pickup cartridge system. Gain high: for systems < 0.5 mV (condition on delivery) Gain low: for systems > 0.5 mV
(4)	**Pin header for the pin connector in the main unit**	The input modules have one pin fewer than the output modules and can therefore only be mounted in input slots.

Setting the input impedance for MC pickup cartridge systems

The input impedance value is important for balanced pickup cartridge sound.

MODULE OVERVIEW – PHONO INPUT MODULES

1. Please see the technical data or the pickup cartridge system's owner's manual for the recommended impedance.
2. Set the recommended input impedance according to the following table. If the recommended input impedance is not listed in the table, use the closest value. If two values are possible, you can select the optimal impedance using a listening test.

	Switch no.			
	1	**2**	**3**	**4**
1000 ohms	●	●	●	●
500 ohms	○	●	●	●
340 ohms	●	○	●	●
250 ohms	○	○	●	●
200 ohms	●	●	○	●
170 ohms	○	●	○	●
146 ohms	●	○	○	●
125 ohms	○	○	○	●
100 ohms	●	●	●	○
97 ohms	○	●	●	○
75 ohms	●	●	○	○
66 ohms	●	○	○	○
62 ohms	○	○	○	○

● = OFF / ○ = ON

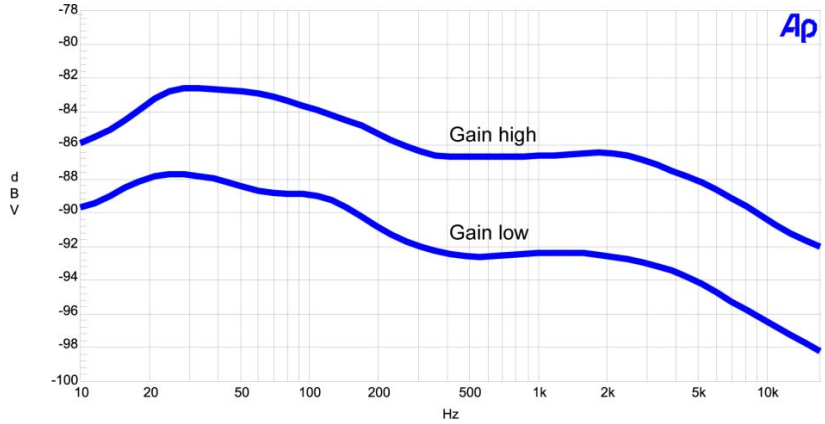
On delivery, the impedance is set to 100 ohms: This setting is optimal for most low-output MC pickup cartridge systems.

3.2.3. IN 2 technical data

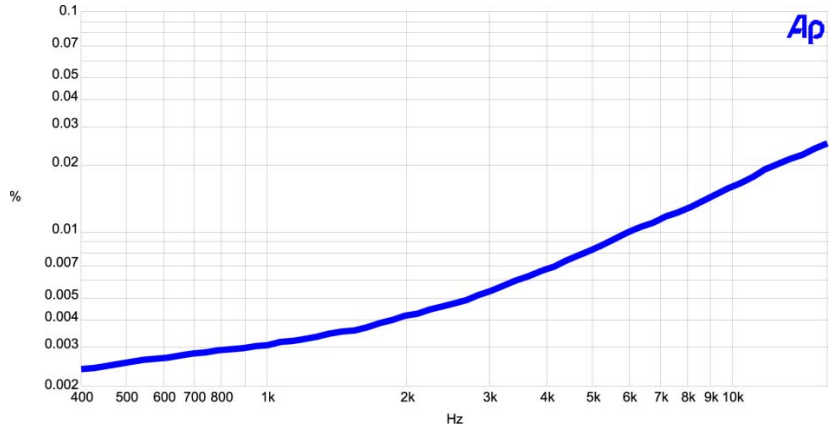
MC RCA technical data	
Input sensitivity	0.1 – 1 mV
Input impedance	62 – 1000 ohms || 4.7 nF
Gain factor	65 dB Gain high, 58 dB Gain low
Signal-to-noise ratio	■ 69 dB Gain high, -75 dB Gain low, wideband ■ 86.5 dB Gain high, -92.5 dB Gain low, bandpass measurement at 1 kHz
Noise factor	0.5 µV / √Hz with Gain low 1.27 µV / √Hz with Gain high

3.2.4. IN 2 diagrams

MC RCA input noise level
Measurement on the fixed output

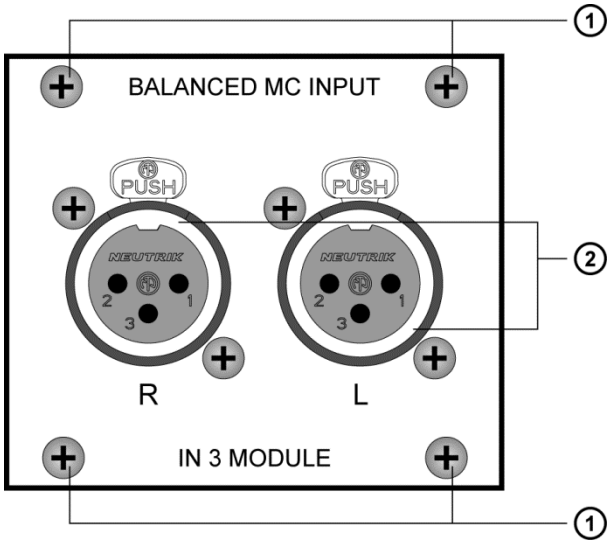


Total harmonic distortion THD in the range 400 Hz – 20 kHz
Measurement on the fixed output, output voltage 1 V



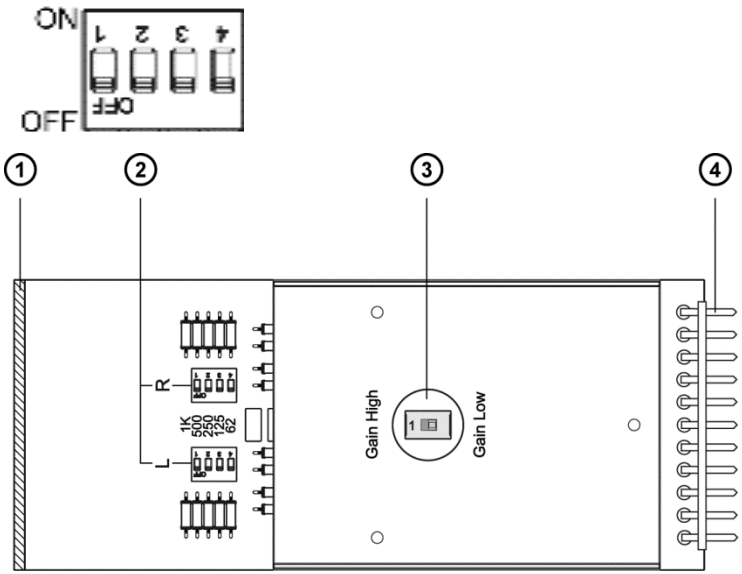
3.3. IN 3: MC XLR input module

3.3.1. IN 3 input module, rear panel



Legend		
(1)	**Mounting screws**	4 x size M3 x 8 cross slot, Phillips No. 1 screwdriver
(2)	**Connector panel**	R: right XLR input, L: left XLR input Pin 1 = ground (GND) Pin 2 = plus Pin 3 = minus

3.3.2. Top view, IN 3 input module



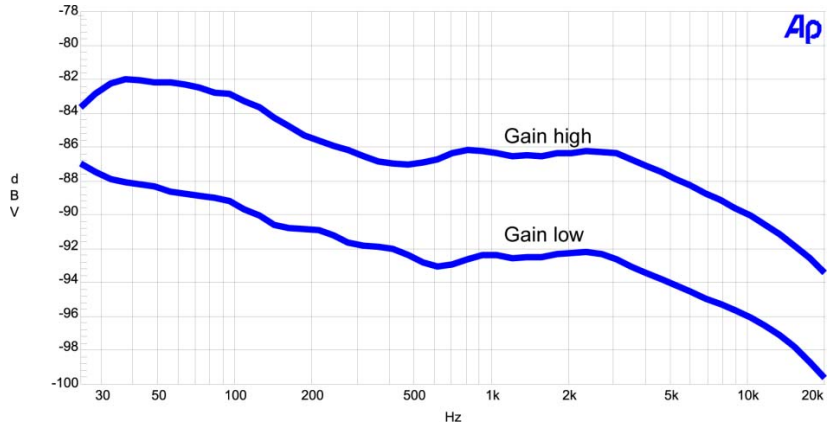
Legend		
(1)	**Rear panel**	
(2)	**Resistance selector switch for right and left channel**	(See “Setting the input impedance for MC pickup cartridge systems” on page 7)
(3)	**Gain switch**	Gain (amplification) switching enables the MC input to be adjusted to low and high-output systems. Please refer to the owner’s manual for the pickup cartridge system provided by the manufacturer for the specific data for your pickup cartridge system. Gain high: for systems < 0.5 mV (condition on delivery) Gain low: for systems > 0.5 mV
(4)	**Pin header for the pin connector in the main unit**	The input modules have one pin fewer than the output modules and can therefore only be mounted in input slots.

3.3.3. IN 3 technical data

MC XLR technical data	
Input sensitivity	0.1 – 1 mV
Input impedance	62 ohms – 1 kohm/4.7 nF
Gain factor	65 dB Gain high, 58 dB Gain low
Signal-to-noise ratio	■ 72 dB Gain high, -78 dB Gain low ■ 86.5 dB Gain high, -92.5 dB Gain low, bandpass measurement at 1 kHz
Noise factor	0.4 µV / √Hz with Gain low 1 µV / √Hz with Gain high

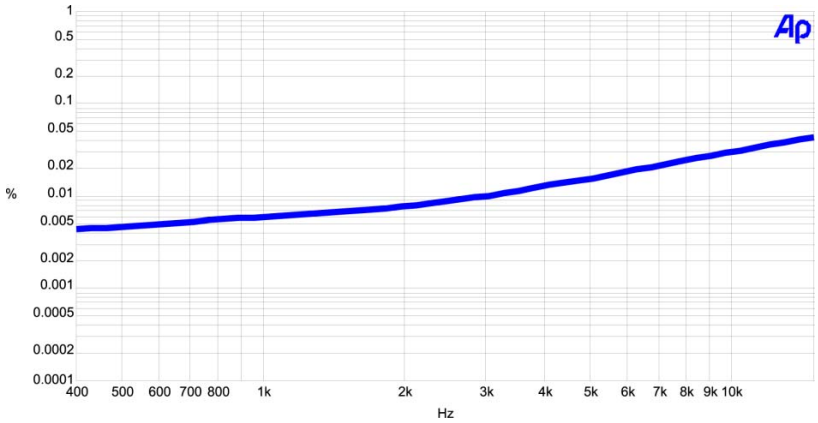
3.3.4. IN 3 diagrams

MC XLR input noise level
Measurement on the fixed output



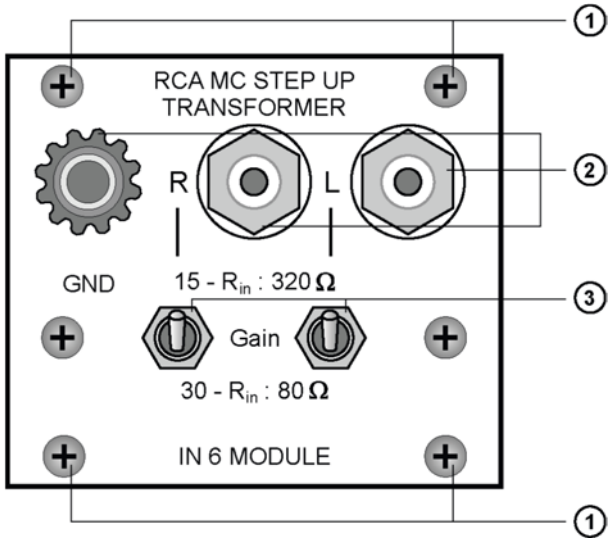
MODULE OVERVIEW – PHONO INPUT MODULES

Total harmonic distortion THD in the range 400 Hz – 20 kHz
Measurement on the fixed output, output voltage 2 V



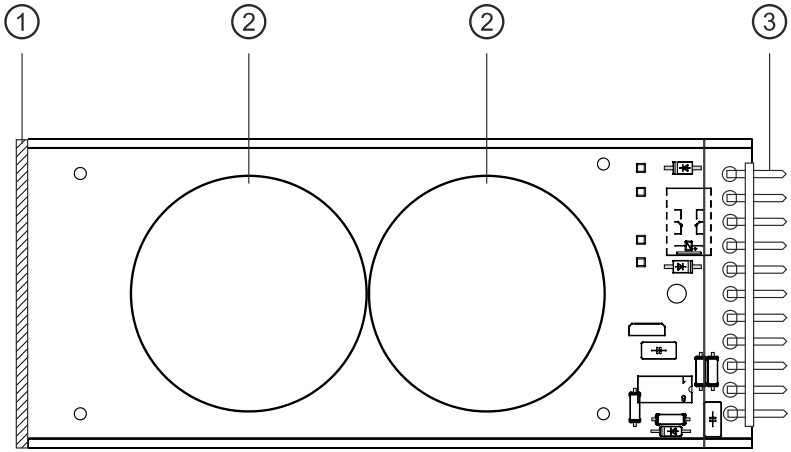
3.4. IN 6: MC RCA with step-up transformer

3.4.1. IN 6 input module, rear panel



Legend		
(1)	**Mounting screws**	4 x size M3 x 8 cross slot, Phillips No. 1 screwdriver
(2)	**Connector panel**	GND: ground connector, R (red): RCA input, right, L (white): RCA input, left
(3)	**Gain/input impedance**	Changeover switch, gain factor 15 (Low) resp. 30 (High). To switch over, both switches must always be operated (for left and right channel)

3.4.2. Top view, IN 6 input module



Legend		
(1)	**Rear panel**	
(2)	**Magnetically shielded transformer**	
(3)	**Pin header for the pin connector in the main unit**	The input modules have one pin fewer than the output modules and can therefore only be mounted in input slots.

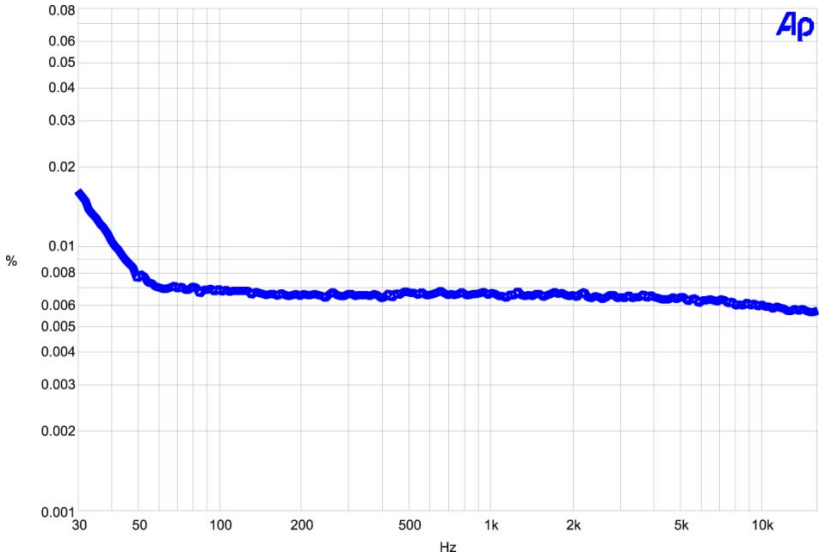
3.4.3. IN 6 technical data

MC RCA technical data, with step-up transformer, gain factor 15	
Input sensitivity	0.2 – 2 mV
Input impedance	< 320 ohms/30 Hz – 40 kHz
Gain factor	15
Cartridge internal DC resistance	5 – 25 ohms
Noise factor	-100 dB/1 kHz bandpass measurement
Recommended for medium- and high-resistance MC systems.	

MC RCA technical data, with step-up transformer, gain factor 30	
Input sensitivity	0.2 – 1 mV
Input impedance	< 80 ohms/30 Hz – 40 kHz
Gain factor	30
Cartridge internal DC resistance	0.5 – 5 ohms
Noise factor	-100 dB/1 kHz bandpass measurement
Recommended for low-resistance MC systems.	

3.4.4. IN 6 diagrams

Total harmonic distortion (THD + noise) of the transformer, gain factor 15

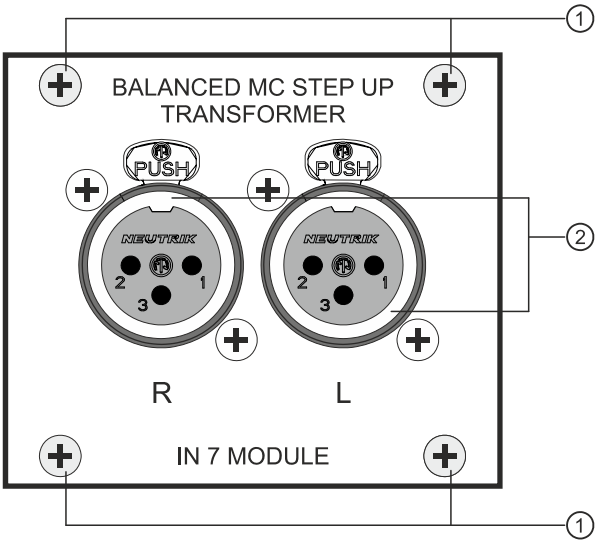


Distortion (THD) is extremely low at approximately 0.007 %.

Note Based on its design, the transformer tends towards a drop in gain at low frequencies. If the pickup cartridge/arm resonance is under 8 Hz, this allows for device operation with the subsonic filter switched off.

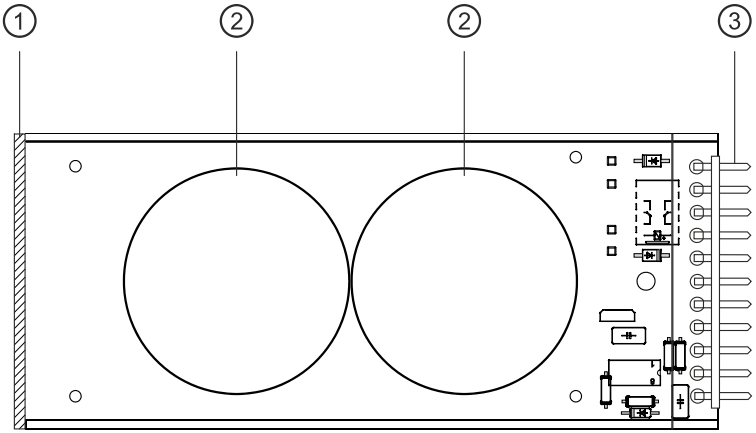
3.5. IN 7: MC XLR with step-up transformer

3.5.1. IN 7 input module, rear panel



Legend		
(1)	**Mounting screws**	4 x size M3 x 8 cross slot, Phillips No. 1 screwdriver
(2)	**Connector panel**	R: right XLR input, L: left XLR input Pin 1 = ground (GND) Pin 2 = plus signal Pin 3 = minus signal

3.5.2. Top view, IN 7 input module



Legend		
(1)	**Rear panel**	
(2)	**Magnetically shielded transformer**	
(3)	**Pin header for the pin connector in the main unit**	The input modules have one pin fewer than the output modules and can therefore only be mounted in input slots.

3.5.3. IN 7 technical data

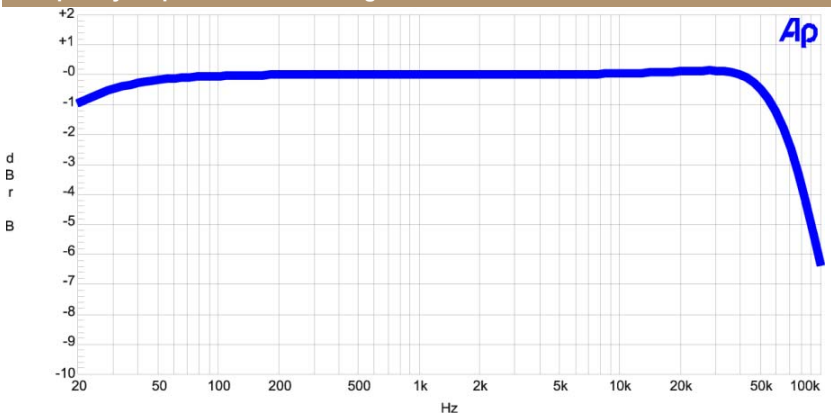
MC XLR technical data with step-up transformer	
Input sensitivity	0.2 – 2 mV
Input impedance	< 200 ohms/30 Hz – 40 kHz
Gain factor	20
Cartridge internal DC resistance	1 – 25 ohms
Noise factor	-100 dB/1 kHz bandpass measurement

3.5.4. IN 7 description

IN 7 is a step-up transformer with balanced inputs with a gain ratio of 1:20. Balanced connection of the pickup cartridge is advantageous with regard to the S/N ratio if the signal cable to the phono input is relatively long and utmost demands are placed on tonal clarity.

3.5.5. IN 7 diagrams

Frequency response with a cartridge DC resistance of 5 ohms



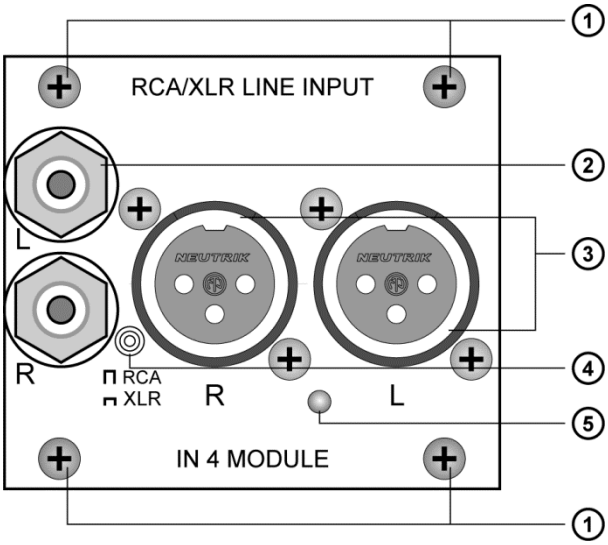
Due to the lossless core of the transformer the input impedance is high and constant. This results in the flat frequency response of 20 Hz – 75 kHz (-1/-3 dB) even with a cartridge resistance up to 5 ohms.

Note Based on its design, the transformer tends towards a drop in gain at low frequencies. If the pickup cartridge/arm resonance is under 8 Hz, this allows for device operation with the subsonic filter switched off.

4. MODULE OVERVIEW – LINE INPUT MODULES

4.1. IN 4: Line-in XLR/RCA, switchable

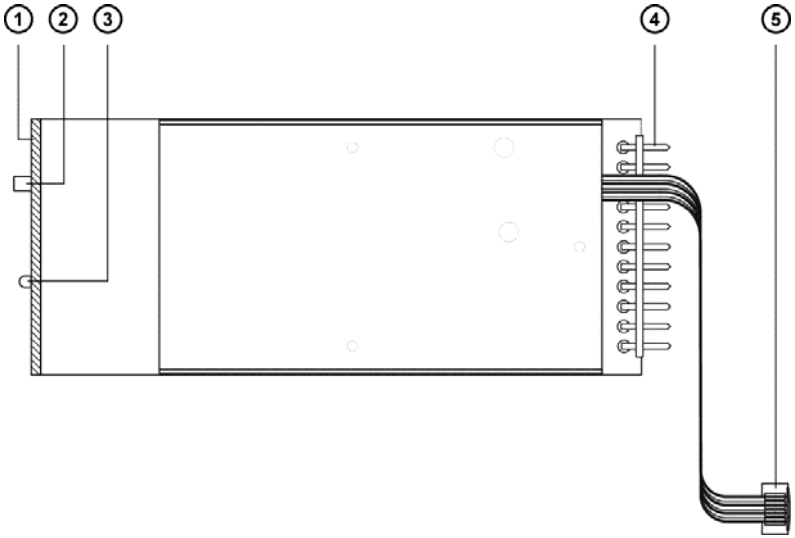
4.1.1. IN 4 input module, rear panel



Legend		
(1)	**Mounting screws**	4 x size M3 x 8 cross slot, Phillips No. 1 screwdriver
(2)	**RCA inputs**	L (white): left input, R (red): right input
(3)	**XLR inputs**	R: right input, L: left input
(4)	**Push button switch**	To switch between RCA and XLR
(5)	**LED**	If the push button switch is pressed, the XLR inputs are activated (XLR LED illuminates).

Note If the XLR input is activated, the LED does not illuminate until the input module has been selected using the control panel on the device front panel.

4.1.2. Top view, IN 4 input module

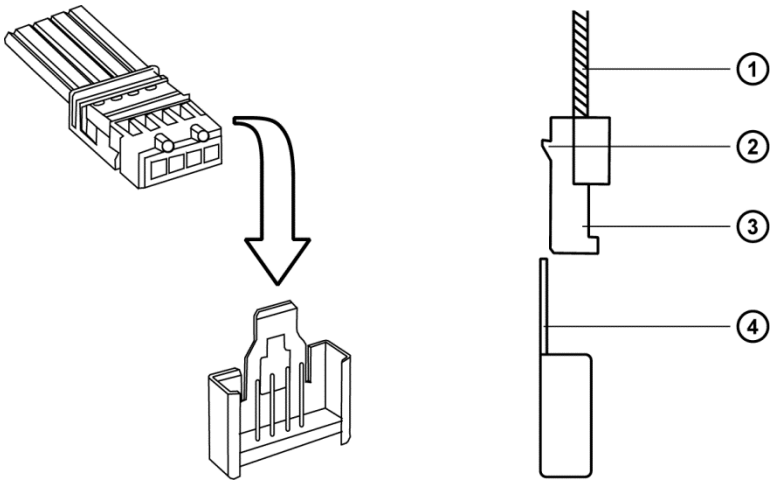


Legend			
(1)	Rear panel	(4)	Pin header for the pin connector in the main unit
(2)	Push button switch	(5)	Ribbon cable connector
(3)	LED		(For assembly, see page 22).

4.1.3. Installing the IN 4/IN 8 input module

Connecting the ribbon cable connector

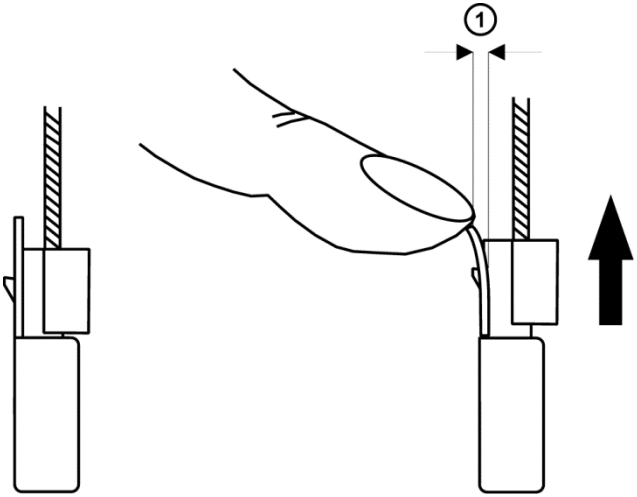
- ► Please disconnect the unit from the mains before opening the cover
- ► Push in the ribbon cable connector until the locking pin clicks into the locking lever.



Legend			
(1)	Ribbon cable	(3)	Ribbon cable connector
(2)	Locking pin	(4)	Locking lever

Removing the ribbon cable connector

1. Carefully bend the locking lever 2 mm to the back.
2. Grip the ribbon cable connector on the side and pull it upward. Do not pull out the connector with the cable.



Legend
(1) Ribbon cable connector tab

4.1.4. IN 4 technical data

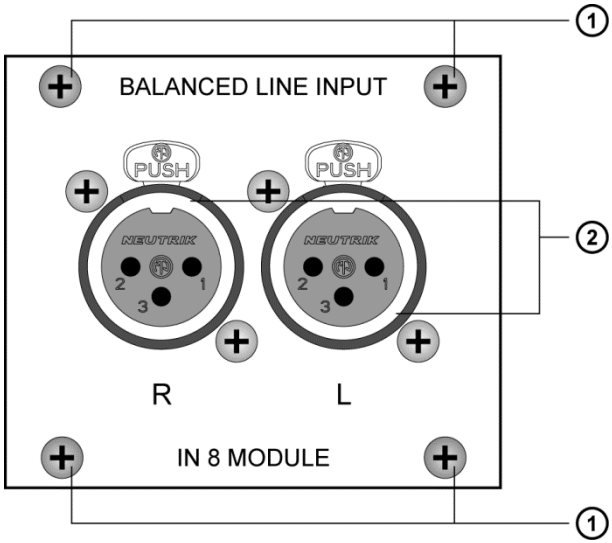
Line-in technical data, switchable	
Input sensitivity	100 mV – 7 V
RCA/XLR input impedance	50 kohms/25 kohms
RCA/XLR gain factor	0 dB/+6 dB
Crosstalk attenuation L – R	>-80 dB
Signal-to-noise ratio RCA/XLR	-120 dB → fixed output
Total harmonic distortion THD, RCA/XLR	-125 dB

4.1.5. IN 4 description

With the **IN 4** line-in input module, the device can be upgraded to a preamplifier with line-level input. The fully balanced XLR input enables the connection of premium balanced source devices. The signal-to-noise ratio and the distortion level of the IN 4 input are state-of-the-art.

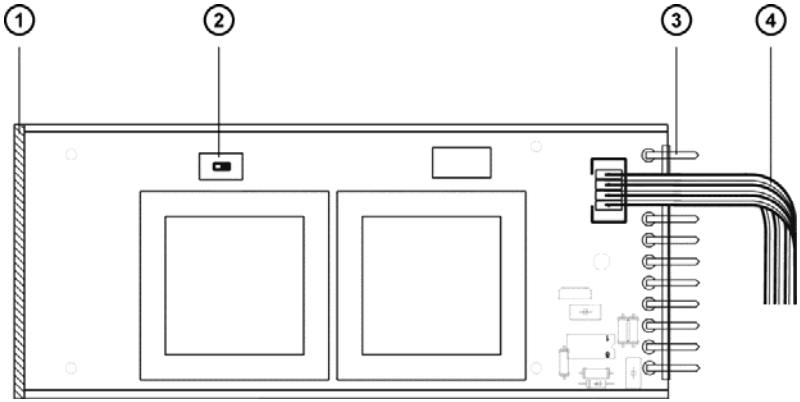
4.2. IN 8: Line-in XLR with transformer

4.2.1. IN 8 input module, rear panel



Legend		
(1)	**Mounting screws**	4 x size M3 x 8 cross slot, Phillips No. 1 screwdriver
(2)	**Connector panel**	R: right XLR input, L: left XLR input Pin 1 = ground (GND) Pin 2 = plus signal Pin 3 = minus signal

4.2.2. Top view, IN 8 input module



Legend		
(1)	**Rear panel**	
(2)	**Ground lift**	Slide switch position toward rear panel: Ground connected Slide switch position toward pin header: Ground disconnected The ground lift allows you to isolate the ground connection of the balanced input and signal ground of the main unit. If the CD player or DAC has only a two-pin mains plug (without ground connection), you should use the connected position.
(3)	**Pin header for the pin connector in the main unit**	The input modules have one pin fewer than the output modules and can therefore only be mounted in input slots.
(4)	**Ribbon cable connector**	For assembly with the main board (for assembly, see 22).

4.2.3. Description

IN 8 is a line input module for XLR with a balanced input transformer. The ground connection of the XLR input and the preamplifier can be isolated using a switch on the module board.

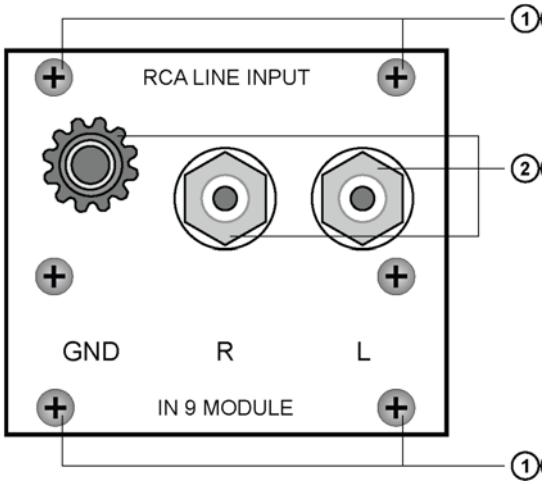
Based on the transformer coupling, this module is the ideal connection between modern USB DACs, music servers, etc.

4.2.4. IN 8 technical data

Line-in XLR technical data, with transformer	
Input sensitivity	100 mV – 6 V
Input impedance	10 kohms/ 30 Hz – 40 kHz
Gain factor	0 dB /1:1 transformer
Signal-to-noise ratio	-115 dB
Frequency range	30 Hz – 80 kHz/-1 dB

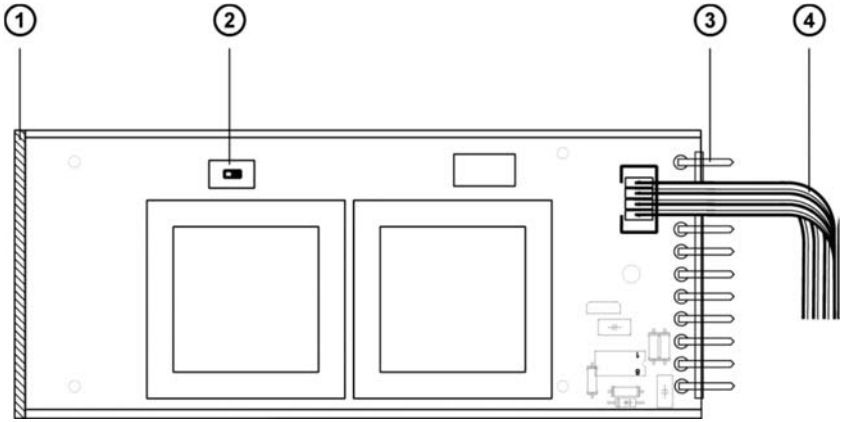
4.3. IN 9: Line-in RCA with transformer

4.3.1. IN 9 input module, rear panel



Legend		
(1)	**Mounting screws**	4 x size M3 x 8 cross slot, Phillips No. 1 screwdriver
(2)	**Connector panel**	GND: ground connector, R (red): RCA input, right, L (white): RCA input, left

4.3.2. Top view, IN 9 input module



Legend		
(1)	**Rear panel**	
(2)	**Ground Lift**	Slide switch position toward rear panel: Ground connected Slide switch position toward pin header: Ground disconnected The ground lift allows you to isolate the ground connection of the balanced input and signal ground of the main unit. If the CD player or DAC has only a two-pin mains plug (without ground connection), you should use the connected position.
(3)	**Pin header for the pin connector in the main unit**	The input modules have one pin fewer than the output modules and can therefore only be mounted in input slots.
(4)	**Ribbon cable connector**	For assembly with the main board (for assembly, see 22).

4.3.3. IN 9 technical data

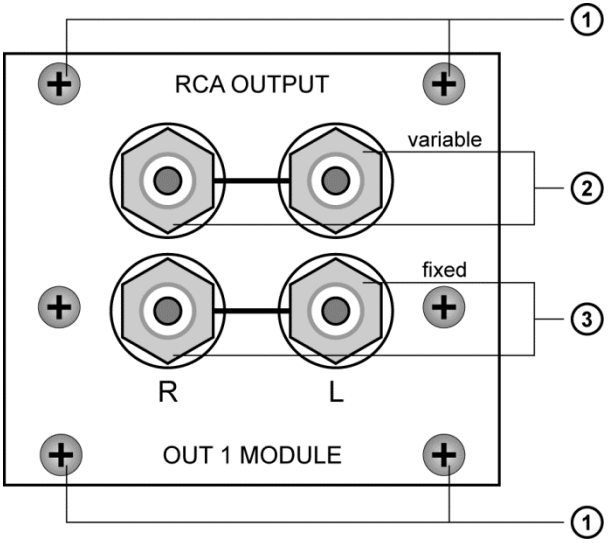
4.2.4See section 4.2.4, page 26.

5. MODULE OVERVIEW – OUTPUT MODULES

Note Outputs on OCTAVE preamplifiers are generally installed permanently. By contrast, the OCTAVE **Phono Module** features modular outputs. Therefore, different output modules can also be used in the **Phono Module**.

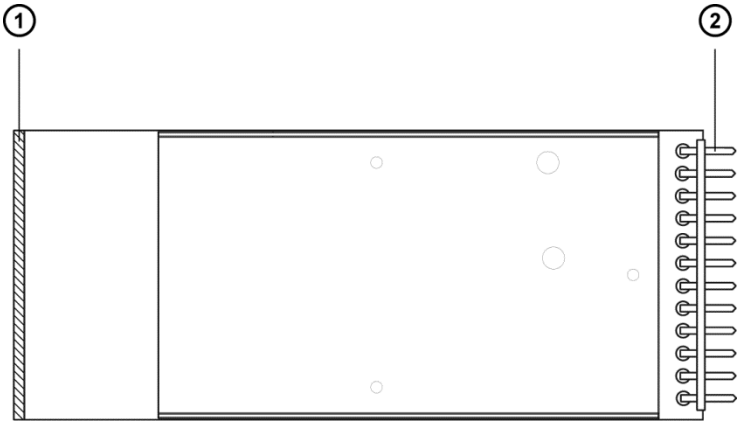
5.1. OUT 1 output module: Standard RCA

5.1.1. OUT 1 output module, rear panel



Legend		
(1)	**Mounting screws**	4 x size M3 x 8 cross slot, Phillips No. 1 screwdriver
(2)	**Variable RCA outputs**	Regulated RCA outputs. R (red): right output, L (white): left output
(3)	**Fixed RCA outputs**	Unregulated RCA outputs. R (red): right output, L (white): left output

5.1.2. Top view, OUT 1 output module



Legend	
(1)	Rear panel
(2)	Pin header for the pin connector in the main unit

5.1.3. OUT 1 technical data

Standard RCA technical data	
Fixed output voltage	2 V
Variable output voltage	0 – 2 V
Fixed output resistance	250 ohms
Variable output resistance	250 ohms
Signal-to-noise ratio	-120 dB; regulated output

5.1.4. Regulated output (variable)

The regulated output of OUT 1 can be used for external headphone amplifiers or as a direct recording output for tape or PC.

It is only suitable to control external power amplifiers to a certain extent since the output level is at line level and is therefore insufficient for power amplifiers at full power.

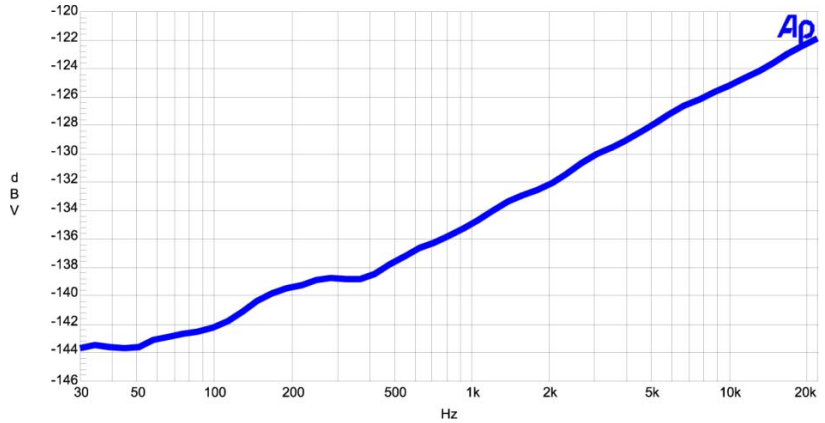
5.1.5. Unregulated output (fixed)

The unregulated output supplies an output signal at line level 0.7 V at approximately the same magnitude as a modern CD player.

This output is intended for connection to line-level inputs on a preamplifier/integrated amplifier.

5.1.6. OUT 1 diagrams

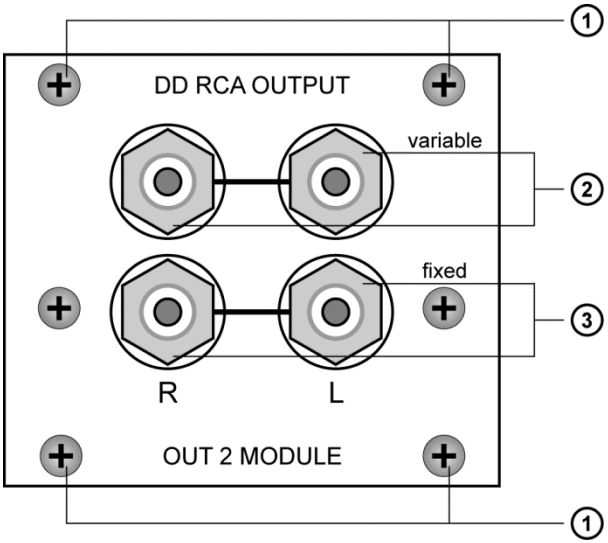
Interfering signal, regulated output, Volume control at "0"



The signal-to-noise ratio of the regulated output is extremely high at -136 dB/1 kHz.

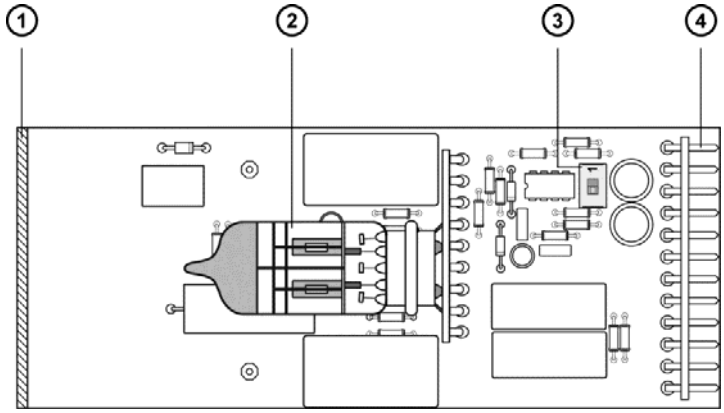
5.2. OUT 2 output module: RCA direct drive

5.2.1. OUT 2 output module, rear panel



Legend		
(1)	**Mounting screws**	4 x size M3 x 8 cross slot, Phillips No. 1 screwdriver
(2)	**Variable RCA outputs**	Regulated RCA outputs. R (red): right output, L (white): left output
(3)	**Fixed RCA outputs**	Unregulated RCA outputs. R (red): right output, L (white): left output

5.2.2. Top view, OUT 2 output module



Legend		
(1)	**Rear panel**	
(2)	**6N6 tube**	Amplifier tube only for regulated output. Also available under designations 6N23, ECC88, and 6922.
(3)	**Gain switch**	Gain switch for switching the gain of the regulated output.
	Position 1: Gain = 0 dB	The level in position 1 is identical to the level of the fixed output.
	Position 2: Gain = +14 dB	Position 2 increases the level to values required for power amplifiers.
	Note	Disconnect the unit from mains before open the unit. To prevent any “plop” noises, only press the gain switch when the main unit is switched off.
(4)	**Pin header for the pin connector in the main unit**	

5.2.3. OUT 1 technical data

RCA direct drive technical data	
Output voltage	0.5 – 1 V fixed/0 – 7 V variable
Output resistance	250 ohms fixed / 320 ohms variable
Signal-to-noise ratio	-100 dB Gain high, -110 dB Gain low, regulated output
Frequency response	10 Hz – 200 kHz/-0.5 dB
Total harmonic distortion + noise	0.001% at 2 V/1 kHz

5.2.4. Regulated output of the OUT 2 module (variable)

The regulated output is controlled by a separate line stage on the OUT 2 module. The variable output is intended for direct control of unbalanced power amplifiers and active loudspeakers. The output level can be adapted to the sensitivity of the power amplifier/loudspeaker combination in two levels using the gain switch.

5.2.5. Unregulated output (fixed)

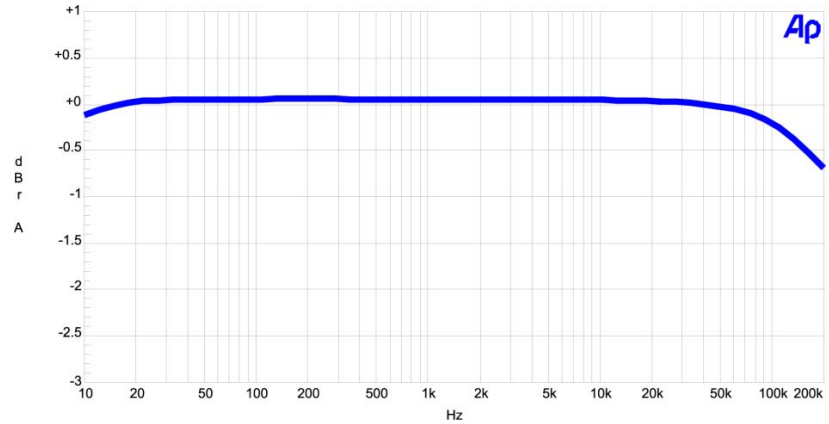
The unregulated output supplies an output signal at line level 0.7 V at approximately the same magnitude as a modern CD player.

This output is intended for connection to line-level inputs on a preamplifier/integrated amplifier.

Note If two devices are connected to each the unregulated and regulated outputs, the device connected to the unregulated output may cause interference with the signal of the regulated output. For example, by switching off the device using the power switch. If this occurs, the device must be separated from the unregulated output.

5.2.6. OUT 2 diagrams

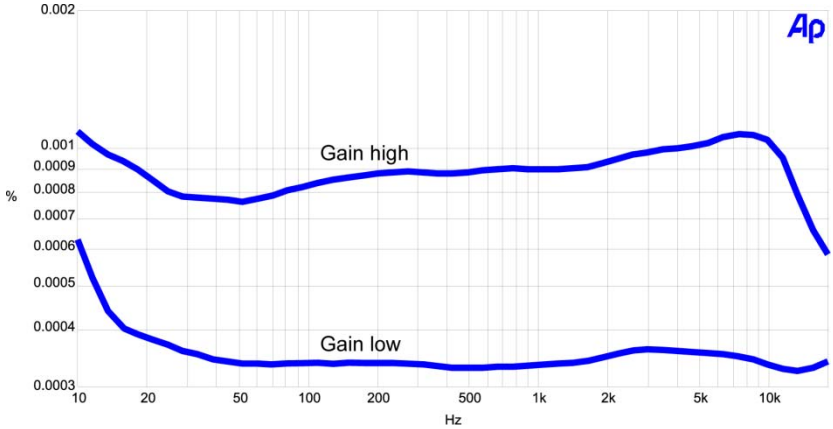
Frequency response



The frequency response of the OUT 2 amplifier has a very wide range and is linear.

Total harmonic distortion THD Gain high and Gain low in the range 10 Hz - 20 kHz

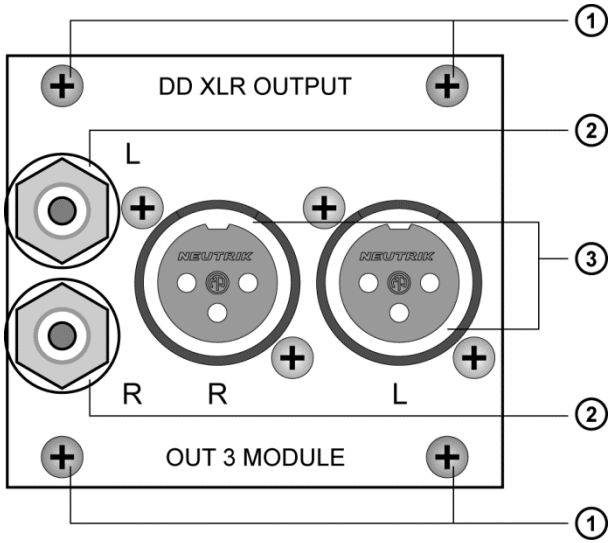
Measurement on regulated output, output voltage 2 V



Both graphs show an extremely low level of distortion.

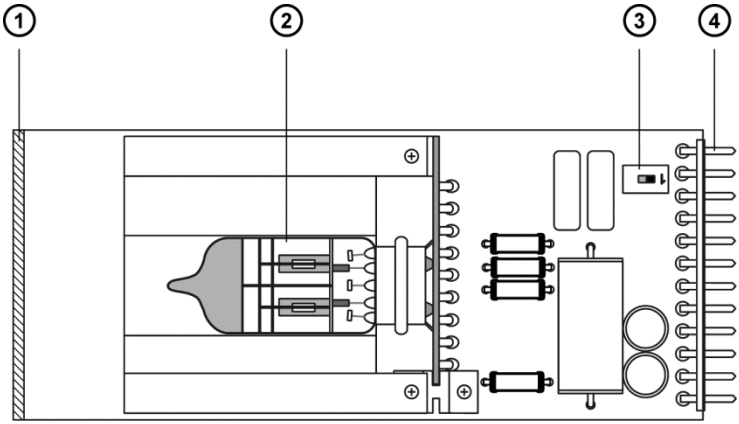
5.3. OUT 3 output module: XLR direct drive

5.3.1. OUT 3 output module, rear panel



Legend		
(1)	**Mounting screws**	4 x size M3 x 8 cross slot, Phillips No. 1 screwdriver
(2)	**RCA outputs**	Unregulated RCA outputs. R (red): right output, L (white): left output
(3)	**XLR outputs**	Regulated XLR outputs. R: right XLR output, L: left XLR output

5.3.2. Top view, OUT 3 output module



Legend		
(1)	**Rear panel**	
(2)	**6N1 tubes**	Amplifier tubes only for regulated output. Also available under designations 6N23, ECC88, and 6922.
(3)	**Function switch**	Switch to switch between the XLR output “variable”/“fix” functions. Position 1: regulated output level Position 2: unregulated output level
	Note	Only press the function switch when the device is disconnected from mains !!
(4)	**Pin header for the pin connector in the main unit**	

5.3.3. OUT 3 technical data

XLR direct drive technical data	
Output voltage	0.5 – 1 V fixed/0 – 14 V variable
Output resistance	250 ohms fixed / 320 ohms variable
Signal-to-noise ratio	-100 dB Gain high, -110 dB Gain low, regulated output
Frequency response	10 Hz – 200 kHz/-0.8 dB
Total harmonic distortion + noise	0.001% at 4 V/1 kHz

5.3.4. Regulated XLR output of the OUT 3 module (variable)

The regulated output is controlled by a separate line stage on the OUT 3 module. The regulated XLR output is intended for direct control of balanced power amplifiers, active loudspeakers, preamplifiers, and integrated amplifiers. The function regulated – unregulated (or variable – fixed) can be set with the function switch.

5.3.5. Unregulated output (fixed)

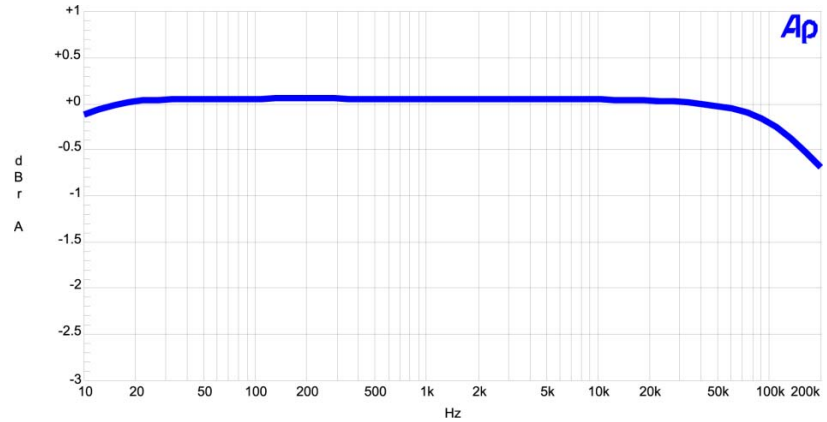
The unregulated output supplies an output signal at line level 0.7 V at approximately the same magnitude as a modern CD player.

This output is intended for connection to line-level inputs on a preamplifier/integrated amplifier.

Note If two devices are connected to each the unregulated and regulated outputs, the device connected to the unregulated output may cause interference with the signal of the regulated output. For example, by switching off the device using the power switch. If this occurs, the device must be separated from the unregulated output.

5.3.6. OUT 3 diagrams

Frequency response



The frequency response of the OUT 3 amplifier has a very wide range and is linear.

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