

operating instructions

CD-player inspiration cd6



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.

AVM Next Generation Audio Technologies GmbH, Daimlerstraße 8, D-76316 Malsch
Website: www.avm-audio.com, E-mail: info@avm-audio.com

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1. Basic information about the cd6

The **inspiration cd6** needs only a few elements to be operated. For basic operation You use only the five buttons and the rotary encoder. The other settings (which are not often needed) can be accessed by the menu system (for example filter setting, level adjustment etc).

1.1 Mechanical construction

The case is fully made of aluminum. 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 high end computer drive. It can theoretically read CDs at 48 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 much lower speed. Besides normal audio compact discs the drive can also read CDRoms, CDRWs and MP3 coded discs.

The drive is mounted in a subchassis that insulates it from vibrations of the case. The tray is made of massive aluminum and mounted in four precise linear bearings.

1.4 Digital- / analogue conversion

The cd6 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 cd6. 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 cd6 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 converalional 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 cd6 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 cd6 offers You five different filter characteristics. So You can choose Your favourite filter upon Your own taste.

1.4.4 Digital- / analogue conversion

The cd6 uses two highly precise 24-bit converters per channel to reproduce the analogue signal out of the digital data. Two converters on the same chip are used to 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 are on the same chip, their inaccuracy is nearly the same and thus also nearly eliminated by the differential amplifier.

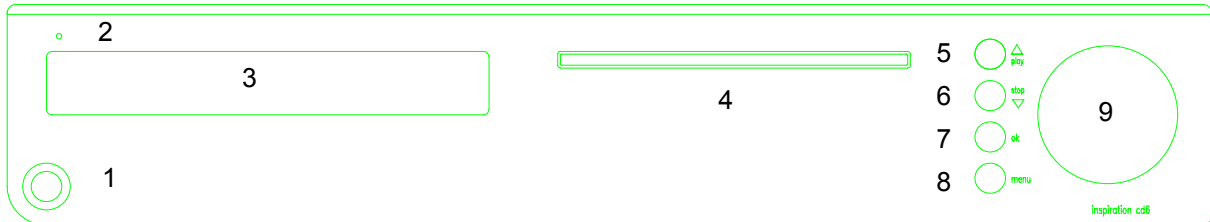
The second advantage of this differential technique is that the (very low) individual noise coming from the converters is reduced by 3 dBs.

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

2. inspiration cd6 overview

The numbers in the drawings below mark the control elements. They refer to the numbers in the text, where the operation of the **inspiration cd6** is described.

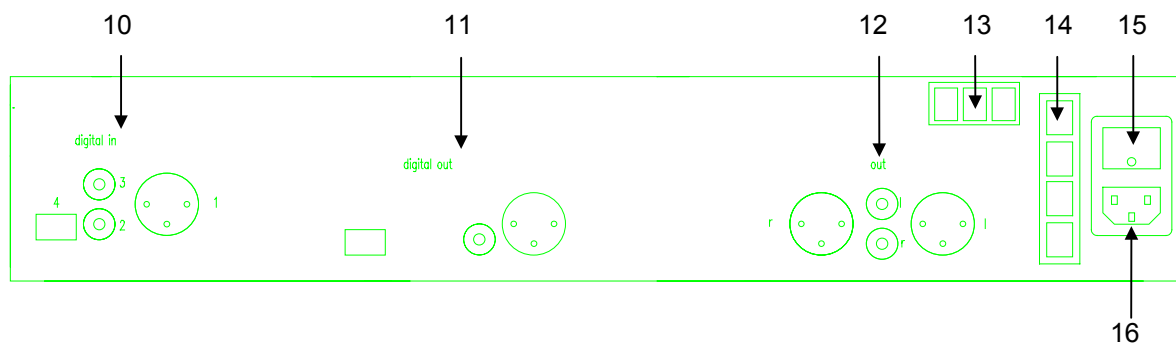
Front panel



1. Button power (on / standby)
2. LED (lights up, when unit is on)
3. Display
4. CD-loader

5. Button Δ / play / pause
6. Button ∇ / stop / eject
7. Button ok
8. Button menu
9. Rotary encoder

Rear panel



10. Digital inputs
11. Digital outputs
12. Analogue outputs
13. Remote outputs

14. Communication port (option, Germany only)
15. Mains switch
16. Mains connector

2.1 Installation and cooling

The cd6 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 cd6.

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** (12) of the cd6 can deliver fixed or variable signal levels. So You can connect Your player to a preamp, an integrated amp as well as to a power amplifier or active loudspeakers.

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 (1) 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 Connection of digital sources

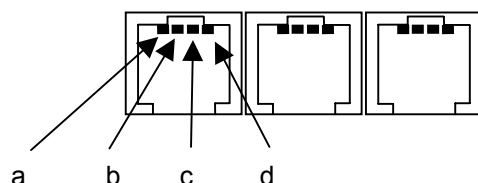
The cd6 is equipped with a state of the art d-/a converter. If You have other digital sources such as DAT-recorders, MD recorders, DVA tuners or even MP3 players with SP/DIF output. You can connect them to the digital inputs of Your cd6 and profit from it's outstanding musical qualities.

2.6 Data format of digital in- / outputs

the cd6 accepts and sends digital data from 44,1 kHz / 16 bits up to 192 kHz / 24 bits (optical connectors limited to 96 kHz).

2.7 Remote outputs

The three **remote outputs** (13) of the cd6 are connected in parallel. The output voltage is 5 Volts, the impedance is 15 kOhm. To make the connection use telephone connectors 4P4C. The contacts of the remote outputs are connected as follows:



a = Ground

b, c, d = + 5 V if a6 is on, 0V while stand by.

2.8 Communication port

only available for german models (planned for 2004)

3. Basic operation

All basic functions which are necessary for listening to music with the cd6 are accessible through the buttons and the rotary encoder 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** (3) and the **LED** (2) light up. In stand by mode the **display** (3) is off and the **LED** 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 switch the amplifier off by using the mains switch on the rear panel or pull the mains plug.

3.2 playable disc formats

The cd6 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 recorded according to this standard are playable.

MP3 coded discs can also be played if the sampling rate is 128 kHz or more. To get access to all recorded files the disc structure must follow some rules:

Disc must be recorded according to ISO 9660, level 1, mode 1 and must not contain Joliet extensions. The disc has to be single session and finalized. The maximum number of titles is 254. Directory names must be in 8.3 format.

Most copy protected discs are also playable. But we cannot take responsibility that all future copy protection systems are playable.

CAUTION: The drive spins with four times the normal speed when playing a CD. So we recommend NOT to use any accessories lying on the disc. Also shaped discs cannot be played.

3.3 Insert / eject disc

While the unit is on pressing the **stop** button (6) opens the tray (4). If a disc is played You have to press the **stop** button twice to open the loader.

If the tray is open it will close if You press the **stop** button (6). The the cd6 reads the directory of the disc and shows the result in the display. This procedure can (depending on disc) last a few seconds up to half a minute (if a MP3 disc with many titles on it is inserted).

Pressing the **play** button (5) will cause the same except that the cd6 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 cd6. If the cd6 is transported make sure 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 cd6 You can start playing by pressing the **play** button (5). If You press **play** again the cd6 will go into the pause mode until **play** is pressed a third time. Pressing **stop** (6) will stop playing.

The actual state of the cd6 is shown in the upper line of the **display** (3). Furthermore the display shows the type of disc (CDA or MP3) and the playing time. The lower line shows the actual title number, the total number of titles and in case of MP3 further informations (tile name, artist, album).

Using the **rotary encoder** (9) You can easily access any title on the disc.

3.5 Operation as a digital preamp, d-/a converter

The cd6 has four **digital inputs** (10) and can be used as a digital to analogue converter. The **analog outputs** (12) can be set to variable level (see 4.4 "output mode"). So You can connect the cd6 directly to a power amplifier or active loudspeakers and use it as a preamp (for digital sources only).

To access the dac- / preamp mode You simply have to press the **ok** button (7). To return to cd player mode press **ok** (7) again.

NOTE: If You have selected a digital input in dac- / preamp mode this input will stay active also in cd player mode until You select "cd" as signal source.

In the dac- / preamp mode the function of some knobs will change: the buttons Δ and ∇ (5/6) select the digital input (1 to 4 and cd). The **rotary encoder** (9) sets the output level (if output was set to variable before (see 4.4 "output mode")). The balance setting which is not often used is described in 4.5 "set balance".

In dac- / preamp mode the display changes. The upper line (from left to right) shows the selected source (cd, input 1 to 4), the selected filter (see 4.2 "select filter"), and the actual volume setting (0 to 99,5).

The lower display line shows information about the selected source. In case a digital input is selected: the sampling rate (for example "44,1 kHz" or "no signal").

If the built in cd drive is selected the state will be displayed by symbols: "CD ■ " means STOP, "CD ► " means PLAY and "CD ► || " means PAUSE. The lower line shows informations about the inserted disc: actual title number, total number of titles, in case of MP3 further informations (tile name, artist, album).

NOTE: in the dac- / preamp mode You cannot operate the drive functions. Before doing that You have to change to the cd player mode by pressing **ok** (7) once. After that You can change again to the dac- / preamp mode by pressing **ok** (7) a second time.

4. The menu system

To access special functions (such as filter setting, balance setting 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** (8). You can then select the different points by pressing the buttons Δ or ∇ (5/6). To select a certain point You have to press the **ok** button (7). 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 **rotary encoder** (9).

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** (8) once or several times.

4.1 playlist

In this menu You can program in one sub-menu number and sequence of the titles to be played. In the other sub-menu You can (in case of MP3) select the sequence in which the informations about titles (tile name, artist, album) will be displayed.

4.1.1 playlist (sequence)

push the **menu** button (8) and select the playlist menu with the button **ok** (7). Then chose "1.1 playlist" with the buttons Δ and ∇ (5/6).

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"). In case of CDA (normal audio CD) the display shows additionally the total playing time of the programmed squence plu the playing time of the actual title is shown. Now choose a title using the **roraty encoder** (9) and confirm by pressing **ok** (7). Repeat this until the desired sequence is programmed. Press **menu** (8) twice to exit and return to the cd player mode.

If You press now the **play** button (5) the cd6 will play the programmed titles. If You press **stop** (6) 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** (6) twice. If You press **stop** for athird time the tray will open.

NOTE: While playing a programmed sequence the display of the cd6 will show the character "p" preceding the actual title number.

4.1.2 id3 display

Here You can select the information of the ID3-tag of a MP3 disc which is first displayed. Push the **menu** button (8) and select the playlist menu with the button **ok** (7). Then chose "1.2 id3 display" with the buttons Δ and ∇ (5/6) . Select "track" (track number), "title" (name of title), "artis" or "album" and press **menu** (8) twice to exit and return to the cd player mode.

4.2 select filter

Here You can select the filter characteristic You like most out of five different settings. Push the **menu** button (8) and chose the filter menu with the buttons Δ and ∇ (5/6). Then select Your favourite filter using the **rotary encoder** (9). If You do that while playing a CD You can control the result immediately. After having the filter set press **menu** (8) 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 set dig out

Sets the data format of the digital outputs independent of the input signals (format converter). Push the **menu** button (8) and chose the dig out menu with the buttons Δ and ∇ (5/6). Then select the digital output format using the **rotary encoder** (9). Press **menu** (8) to exit and return to the cd player mode.

NOTE: For technical reason the optical inputs cannot deliver sampling rates of more tha 96 kHz. The sampling rate of 192 kHz is therefore only available on the RCA cibnch and AES/EBU outputs.

If Your recorder doesn't recognize title markers while recording a CD, set the digital output format to "1:1".

4.4 output mode

Here You can set the digital outputs to fixed or variable level. Push the **menu** button (8) and chose the output mode menu with the buttons Δ and ∇ (5/6). Then select the output mode (0dB fixed, -6 dB fixed or variable) using the **rotary encoder** (9). Press **menu** (8) to exit and return to the cd player mode.

CAUTION: If the cd6 is directly connected to a power amplifier or an active loudspeaker the music may be very loud if You select inadvertently a fixed level (0 dB 7 -6 dB). Thus we recommend that You switch the poweramplifier or the active loudspeaker off before setting the output mode.

4.5 set balance

Here You can set the balance of the analogue outputs. Push the **menu** button (8) and chose the balance setting menu with the buttons Δ and ∇ (5/6). Then set the balance from "<9" (most left), "0" (mid) to ">9" (most right) using the **rotary encoder** (9). Press **menu** (8) to exit and return to the cd player mode.

4.6 vfd brightness

Here You can set the display brightness. Push the **menu** button (8) and chose the brightness setting menu with the buttons Δ and ∇ (5/6). Then set the brightness from 25% to 100% using the **rotary encoder** (9). Press **menu** (8) 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.

4.7 system ID...

Push the **menu** button (8) and chose the system ID menu with the buttons Δ and ∇ (5/6). Pressing the **ok** key (7) shows the identcode of Your player on the display. Press **menu** (8) to exit and return to the cd player mode.

4.8 factory setting...

Push the **menu** button (8) and chose the factory setting menu with the buttons Δ and ∇ (5/6). By pressing **ok** (7) You can reset the player to the factory setting (filter 1, balance 0, output 0 dB fixed, brightness 50%, dig out 44,1 kHz/16 bits). All individual settings are cancelled. For security reason You are asked to press **ok** (7) again before the reset procedure begins. If You don't want to reset the unit, press **menu** (8) to exit without resetting.

5. Remote control (option)

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

NOTE: The cd6 has a scan function (fast forward / fast reverse). This function is only accessible via the infrared remot 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. Output level might inadvertently be set to "0" (see 4.4 output mode)

Infrared remote control doesn't work

Check the batteries of Your remote control transmitter
Point with the remote control transmitter directly to the player.

Recorder cannot separate the titles while recording (no title marks)

Set the digital output format to "1:1" (see 4.3 set dig out)

8. Technical data inspiration cd6

Digital outputs

Data format	user selectable 44,1 kHz / 16 bits up to 192 kHz / 24 bits (optical outputs only up to 96 kHz / 24 bits)
Output impedance RCA Cinch	75 Ohms
Output impedance AES/EBU	110 Ohms
Output voltages	according to IEC 958
Optical output	TOSLINK

Digital inputs

Data format	32 kHz / 16 bits up to 192 kHz / 24 bits (optical inputs only up to 96 kHz / 24 bits)
Input impedance RCA Cinch	75 Ohms
Input impedance AES/EBU	110 Ohms
Input voltages	according to IEC 958
Optical input	TOSLINK

Analogue section

Output impedance RCA Cinch	50 Ohms
Output impedance XLR	150 Ohms
Frequency response	depending on sample rate up to 90 kHz
S/N ratio	110 dB / 113 dB(A)
Power consumption	23 VA
Power supply	90 V - 265 V / 40 - 400 Hz
Dimensions (w x h x d):	430 mm x 95 mm x 380 mm
Weight	6 kgs

We reserve the right for changes without notice

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