

operating instructions

CD-player EVOLUTION CD3



AVM
NEXT GENERATION

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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1. Basic information about the CD3

The **EVOLUTION CD3** needs only a few elements to be operated. For basic operation You use only the knobs. The other settings (which are not often needed) can be accessed by the menu system (for example filter setting, playlist programming etc).

1.1 Mechanical construction

The case is fully made of metal. The audio-connectors are all gold plated to minimize electrical losses and provide long lasting perfect contacts.

1.2 Power supply

A switch mode power supply delivers clean, hum-free electrical energy for the digital and analog sections. All voltages 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 CD3 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 CD3. 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 produceces 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 CD3 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 convertional 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 height of the fluid surface 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 CD3 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 localisation 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 CD3 offers You five different filter characteristics. So You can choose Your favorite filter upon Your own taste.

1.4.4 Digital- / analogue conversion

The CD3 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.

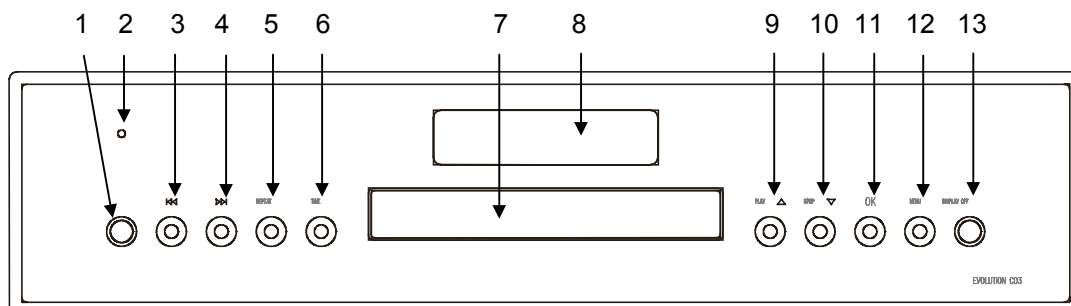
The second advantage of this differential technique is that the (very low) individual noise coming from the converters is reduced by 3 dBs.

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

2. EVOLUTION CD3 overview

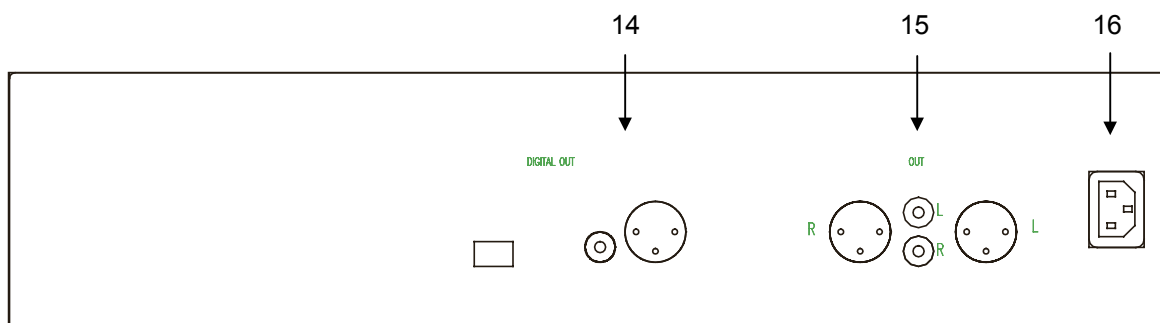
The numbers in the drawings below mark the control elements. They refer to the numbers in the text, where the operation of the **EVOLUTION CD3** is described.

Front panel



- | | |
|-------------------------------------|--|
| 1. Button power (on / standby) | 8. Display |
| 2. LED (lights up, when unit is on) | 9. Button \triangle / play / pause |
| 3. Button SKIP back | 10. Button ∇ / stop / eject |
| 4. Button SKIP forward | 11. Button ok |
| 5. Button REPEAT | 12. Button menu |
| 6. Button TIME | 13. Button DISPLAY OFF (while playing) |
| 7. CD-loader | |

Rear panel



- | | |
|----------------------|---------------------|
| 14. Digital outputs | 16. Mains connector |
| 15. Analogue outputs | |

2.1 Installation and cooling

The CD3 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 CD3.

2.2 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.

2.3 Connection to an amplifier

The analogue **outputs** (15) of the CD3 deliver fixed signal levels. Connect them to the high level inputs of 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.

2.4 Connection to digital recorders

Connect the digital outputs (14) to the inputs of Your digital recorder.

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

2.5 Data format of digital outputs

Thus the internal d/A-converter works wit up to 192 kHz / 24 bits the CD3 digital outputs send digital data with the fixed CDA-format 44,1 kHz / 16 bits.

3. Basic operation

All basic functions which are necessary for listening to music with the CD3 are accessible through the buttons on the front panel. More special functions can easily be handled by the menu system.

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** (8) and the **LED** (2) light up. In stand by mode the **display** (8) 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 CD3 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

While the unit is on pressing the **stop** button (10) opens the tray (7). If a disc is played You have to press the **stop** (10) button twice with a second of pause to open the loader.

If the tray is open it will close if You press the **stop** button (10). Then the CD3 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 (9) will cause the same except that the CD3 will immediately begin to play the disc after having read the directory.

NOTE: If the tray is blocked while moving in or out the **display** (3) will show "loader blocked, switch power off". In this case please remove the cause for blocking (for example a cd which is not properly inserted) and switch the unit off and on again using the **power button** (1).

Do not try to push or pull the tray by hand. This could cause damage to the mechanism inside the CD3. If the CD3 is transported make shure that the loader is fully in. Otherwise the drive can be damaged.

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

If a disc is inside the CD3 You can start playing by pressing the **play** button (9). If You press **play** again the CD3 will go into the pause mode until **play** is pressed a third time. Pressing **stop** (10) will stop playing.

The actual state of the CD3 (PLAY, PAUSE, STOP) is shown in the upper line of the **display** (8) by symbols. Furthermore the display shows the type of disc (CDA) and the playing time. The lower line shows the actual title number, the total number of titles.

Using the SKIP buttons (3/4) You can easily access any title on the disc.

4. The menu system

To access special functions (such as filter setting, programming etc.) You have to use the menu system. First some general informations about it:

The menu system consists of several levels, which sometimes have several sub levels. The actual level is shown in the display. In the upper line the actual level is displayed, in the lower line the selectable sub levels are indicated. Additionally the upper line shows on the right side the number of the actual menu level.

To enter the menu You have to press the button **menu** (12). You can then select the different points by pressing the buttons Δ or ∇ (9/10). To select a certain point You have to press the **ok** button (11). If there exists a sub menu this will be indicated by two or three dots following the actual menu name (for example: "playlist..."). To make settings You can use the **skip** buttons (3/4).

If You want to change to a higher menu level or exit the menu and change to normal operation mode You have to press the button **menu** (12) once or several times.

4.1 playlist

In this menu You can program number and sequence of the titles to be played.

4.1.1 playlist (sequence)

push the **menu** button (12) and select the playlist menu with the button **ok** (11). Then chose "1.1 playlist" with the buttons Δ and ∇ (9/10).

If a cd is in the drive the lower display line will show the title number of the actual title (first "001") and the total number of programmed titles (first "000"). The lower line of the display shows additionally the total playing time of the programmed sequence **plus** the playing time of the actual title. Now choose a title using the **skip** buttons (3/4) and confirm by pressing **ok** (11). Repeat this until the desired sequence is programmed. Press **menu** (12) twice to exit and return to the cd player mode.

If You press now the **play** button (9) the CD3 will play the programmed titles. If You press **stop** (10) once the player will hold the programmed sequence in memory and play it again if play is pressed. To cancel the programmed sequence press **stop** (10) twice. If You press **stop** for a third time the tray will open.

NOTE: While playing a programmed sequence the display of the CD3 will show the character "p" preceding the actual title number.

4.2 select filter

Here You can select the filter characteristic You like most out of five different settings. Push the **menu** button (12) and chose the filter menu with the buttons Δ and ∇ (9/10). Then select Your favourite filter using the **skip** buttons (3/4). If You do that while playing a CD You can control the result immediately. After having the filter set press **menu** (12) to exit and return to the cd player mode.

The different filters have the following characteristics: 1 = 192 kHz / 24 bits / sharp, 2 = 96 kHz / 24 bits / sharp, 3 = 48 kHz / 24 bits / slow, 4 = 44,1 kHz / 24 bits / sharp, 5 = 44,1 kHz / 24 bits / slow.

4.3 vfd brightness

Here You can set the display brightness. Push the **menu** button (12) and chose the brightness setting menu with the buttons Δ and ∇ (9/10). Then set the brightness from 25% to 100% using the **skip** buttons (3/4). Press **menu** (12) to exit and return to the cd player mode.

NOTE: Settings of 75% and 100% can lead to "burn in" of some display segments if the display is on for more than a few hours. Therefore we recommend that You switch Your player to standby for the times when You don't use it.

4.4 system ID...

Push the **menu** button (12) and chose the system ID menu with the buttons Δ and ∇ (9/10). Pressing the **ok** key (11) shows the identcode of Your player on the display. Press **menu** (12) to exit and return to the cd player mode.

4.5 factory setting...

Push the **menu** button (12) and chose the factory setting menu with the buttons Δ and ∇ (9/10). By pressing **ok** (11) You can reset the player to the factory setting (filter 1, brightness 50%). All individual settings are cancelled. For security reason You are asked to press **ok** (11) again before the reset procedure begins. If You don't want to reset the unit, press **menu** (12) to exit without resetting.

5. Remote control (option)

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

NOTE: The CD3 has a scan function (fast forward / fast reverse). This function is only accessible via the infrared remote control.

6. Cleaning

Use a soft cloth and normal glass cleansing fluid.

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

7. If something doesn't work.....

Some putative defects are often caused by mistakes in operation. Sometimes other units connected to the player can ause 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.

8. Technical data EVOLUTION CD3

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

Analogue section

Output impedance RCA Cinch	50 Ohms
Output impedance XLR	150 Ohms
Frequency response	5 Hz – over 20 kHz
S/N ratio	105 dB / 108 dB(A)
Power consumption	18 VA
Power supply	90 V - 265 V / 40 - 400 Hz
Dimensions (w x h x d):	430 mm x 114 mm x 315 mm
Weight	6 kgs

We reserve the right for changes without notice

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