

# DENON

AV Surround Pre-Amplifier

**AVP-A1HDCI**

Power Amplifier

**POA-A1HDCI**



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## AVP-A1HDCI

Power Amplifier

## POA-A1HDCI



Already 12 years have passed since 1995 when Dolby Digital + THX 5.1 was released and Denon became the first to support it in its AVP-8000 and POA-8300/8200 separate amps. Denon has continued to develop A/V surround amplifiers and receivers based on the basic design concept of "reproducing content with total fidelity to the original intent of the producer." With the advent of new high-definition formats and high-definition content, Denon's efforts have resulted in the development of an A/V surround pre-amplifier and a 10-channel power amplifier capable of faithfully reproducing high-definition video and high-definition audio and delivering top performance. As A/V Center devices with a diverse range of features, the AVP-A1HDCI and POA-A1HDCI are packed with all of Denon's best digital and analog technologies.



# AVP-A1HDCI

Reference Next Generation HD Control Center featuring Advanced Connectivity, Wi-Fi Network Audio Streaming and Finest Construction and Craftsmanship to bring you the Ultimate A/V Experience.

## State-of-the-art Denon Solutions for Maximizing Content Quality

**All new circuit layouts that shorten audio and video signal paths for best picture and sound**

The "simple and straight" design concept has been thoroughly implemented in the signal paths to contribute to immaculately clean audio and video playback. Signal paths are as short as possible to keep signal degradation in the audio and video circuitry to an absolute minimum.

**Fully separated Audio, Video, Pre-Amplifiers and Power Supplies allow for a cleaner and clearer signal path**

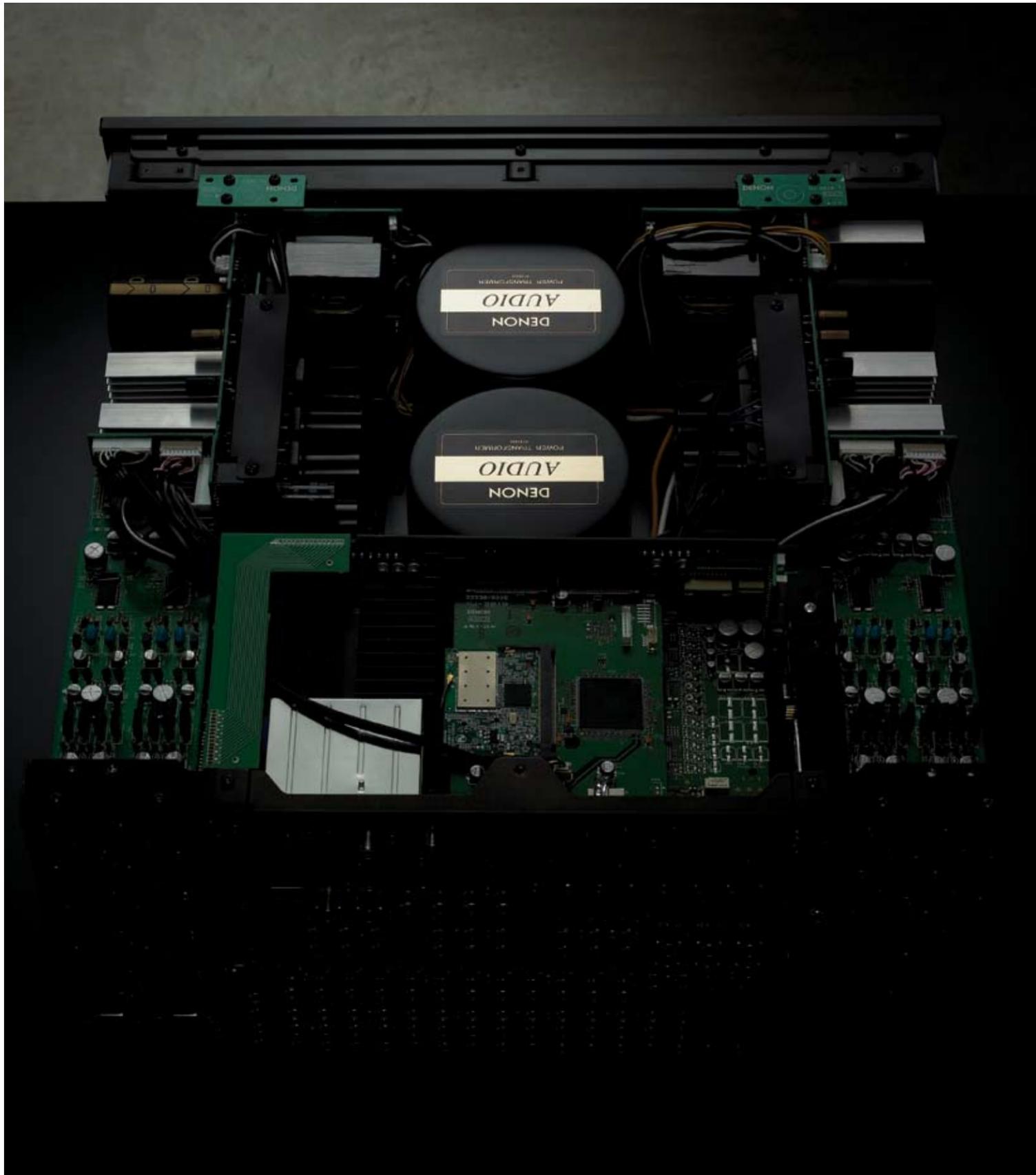
Dedicated transformers have been allotted for each block to prevent unwanted noise and produce a clean power supply circuit. One large toroidal transformer is used for the XLR output circuit and a second large toroidal transformer powers the analog audio circuit. Two transformers are used for the analog video circuitry; dedicated power supplies are provided for the display, CPU, digital audio circuitry, and digital video circuitry; and two are for the pre-amp section. The combination of these transformers, 50-ampere bridged diodes, four 10,000 microfarad block capacitors, and an ultra-robust power supply provides a stable source of power.

**Pre-amp, amplifier, and volume control in discrete configuration as a single component**

The AVP houses a low-impedance drive pre-amp, amplifier, and volume control unit in a discrete configuration as a single component. Since circuits configured of op-amps or similar devices used in general amplifiers do not have drive capability to withstand low impedance, distortion occurs under large current. This discretely configured pre-amp is capable of delivering distortion-free output thanks to its class-A operation capability up to low impedance. This circuit also requires a small number of elements, allowing output of pure audio signals of high S/N ratios and low distortion.

**Direct Mechanical Ground**

Vibration-resistant construction has been reviewed to thoroughly suppress the adverse influences of vibration on sound quality. The power transformers, a source of vibration, have been securely mounted on the highly rigid bottom chassis. Direct-mounting of cast-iron feet to the radiator in near proximity to each other serves to suppress mutual vibration with the power transformers and other sources of vibration. And careful mounting and placement of various parts has effectively eliminated the influences of external and internal vibration. This is all part of Denon's uncompromising design for impeccable sound quality.



**Discrete Devices for ultimate performance in each circuit block (D.D.S.C.-HD)**

The great appeal of a home theater is to be surrounded by dynamic, realistic sound and stunningly beautiful video images. In this age of high-quality 1080p video and high-definition audio, the core of Denon A/V surround sound technology has been the Dynamic Discrete Surround Circuit (D.D.S.C.). Now, Denon has developed the D.D.S.C.-HD circuit so that high-quality HD audio performance is on par with the high quality of video images. This new circuit masterfully embodies Denon's foremost design concept for A/V surround amps which is to "reproduce content with total fidelity to the original intent of the producer." The D.D.S.C.-HD reproduces with ideal quality the sound of the latest high-grade HD audio sources.

**Discrete Devices for ultimate performance in each circuit block**

**Dolby TrueHD and DTS-HD Master Audio decoders**

**Three All 32-bit floating point DSPs**

**Audio DACs in dual differential mode (1 per audio channel) on all output channels**

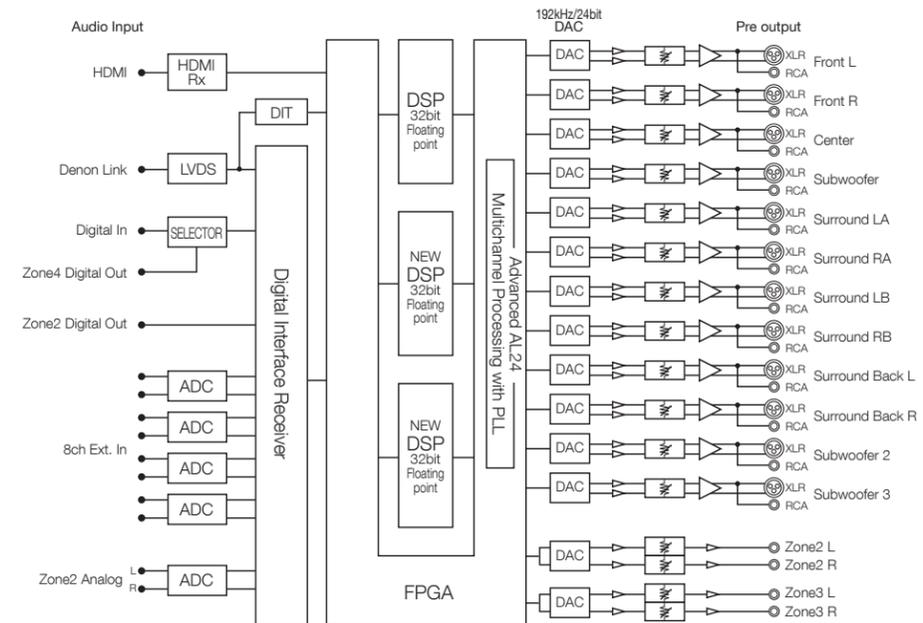
**Master clock design for more accurate processing and less jitter noise**

**Audio ADCs in differential mode (2 per audio channel) on all analog input channels**

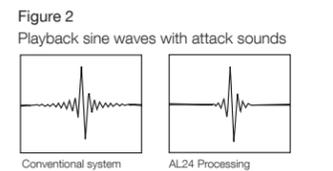
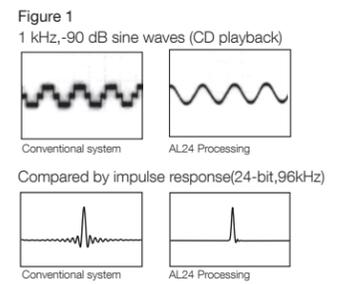
**DSP processing of EXT IN analog audio input is possible. Denon surround modes can also be enjoyed with external input audio signals.**

**Advanced AL24 processing provides more dynamic range**

In AL24 Processing, the internal processing circuit generates 8 lower bits of data which are added to the original 16 higher bits for 24-bit quality output. The circuit then interpolates the digital data so that it as closely as possible reproduces the smoothness of an analog waveform and allows recordings on CD or other digital media to sound the way they should in the natural world. Figure 1 shows the playback sine wave of conventional 16-bit data and how an audio signal that is only output in steps of one LSB is smoothed as if it were 24-bit data. Of course, these differences are also clearly audible: distortion that causes discomfort is reduced and the sound enjoys a superior S/N, free of noise. In addition, Advanced AL24 Processing uses proprietary high-speed signal detection technology and high-speed processing technology to perform high-sampling up conversion on the time axis and produce a sine wave that is even closer to that of an analog signal. Besides expanding the conventional number of bits, Advanced AL24 Processing uses high-speed arithmetic processing algorithms developed by Denon to observe and analyze sample groups of the original data and make interpolations associated with up sampling and frequency range expansion. Figure 2 shows the features of arithmetic processing. If we observe the sine wave of a relatively large attack signal assuming an actual music signal, we can easily see how different it is from conventional processing. While considerable ringing occurs with general FIR filters both before and after the attack signal, there is little ringing with Advanced AL24 Processing and we can see how well suited this technology is for the reproducibility of sine waves. Since greater efficiency in processing and higher processing capacity allow data samples to be processed in one stage across a wide range, signals can also be interpolated with greater accuracy compared to methods such as multi-stage configurations that use conventional digital filters. In addition, the over sampling rate has been boosted to 16fs from 8fs to facilitate the expansion of data volume that contains a more detailed, natural sound. The sonic result for the audiophile is the ability to enjoy musical recordings with the full ambience of the concert hall replete with its spaciousness and the movements of musicians.



AVP-A1HDCI AUDIO BLOCK DIAGRAM



## Master clock design

Various techniques have been adopted to boost the precision of the master clock and ensure meticulous accuracy in D/A conversion. These include stabilizing the power supply and ground potential, and minimizing the length of wires. In addition, by regenerating the master clock with a high-accuracy phase-locked loop (PLL) near the D/A converter, residual jitter is minimized, enabling playback of high-quality sound with clear sound images and contours.

## Denon Link 3rd

Denon Link is a jitterless digital interface that uses high-speed transmission devices for balanced transmission to achieve high-speed, high-grade real-time digital transmission with negligible signal degradation. When connected to a DVD player, Denon Link enables direct digital input of PCM 24-bit/192-kHz digital signals and other high-speed, high-sound-quality multi-channel signals from such sources as DVD-Audio and Super Audio CD.

## To preserve original sound quality for the room's acoustics at any volume level, Audyssey Dynamic EQ loudness correction technology

Dynamic EQ corrects frequency responses at any volume level while considering such aspects as the measured characteristics of the room, volume of the source, and the characteristics of human ears. Even when the volume is turned down, it is possible not to sense weakness in sound or insufficient dynamism.

## Refined calibration technology to improve an acoustical condition of any room

New tower type microphone is used to measure the characteristics of the speakers and the listening room. The data is analyzed by a high-performance DSP, and the Auto Set-up function automatically makes initial settings for the speakers. The newly improved MultEQ XT technology then processes acoustic data obtained from up to 8 listening positions, and the Room EQ (Equalizer) function corrects the frequency response to achieve the optimum listening environment for the room.

-New filtering ALFC (Adaptive Low Frequency Correction) for higher resolution processing in the low frequency band

## The following 6 basic settings are automatically made for the speakers:

1. Speaker connection
2. Speaker size
3. Speaker level
4. Speaker distance
5. Speaker phase
6. Cross-over frequency

## Room EQ

By measuring multiple listening positions, up to a maximum of 8, frequency response for the overall listening area is automatically corrected. During Auto Set-up, minute corrections are made in each speaker by an FIR filter which in theory has no phase variation. There are three correction patterns: Audyssey, Audyssey Byp. L/R, and Audyssey Flat. Manual setting is also possible using a 9-band graphic equalizer. During manual setting, it is possible to make settings while listening to your favorite music.

Since 4 correction patterns including manual setting can be assigned to each surround mode, corrections for the overall listening area can easily be set for each source.

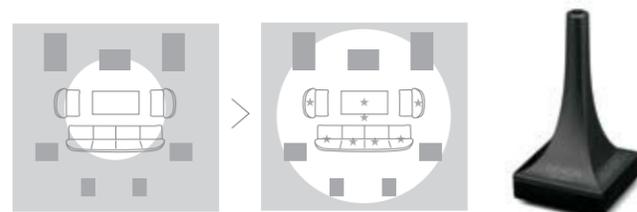
Audyssey: Corrects the frequency responses of all speakers to optimum levels.

Audyssey Byp. L/R: Corrects the frequency responses of all speakers except the front L/R speakers.

Audyssey Flat: Corrects frequency responses so that they are all uniform.

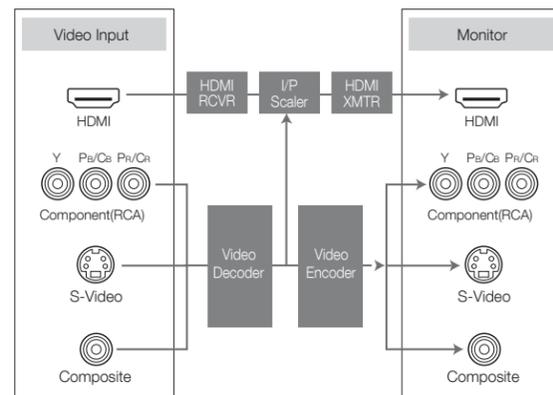
Manual: Manually adjusted frequency responses are applied. Off: Room EQ is not used.

Manual: Manually adjusted frequency responses are applied. Off: Room EQ is not used.



## Denon's High Picture Quality Circuitry, to enhance enjoyment of existing DVDs

This circuitry employs an I/P (Interlaced/Progressive) converter - also vital for audio circuitry - and a Realta sX2 scaler that converts the SD video images of DVD to high-definition 1080p images. High conversion performance is made possible by 10-bit processing, and motion detection is dramatically improved as well. Regularity at the pixel level not only for the 3:2 pattern of film sources but also for other patterns is accurately detected at high speed for highly precise I/P conversion. Even when a source contains both Video mode and Film mode material, each mode is accurately detected and processed at high speed, enabling high-quality Progressive playback of a variety of DVD discs. The Realta sX2 also functions as a high-performance scaler that makes 1080p HDMI output possible. 10-bit processing enables high-precision scaling, and the most appropriate conversion for the output resolution is performed even when video signals recorded on a DVD using color difference signals are output in RGB format. As a component dedicated to playback, the sole job of the AVP-A1HDCI is to ensure that A/V enthusiasts can enjoy a rich variety of DVDs in superior picture quality.



## Digital Noise Reduction, to optimize effects for both SD and HD content

This DNR technology optimizes the effects of high-definition Blu-ray video as well as standard DVD discs.

## Denon Pixel Image Correction, for more natural correction of curved lines

The AVP-A1HDCI is endowed with Denon Pixel Image Correction enhancer technology to perform high-definition video image correction. 10-bit processing is used to detect and correct curved lines with greater precision. The new enhancement processing algorithm considers the effects of peripheral pixels in addition to the target pixels, sampling and analyzing video data of a total of 9 pixels. Pixels in horizontal, vertical, and diagonal directions are detected and processed in detail. Brightness and Color signals are also processed by the same algorithm which then suppresses ringing noise that easily occurs during enhancement and performs other processes to effectively produce a vivid, natural picture.

## Detailed picture quality adjustability

Besides the Denon Pixel Image Correction functions, picture quality can be adjusted over a wide range of elements including not only Contrast and Sharpness but also White level, Chroma level, Noise Reduction settings, and Gamma.

## HDMI (ver. 1.3a supporting Deep Color (30/36-bit), "x.v.Color", High-Bit-Rate Audio input)

The HDMI input/output ports permit digital transmission of video and audio signals over a single HDMI cable. Since the latest version of this interface is provided, the AVP-A1HDCI supports a variety of specifications, such as Deep Color (30/36-bit), "x.v.Color", Lip Sync, High-Bit-Rate Audio, and HDMI Control.

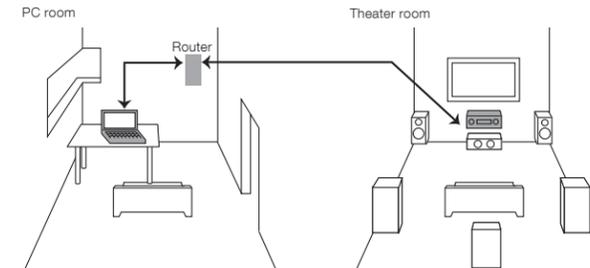
## Connectivity & Future-ready Expandability

### Network Audio and Photo Streaming

The AVP-A1HDCI includes a wireless LAN function. A music server such as Windows Media Player ver.11 can be used via a LAN connection to play music files stored on a PC. Supported audio file formats are MP3, WAV (linear PCM), AAC (DRM not supported), WMA, and FLAC. (The AVP-A1HDCI's music server function complies with Digital Living Network Alliance [DLNA] specifications.)

### Internet Radio

You can access a list of over 7,000 radio stations via "vTuner" service, and enjoy your favorite music channels without a PC.



### Compressed Audio Restorer to enhance digital music files

Compressed Audio Restorer is Denon original audio technology that interpolates audio information that has been lost during suppression of audio files downloaded from the Internet or for digital audio players, and plays the powerful low range and the delicate details in the high range of these files without sacrificing the overall balance of sound.

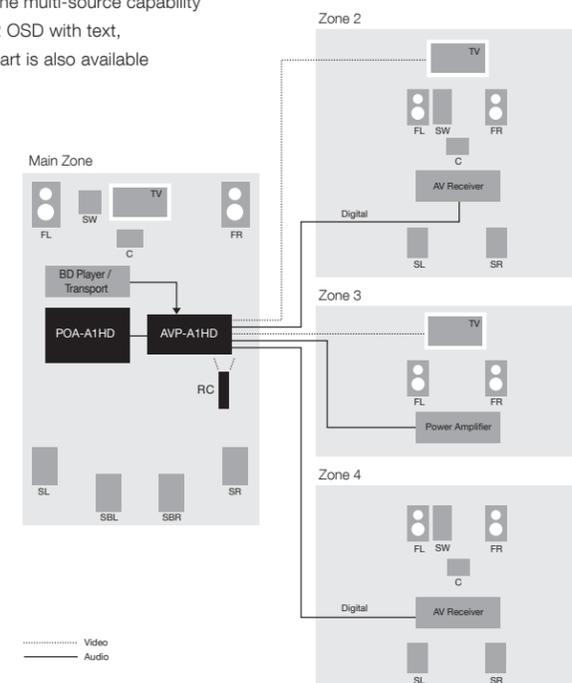
### Music streaming from the Rhapsody music service site

### XM Ready, HD Radio built-in

### AM/FM Radio built-in

### Multi-Zone Capabilities

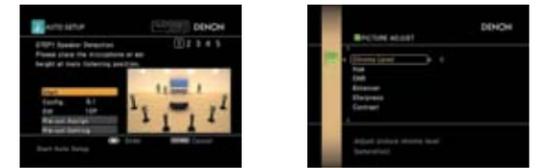
- Three analog and one digital, four zone multi-source capability
- Zone 2 OSD with text, Album art is also available



## Ease-of-Use

### New user interface for easy operation, setup and digital media browsing

The newly-developed graphical user interface (GUI) supports displays in multiple languages to vastly improve operating ease and use.



### GUI-assisted operation even during 1080p output from HDMI

### Dual HDMI outputs enabling simultaneous output to video projector and flat panel

There are 2 HDMI outputs that can be used simultaneously. It is possible, for instance, to connect one to a video projector and the other to a flat panel display.

### 2-line fluorescent display on front panel

Current status, such as the input source or audio format, is displayed in two lines. It is also possible to check the name of the album or music track of the memory audio or other items without viewing the TV screen. The 2-line display also makes it possible to easily change settings without the GUI and TV screen.

### Audyssey Pro Installer Ready

### Web setup, save and load all settings via Ethernet

Browser software on a PC can be used via network connection to set up or control the AVP-A1HDCI.

### Remote control unit with GLO-KEY buttons for easy operation in the dark

### Sub-Remote controller

The AVP-A1HDCI comes with a sub-remote controller in addition to the main remote controller. Since the sub-remote controller has buttons that operate frequently-used functions, this controller can be used for simple operations. The sub-remote controller can also be used in multi-zone setups, to operate the AVP-A1HDCI from another room.

### Sub-remote controller functions:

- Input source switching
- Volume adjustment
- iPod® operation
- Direct play of NET/USB
- Operation of GUI menus and Zone 2 on-screen displays
- Power ON/OFF for individual zone.





## Other Features

THX Ultra2 certified

Pure Direct mode, for enjoying high-quality pure audio

Pure Direct mode allows listeners to enjoy the pure, impeccable high sound quality of music. When Pure Direct mode is activated, the fluorescent display is turned off and unused circuitry automatically shuts down. It is also possible to turn off power to the video and digital circuits to further improve sound quality.

Auto Surround Mode, to automatically remember surround modes for 4 input signal formats

Surround modes or surround parameters can be automatically stored for each of 4 types of input signals: 2-channel analog/PCM, 2-channel digital, 5.1-channel digital, and multi-channel. If the type of input signal is changed, the optimum surround mode is thus automatically set for that signal.

Supports connection of up to 3 subwoofers

When as many as 3 subwoofers are connected, it is possible to select MIX or L/R channels. THX-compliant modes can also be selected.

Night mode for low-volume listening, and Dolby Headphone for enjoying surround sound with headphones

1080/24p pass through (via HDMI)

Analog video to HDMI scaling up to 1080p

12-bit/216-MHz video encoder and decoder with NSV

iPod audio, photo and video playback (optional ASD-1R/3N/3W)

A separately-sold Denon control dock for the iPod can be connected to listen to music or view video stored on the iPod.

Mass storage support USB for audio and photo playback (MTP compatible)

Album art support (iPod/Network/USB)

Title text (iPod/Network/USB/XM/HD radio)

Multi language support (EN, DE, FR, IT, ES, NE, SV, JP)

Dual component outputs for main zone

BNC connectors for component input/output

Supports HDMI Control (Consumer Electronics Control)

When connected via HDMI cable to a TV or player that supports HDMI Control, it is possible to use the TV's remote control unit to perform such operations as turn power on or off, switch functions, or adjust the volume. (Note: This may not work with some devices or settings.)

IR Remote in/out ports

+12V, 250mA trigger x 4 outputs

RS-232C control x 2

Optional RC-7000CI/7001RCI 2-way control ready

When combined with the separately-sold RC-7000CI RF remote controller or RC-7001RCI remote receiver, bi-directional communication is possible between the AVP-A1HDCI and the RC-7000CI. It is also possible to select files for playback from a list displayed on the remote controller's screen.

## Input / Output terminals

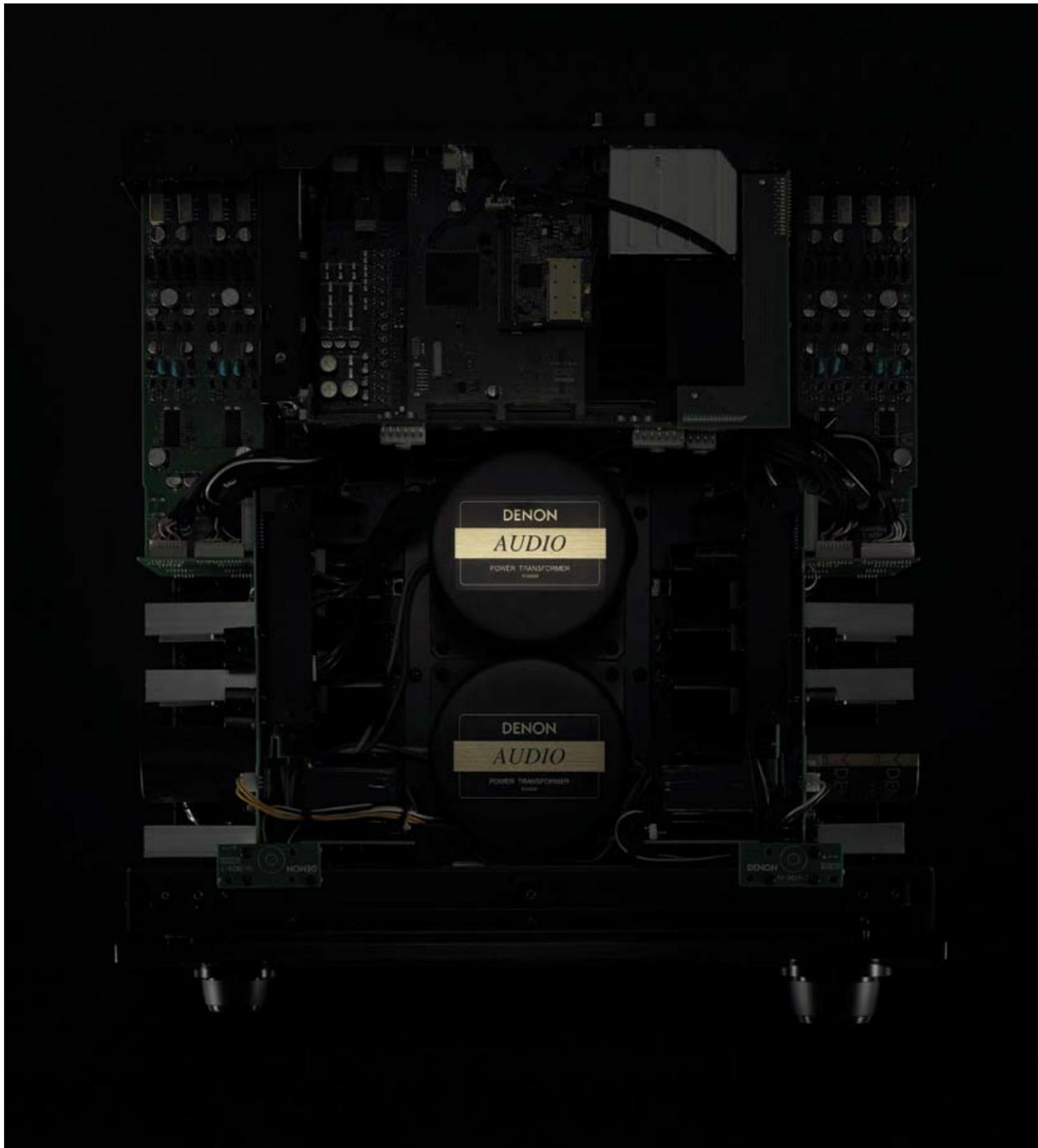
IN	HDMI	6	
	Component	6 (1: BNC)	
	S-Video	8	
	Composite	8	
	XLR	1	
	Analog audio	10	
	EXT. In	7.1ch	
	Digital OPT	5	
	Digital COAX	6 (2: BNC)	
	Denon Link 3rd	1	
OUT	HDMI monitor	2	
	Component	main monitor 2 (1: BNC) Zone 2 monitor 1	
	S-Video	REC 3 Monitor / Zone 2 1 / 1	
	Composite	REC 3 Monitor / Zone 2 1 / 1 Zone 3 1	
	Analog preout	9.3 ch XLR (Balanced)	
	Analog preout	9.3 ch RCA (unbalanced)	
	Analog audio	REC 3 Zone 2 / Zone 3 1 / 1	
	Digital optical	REC 2 Zone 2 1 REC / Zone 4 1	
	Others	Trigger +12 V, 250 mA	4
		RS-232C	2
Control link		1	
HD Radio DTU Antenna AM/FM		1/1	
Tuner antenna AM/FM		1/1	
Remote IN/OUT		IN 1 / OUT 1	
Ethernet		1	
Wi-Fi (WLAN Antenna)		1	
USB		2	
Dock control		1	
SAT TU XM		1	
Setup mic		1	

## Specifications

<b>Pre-amplifier Section</b>	
Input sensitivity/impedance	
PHONO(MM)	2.5 mV
Audio inputs	RCA (unbalanced) 200 mV/47 kohms XLR (balanced) 400 mV/100 kohms
Output level/Load impedance	
Audio outputs	RCA (unbalanced) 1.2 V XLR (balanced) 2.4 V
<b>FM Section</b>	
Tuning frequency range	87.5 - 107.9 MHz
Usable sensitivity	1.0 V (11.2 dBf)
<b>AM Section</b>	
Tuning frequency range	520 - 1710 kHz
Usable sensitivity	19 V
<b>General</b>	
Power supply	AC 120 V, 60 Hz
Power consumption	2A (Standby: 0.3 W)
Dimensions W x H x D	17-3/32" x 8-27/64" x 19-7/32" 434 x 214 x 488 mm
Weight	59.1lbs, 26.8 kg

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AVP-A1HDCI



POA-A1HDCI



# POA-A1HDCI

Reference 150 Watts x 10 channel Fully Configurable Power Amplifier

## State-of-the-art Denon Solutions for Maximizing Content Quality

### 4 Ohms Guaranteed Mono Block Construction Amplifiers

The POA-A1HDCI is a 10-channel high-output power amplifier with 300 watts (4 ohm) of uniform-quality current for each channel. To ensure maximum performance as an audio amplifier, this model has been designed with a discrete monaural configuration where each channel is endowed with its own parts and radiator. Interference between channels has been eliminated to produce highly pure sound with a realistic sound space.

150 W x 10 channels (8 ohms), 300 W (4 ohms)

300 W Bridgeable derive (8 ohms), 500 W (4 ohms)

10-channel power amp capable of driving low-impedance speakers

THX Ultra2 certified Power Amplifier

Fully separated construction for each 10 channels for all same audio quality

Mono block concept to amplify with best performance

Separate winding in power circuit for each channel

New amplifier circuit that shortens audio signal paths for the best audio

Direct Mechanical Ground to minimize mechanical vibration from transformer and radiators

8 individual transformers to supply power to each discrete circuit

4 main power transformers to drive 10 ch power amplifiers with separated coil winding for pure audio playback

The main power unit for the power amp is configured of four large transformers dedicated to the power amp section, large-capacity block capacitors, and large-capacity rectifying diodes, to provide a stable supply of current from the main power supply block. This highly reliable current allows listeners to freely enjoy high-quality sound even during dynamic playback of surround sound or multi-channel sources. The power unit also has two independent pairs of large transformers, one for each stereo channel, and each channel is independently configured from a secondary coil on each transformer to suppress interference between circuits and ensure superior sound quality.

High current diodes and capacitors to drive bridged speakers Multi-Zone Capabilities



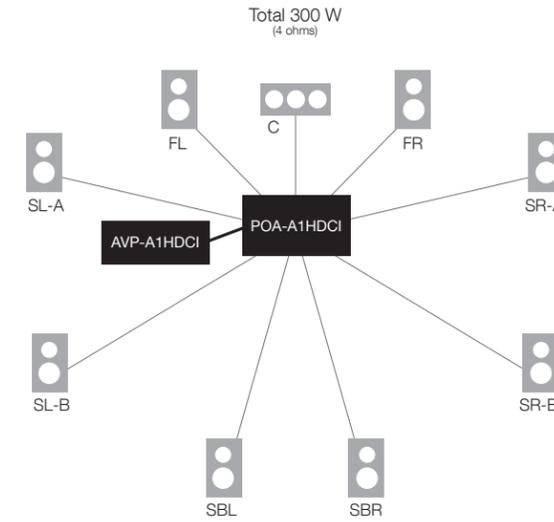
**All channels of power amp can be assigned to various locations**

The AVP-A1HDCI with 10 pre-amp channels is equipped with a power amp assignment function capable of taking efficient advantage of the POA-A1HDCI's power amp to support a variety of situations in the listening environment. Since the 10 speaker terminals can be freely assigned to any channel, the combination of one AVP-A1HDCI and a POA-A1HDCI permits the enjoyment of home theater entertainment in a variety of environments. The front channels can also be used as a bi-amp, or as a bridged connection for higher power output through a single channel. You could also purchase two POA-A1HDCI power amps to bridge-connect 10 output channels that would let you enjoy incredible dynamism on the level of a movie theater.

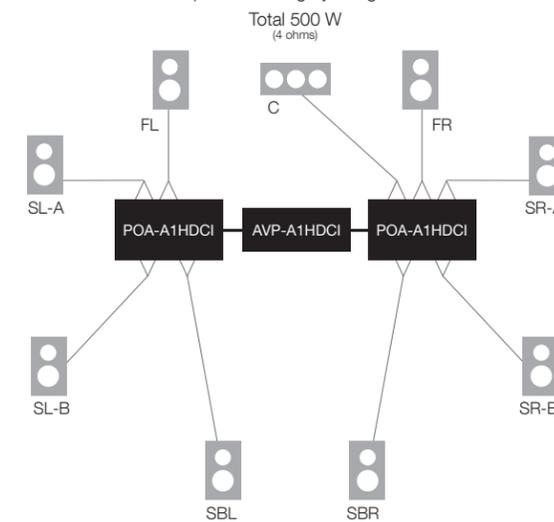
One example is given below:

1. Serious dynamism of a 9.1(+0.2)-channel surround system for one room
2. 5.1-channel second zone theatre: Enjoy 5.1-channel theatre environments in two rooms
3. Multi-zone system: Divide 10 channels of output to make a 7.1-channel theatre for the main room, a 2.1-channel environment for a second room, and a monaural environment for a small third room
4. Bi-amp system: In a 7.1-channel theatre environment, bi-wire-connect two front speakers (L/R) and a centre speaker to give a big boost to playback quality from the front.

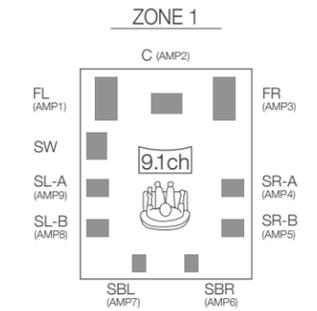
Case 1 9ch Speaker Setting by Normal Connection



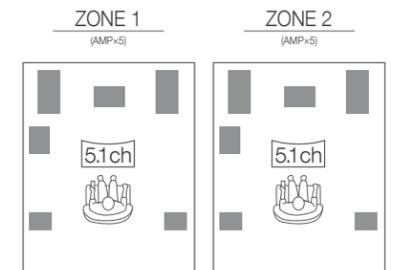
Case 2 9ch Speaker Setting by Bridgeable Connection



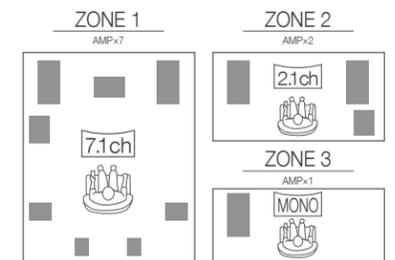
1.



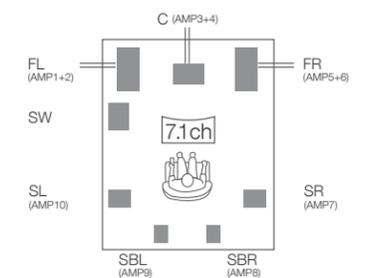
2.



3.



4.





## Ease-of-Use

Control Link allowing POA-A1HDCI settings to be made via the AVP-A1HDCI remote control unit (includes Control Link Cable: 10 ft)

With the POA-A1HDCI, it is possible to switch among XLR, RCA, and OFF for the input signals and among Bi-Amp, NORMAL, and BRIDGE for the types of output, for each channel. The POA-A1HDCI is also equipped with Control Link to enable communication with the AVP-A1HDCI. When connected with a Control Link Cable, these settings can be made using the remote control unit that comes with the AVP-A1HDCI. (When the POA-A1HDCI is used on its own, switches on the rear panel is used to change the settings.)

VU meters available of any channel

## Other Features

RCA and XLR input for each channel

Bi-Amp / Bridge mode select

Bridged or bi-amp connections are possible by setting a switch on the rear panel that will enable the connection of a 2-channel unit to a single-channel input. Settings are made individually for each channel so that the front and centre channels can be bridged and the surround and back surround channels can be used singly. During linked control from the AVP-A1HDCI, the connection method can be selected from the AVP-A1HDCI's remote controller.

Gold plated wide pitch speaker terminal

Trigger input

RS-232C

## Input / Output terminals

IN	XLR EXT.	10
	RCA	10
OUT	Speaker A L/R out	10
	Speaker B L/R out	10
Others	Trigger +12 V, 250 mA	1
	RS-232C	1
	Control link	IN 1 / OUT 1

## Specifications

Power Amplifier Section	
Rated output	150 W (8 ohms) 300 W (4 ohms) 300 W (8 ohms) Bridge Connection 500 W (4 ohms) Bridge Connection

General	
Power supply	AC 120 V, 60 Hz
Dimensions (W x H x D)	17-3/32" x 11-1/16" x 20-55/64"
Weight	434 x 281 x 530 mm 132 lbs 4 oz, 60kg

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