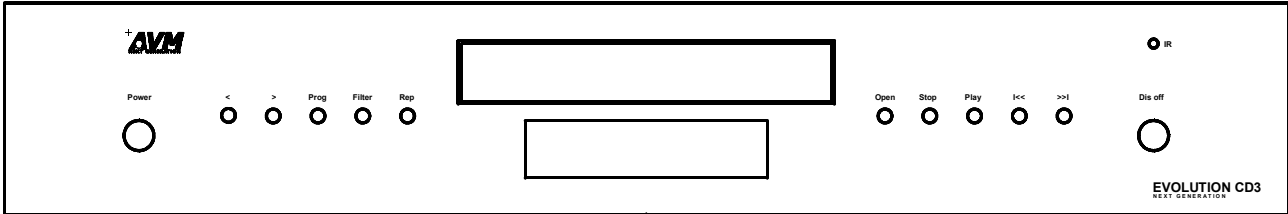


operating instructions

CD-player EVOLUTION CD3NG



Dear customer,

thank You for purchasing this AVM product. You own now a versatile, excellent sounding hifi component. Before enjoying music, please read this manual carefully. After that You will know how to use Your new AVM component in the optimal way.

Sincerely Yours

Your AVM-Team

CAUTION: This unit contains a class 1 laser diode. Do not open. Invisible laser radiation can damage Your eyes.

Laser diode	Type	:	Ga-Al-As
	Wavelength	:	755 - 815 nm (@ 25 °C)
	Output power	:	0,7 mW max.

CLASS 1 LASER PRODUCT
LASER KLASSE 1

NOTE: Use only high quality cables for connection between the unit and the other components of Your hifi set. We recommend cable lengths under 50 cm to avoid interferences which can affect the reception of radio and TV tuners.

Declaration of conformity (for EC only)

We herewith confirm, that the unit to which this manual belongs fullfills the EC rules necessary to obtain the sign



the necessary measurements were taken with positive results.

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Table of contents

Chapter	page
Präamble	2
Table of contents	3
1. Basic informations	4
1.1 Mechanical construction	4
1.2 Power supply	4
1.3 The drive	4
1.4 Digital- / analogue conversion	4
1.4.1 Quantization noise	4
1.4.2 Reduction of jitter	5
1.4.3 Filtering	5
1.4.4 Digital- / analogue conversion	5
2. Control elements and connectors	6
2.1 EVOLUTION CD3NG overview	6
2.2 Connectors	6
2.3 Installation and cooling	7
2.4 Connection to mains	7
2.5 Connection to an amplifier	7
2.6 Connection to digital recorders / external DACs	7
2.7 External remote control	7
3. Basic operation	8
3.1 Switching on / standby	8
3.2 playable disc formats	8
3.3 insert / eject disc	8
3.4 Playing CDs	8
3.5 Repeat	8
3.6 Random play	8
3.7 Programming a playlist	9
3.8 Select filter	9
3.9 Display off	9
4. Remote control (option)	9
5. Cleaning	9
6. If something doesn't work	9
7. Conditions of warranty (EC only)	10
8. Technical data EVOLUTION CD3NG	10

1. Basic information about the CD3NG

1.1 Mechanical construction

The case is fully made of steel. This material acts as a shield and protects drive and circuitry against interferences from external magnetical and electrical fields. The audio-connectors are all gold plated to minimize electrical losses and provide long lasting perfect contacts.

1.2 Power supply

A toroidal transformer together with 10.000 μ F of capacitance supplies the power for the CD3NG's circuitry. All voltages are well regulated to avoid hum and are additionally buffered by large capacitors directly in the circuitry where they are needed.

1.3 The drive

The disc is read by a drive especially made for CD. It can theoretically read CDs at 2 times the normal speed. Thus the positioning of the laser pickup and the focus regulation can act very quick. So the drive never comes to it's limits when reading audio CDs at normal speed. Besides normal audio compact discs the drive can also read CDRoms and some CDRWs.

1.4 Digital- / analogue conversion

The CD3NG is equipped with upsampling circuitry and highly precise a/d converters. The theory of function will be described in the following text. If You are not interested in technical details, skip these chapters and simply listen to the music coming from the CD3NG. You will discover Your CD collection anew! And that is what we want to achieve. Because application of new technologies is not just a gimmick but offers audible and measurable advantages to the listener.

1.4.1 Quantization noise

The quantity of information on a CD is defined by the audio format of 44,1 kHz sampling rate and 16 bits of resolution. Additional informations (i.e. higher resolution or bandwidth) cannot be created by any electronic circuitry playing back such a CD. It is a fact that conventional d-/a converter systems do not fully reproduce the given information. This has several reasons: Converting a digital signal to an analogue signal produces analogue noise. This is because the digital (quantized) values which represent the signal are discrete with a very fine – but nevertheless limited - resolution. Therefore exist slight deviations in respect to the analogue original signal which was continuous (means infinite resolution). These deviations are random and cause an additional noise to the original signal when it is converted from the digital domain to the analogue domain. This kind of noise is called quantization noise.

The characteristic of this noise is that it has an energy which depends on the resolution used to quantize the original signal and which is continuously spread over the whole range of the sampling frequency bandwidth. It is obvious that this noise can mask fine details of the originally recorded music.

For physical reasons it is not possible to avoid quantization noise. Also a reduction of the total noise energy is not possible because the noise has been created when the signal was recorded. An elegant solution of this problem is to increase sampling frequency when re-converting the signal from digital to analogue. The upsampling converter installed in the CD3NG can increase sampling frequency from 44,1 kHz up to 192 kHz.

When re-converting the upsampled signal the upsampling converter produces the same amount of noise energy as a conventional converter.

The difference is that the noise energy is spread over a much broader frequency band. So the part of noise energy which is within the audible spectrum decreases. You can imagine that like if You have a certain volume of fluid in a small glass. If You fill the fluid in a glass which has much more diameter the quantity of fluid doesn't change but the level will be lower than in the small glass. In the same way the increasing of sampling frequency (called upsampling) broadens the noise bandwidth and reduces the noise level. Most of the noise energy now is located in a frequency region beyond the audible range and can easily be filtered out without affecting the music signal.

1.4.2 Reduction of jitter

Jitter means slight, varying deviations in the sampling frequency of a digital signal. These deviations come from deviations in speed of the CD when it is played back (a natural effect, which can be reduced by mechanical means, but never fully eliminated). They can additionally come from electronic circuits through which the signal must pass. When such a signal is converted to analogue the samples arrive sometimes a little bit too early, sometimes a little bit too late at the DAC. This leads to modulations in the analogue signal which can affect the quality of the reproduced music. The spatial image is not precise, You cannot exactly locate the instruments, the sound is a bit roughened.

The solution for this problem is upsampling. Upsampling does not only mean multiplying of sampling frequency by a fixed factor like it is done by the oversampling technique used in former times. Upsampling technique is more similar to recording the original digital signal anew with a different sampling frequency (re-clocking). That means that the sampling frequency of the original signal and the upsampled signal are fully independent of each other. Thus if the upsampling converter has a stable jitter free clock the upsampled signal contains less jitter than the original digital signal.

The musical advantages of re-clocking are the second reason why the AVM CD3NG is equipped with a brandnew upsampling circuitry and an additional stable oscillator circuit.

1.4.3 Filtering

If a digital signal is converted to analogue the analogue signal contains not only the original signal, but as well it's mirror image which lies in the frequency domain beyond one half of the sampling frequency. This mirror image (aliasing) can cause unwanted interferences with the original signal and thus must be filtered out before passing the signal to the amplifier.

If the original sampling rate of 44,1 kHz is used the filter slope must be positioned somewhat above 20 kHz and has to be very sharp in order to let the audio signal pass and to eliminate the aliasing components. Such filters cause a large phase deviation at the end of the pass band and have often also amplitude deviations. This leads to a harsh reproduction of music and can also affect the localization of solo instruments and voices.

Upsampling to higher rates makes it possible to set the filter frequency far out of the audio signal range. For example at 192 kHz sampling rate the filter must take effect at 96 kHz. In this frequency region no music signal is present. Thus the filter can theoretically not affect musical reproduction.

Anyhow the filter frequency and the gradient of the slope – even if out of normal audio range have some subtle, but audible influence on the musical reproduction. Therefore the CD3NG offers You five different filter characteristics. So You can choose Your favorite filter upon Your own taste.

1.4.4 Digital- / analogue conversion

The CD3NG uses highly precise 24-bit converters to reproduce the analogue signal out of the digital data. The converters output balanced signals. These signals are fed into a differential amplifier. The difference between the signals is twice the audio signal (because one of the signals is inverted) and the difference of the inaccuracies of the converters. As the two converters per channel are on the same chip, their inaccuracy is nearly the same and thus also nearly eliminated by the differential amplifier.

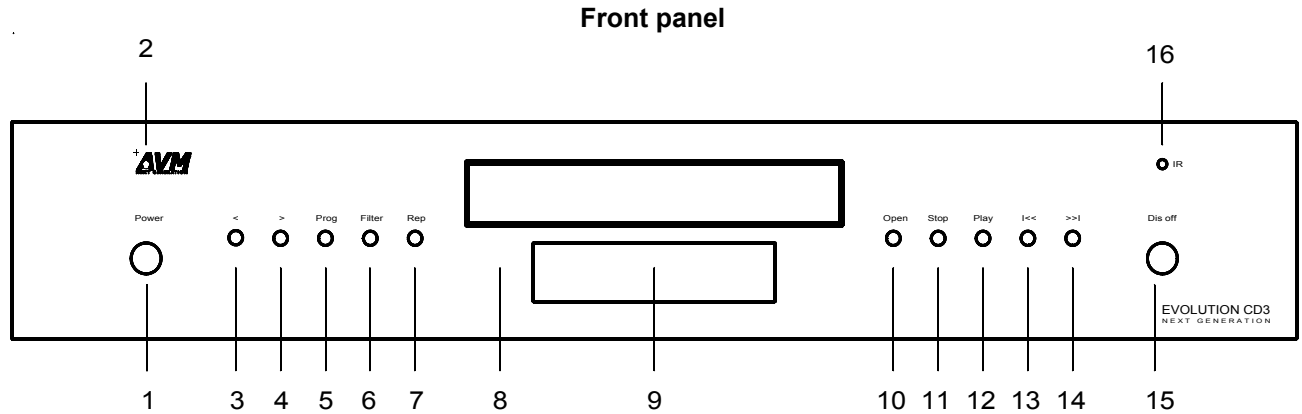
The second advantage of this differential technique is that the (very low) individual noise coming from the converters is reduced by 3 dBs.

The result is a clearly audible advantage in dynamic of the music signal and an audibly improved reproduction of the finest details.

2. Control elements and connectors

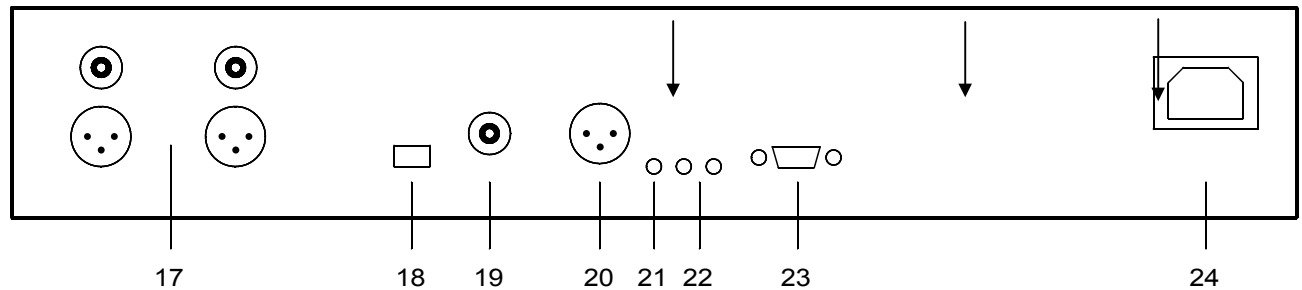
2.1 EVOLUTION CD3NG overview

The numbers in the drawings below mark the control elements. They refer to the numbers in the text, where the operation of the CD3NG is described.



- | | |
|---|--|
| 1. Button power (on / standby) | 9. Display |
| 2. LED (lights up, when unit is on) | 10. Button OPEN |
| 3. Button < (Filter, programming playlist) | 11. Button STOP |
| 4. Button > (Filter, programming playlist) | 12. Button PLAY |
| 5. Button PROG (Programming playlist, random) | 13. Button I<< (skip /search down) |
| 6. Button FILT (select filter) | 14. Button I>>(skip /search up) |
| 7. Button REP (repeat) | 15. Button DISPLAY OFF (while playing) |
| 8. Loader | 16. IR-Receiver |

Rear panel



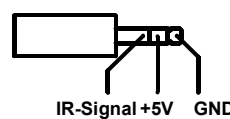
- | | |
|---------------------------------------|--|
| 17. Analogue outputs (RCA Cinch, XLR) | 21. Connector for external IR-receiver |
| 18. Dig out optical | 22. Communication ports (for future use) |
| 19. Dig out coax | 23. Serial port (for future use) |
| 20. Dig out AES/EBU | 24. Mains connector |

2.2 Connectors



XLR-outputs
(Analogue and digital)

1 = GND (Shield), 2 = non inverting, 3 = inverting



external IR-connector

2.3 Installation and cooling

The CD3NG doesn't produce much heat. You can put it in a rack as well as in a closet. Direct exposure to sunlight is not recommended because this will heat up the CD3NG.

2.4 Connection to mains

Connect the player to the mains outlet by using the power cord which is delivered together with the unit. Make shure that mains voltage is according to the value printed on the rear panel of the player (near mains connector). Let it be switched off until all audio connections are made.

2.5 Connection to an amplifier

The analogue outputs (17) of the CD3NG deliver fixed signal levels. Connect them to the high level inputs of a a preamp or integrated amp.

The RCA-cinch outputs and the balanced XLR outputs are fully decoupled from each other and can be used independently.

2.6 Connection to digital recorders / external DACs

Connect the digital outputs (14) to the inputs of your digital recorder or external D/A-converter.

CAUTION: Never connect the digital outputs to an analogue amplifier. The high frequencies can damage Your amplifier or loudspeakers.

REMARK: Thus the internal D/A-converter works with up to 192 kHz / 24 bits the CD3NG digital outputs send digital data with the fixed CDA-format 44,1 kHz / 16 bits.

2.7 External IR-remote control

The CD3NG can be connected to an external IR-receiver. Use the IR-Jack (21). The plug is a 3,5mm stereo headphone plug. Connect it according to sketch in chapter 2.2.

3. Basic operation

3.1 Switching on / standby

Using the button power (1) You can switch between on (operate) and stand by. In the on state the display (9) and the LED (2) light up. In stand by mode the display (9) is off and the LED (2) glows to indicate that the unit is still connected to mains.

CAUTION: When switched to stand by the unit is still connected to mains. In case of thunderstorm or if You leave the house for a longer time we recommend that You pull the mains plug.

3.2 Playable disc formats

The CD3NG can play all compact discs which are recorded according to the red book standard (means the standards for audio CDs established by PHILIPS and SONY). Furthermore all CDRs and CDR/Ws with good reflection recorded according to this standard are playable. Most copy protected discs are also playable. But we cannot take responsibility that all future copy protection systems are playable.

3.3 Insert / eject disc

Pressing the open button (10) opens the tray (8).

When the tray is open, it will close if You press the open button (10). Then the CD3NG reads the directory of the disc and shows the result in the display. This procedure can (depending on number of titles on the disc) last a few seconds.

Pressing the play button (12) will cause the same except that the CD3NG will immediately begin to play the disc after having read the directory. Before that it is possible to select a certain title using the skip buttons (13, 14) or the remote control.

NOTE: If the tray is blocked while moving in or out the display (9) will show "loader error, press open". Remove the cause for blocking and press the open button (10) again.

When the CD3NG is being transported, be sure that the loader is fully in. Otherwise the drive can be damaged.

3.4 Playing CDs (play, pause, stop, skip, search)

If a disc is inside the CD3NG You can start playing by pressing the play button (12). If You press play again the CD3NG will go into the pause mode until play is pressed a third time. Pressing stop (10) will stop playing. Using the skip buttons (13, 14) You can easily access any title on the disc. When You press one of the skip buttons for longer than a second while the CD3NG is playing a CD, it begins to play in fast forward or reverse mode.

The actual state of the CD3NG (PLAY, PAUSE, STOP) is shown in the display (9). Furthermore the display shows the actual playing time, the actual title number and the total number of titles.

3.5 Repeat

Press the repeat button (7) once to repeat the actual title, twice to repeat the whole CD or the programmed sequence. A third pressing makes the CD3NG returning to the normal playing mode.

3.6 Random play

Press the program button (5) and hold it for more than 2 seconds to play the CD in random sequence. Pressing stop (11) twice makes the CD3NG returning to the normal mode.

3.7 Programming an individual playlist

If a disc is inside the player You can program Your individual playing sequence as follows: Tip on the button program (5) for less than 1 second to enter the playlist-menu.

Pressing the < / > buttons (3, 4) allows You to select a title. Pressing the program button (5) stores the selected title in the playlist. If the playlist is completed you can start playing by pressing the play button (12).

Pressing stop (11) once stops the CD3NG but doesn't erase the playlist. Pressing stop (11) twice or opening the loader makes the CD3NG returning to the normal mode.

3.8 Select filter

Press the button filter (6) to select the filter characteristic You like most out of seven different settings. Chose the filter using the < / > buttons (3, 4). This function works as well in STOP and PLAY mode.

The different filters are:

192 kHz / 24 Bit / smooth, 96 kHz / 24 Bit / sharp, 96 kHz / 24 Bit / smooth, 48 kHz / 24 Bit / sharp, 48 kHz / 24 Bit / smooth, 44,1 kHz / 24 Bit / sharp, 44,1 kHz / 24 Bit / smooth.

The filter setting is according to your personal taste. The tonal results can vary depending on the recording mode of the CD.

3.9 Display off

Press the dis off button (15) to switch the display off while the CD3NG is playing. (Display will automatically light up in PAUSE and STOP mode). Press the button again to switch the display permanently on.

4. Remote control (option)

As accessories we offer different infrared remote control transmitters. Ask Your dealer.

5. Cleaning

Use a soft cloth and normal glass cleansing fluid.

CAUTION: Make sure that no fluid comes into the unit. Do not use scouring cleaners. They may damage the surface.

6. If something doesn't work.....

Some putative defects are often caused by mistakes in operation. Sometimes other units connected to the unit can cause problems. Therefore please read the following tips before You consult Your dealer or us.

Loader closes, but the CD is not recognized

The CD may be inserted upside down or the surface has to be cleaned.

No music although the display shows "play"

Check the cables to the amplifier.

Infrared remote control doesn't work

Check the batteries of Your remote control transmitter

Point with the remote control transmitter directly to the player.

7. Conditions of warranty (EC only)

If despite expectations a defect occurs that cannot be repaired by yourself or your dealer, we undertake the repair of your unit free of charge for up to two years from date of purchase. The warranty covers the costs of material and working time, transport costs are to be borne by the owner.

Provisions for this warranty are:

- The unit must have been purchased from an authorized dealer. Equipment from other sources will not be repaired, not even at charge.
- The warranty registration card, together with a copy of the bill of sale, must be received by us within four weeks of the date of purchase.
- The defect must not have been caused by improper handling or misuse.
- Return the unit to us only in its original packing. If this is not possible we are entitled to refuse acceptance. We will not assume responsibility for transport damage under any circumstances.
- A short description of the defect is to be included with the returned unit.
- In cases of doubt we reserve the right to request a copy of the bill of sale.
- We also reserve the right to levy a handling charge for items returned without good or valid reason, or if the unit proves to be not defective.

NOTE

If you are returning the unit from a country other than Germany you should ensure that correct export documents are obtained. We cannot accept any charges for costs arising from improper or incomplete export documentation.

If you have purchased your unit from a dealer outside Germany please refer to him or the relevant importing firm to process the warranty.

8. Technical data EVOLUTION CD3NG

Digital outputs

Data format	44,1 kHz / 16 bits
Output impedance RCA Cinch	75 Ohms
Output impedance AES/EBU	110 Ohms
Output voltages	according to IEC 958

Optical output	TOSLINK
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Analogue outputs

Output voltage	2,5 V
Output impedance RCA Cinch	50 Ohms
Output impedance XLR	150 Ohms
Frequency response	<10 Hz – over 20 kHz
S/N ratio	110 dB / 113 dB(A)
Power supply	AC 230 V / 50 - 60 Hz, 14VA (standby: 1 VA)
(Upon request	AC 115 V / 50-60 Hz)
Dimensions (w x h x d)	430 mm x 85 mm x 310 mm
Weight	5 kg (6 kg with chrome front)

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