

# Accuphase

MDS SA-CD PLAYER

## DP-600

- High-grade SA-CD/CD drive
- Innovative MDS digital signal processing
- MDS++ type D/A converter using six parallel devices
- "Direct Balanced Filter" with totally separate balanced and unbalanced signal paths
- HS-Link digital interface
- Transport outputs and digital inputs allow insertion of DG-48 into signal path for sound field correction
- Balanced and unbalanced analog outputs





**High-end integrated SA-CD/CD player — High-grade SA-CD/CD drive combined with exquisite disc tray and ultra-quiet disc loading mechanism ensures smooth operation. Innovative MDS (Multiple Double Speed DSD) digital signal processing circuitry is configured as moving average filter for straight D/A conversion. Completely separate configuration of transport and processor sections, each equipped with a set of HS-Link, coaxial, and optical connectors.**

The reference-level separate-type combo DP-800/DC-801 and the integrated DP-700 with their exclusive mechanism developed in-house by Accuphase have garnered high praise and acclaim the world over. The new DP-600 is positioned as a companion model to the DP-700, benefiting from its sophisticated know-how, but it is also a high-end integrated SA-CD player in its own right. Extensive listening tests were conducted to ensure optimum reproduction quality. As with all Accuphase players so far, a conscious decision was made not to support multi-channel formats but rather focus on obtaining the ultimate in musical fidelity from two-channel SA-CD music sources.

The high-grade SA-CD drive mechanism in the DP-600 is the ultimate tool for extracting the information on SA-CD discs one hundred percent. It not only keeps internal vibrations of rotating parts to a minimum, but is also highly impervious to external vibrations. This ensures that the digital signal remains in a highly pure and accurate state. A dedicated DSP chip controls the digital servo, allowing the digital signal encoded on the SA-CD in DSD (Direct Stream Digital) format to be processed with utmost accuracy. The high-speed access mechanism with its single-lens/twin laser diode combines optimum precision with lightning-swift operation.

In the digital processor section, ground-breaking MDS (Multiple Double Speed DSD) technology is used, with an ultra-high-speed FPGA (Field Programmable Gate Array) and multiple DACs driven in parallel to handle the delayed DSD signal. After D/A conversion, summation of the multiple data results in an ingenious moving-average filter circuit that implements straight D/A conversion of the DSD signal. An important characteristic of MDS is the use of MDS++ D/A converters which keep conversion errors to an absolute minimum. The MDS circuit acts as a high-cut filter that virtually eliminates high-frequency quantization noise.

### Features and Functions of Transport Section

#### High-grade SA-CD/CD drive

- ① Highly rigid and precise construction with sturdy, heavyweight chassis to absorb external vibrations
- ② "Traverse Mechanism" with floating design
- ③ Massive bridge cover
- ④ Non-resonant design and low center of gravity further reduce vibrations
- ⑤ High-quality disc tray extruded from an aluminum block, plus super-quiet smooth disc loading mechanism

#### SA-CD/CD transport outputs ultra pure digital signal

#### Single-lens/twin pickup high-speed access mechanism

#### Support for text data display

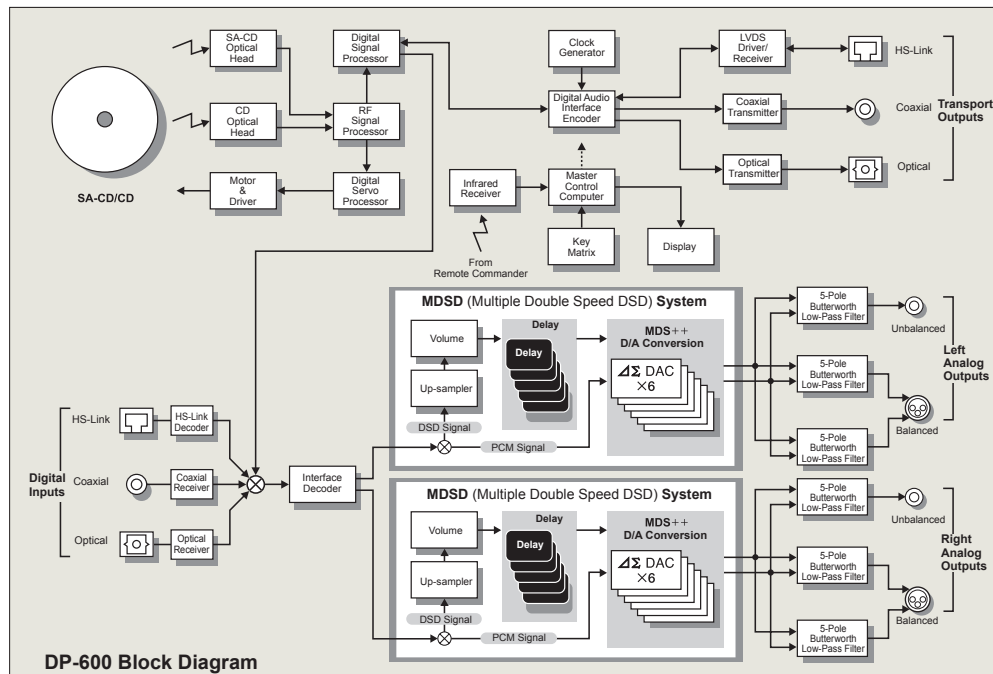
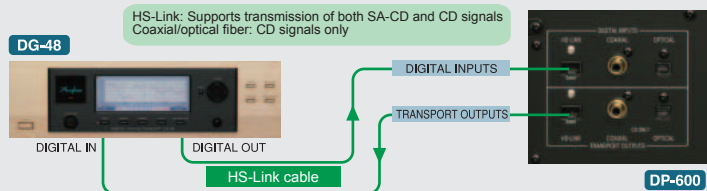
#### Accuphase's proprietary digital audio interface HS-Link (carries both SA-CD and CD signal)

High-grade SA-CD/CD drive



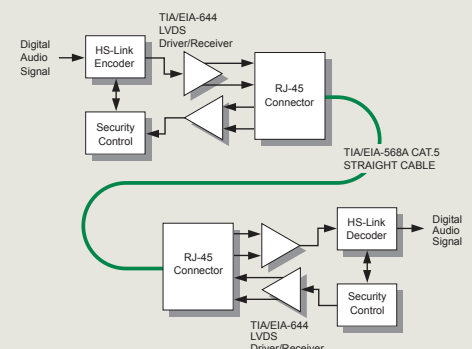
### DG-48 connection example

The DG-48 can be connected between the transport outputs and digital inputs of the DP-600 (using HS-Link, coaxial, or optical connection). This allows sound field compensation of the signal from the CD transport in the digital domain.



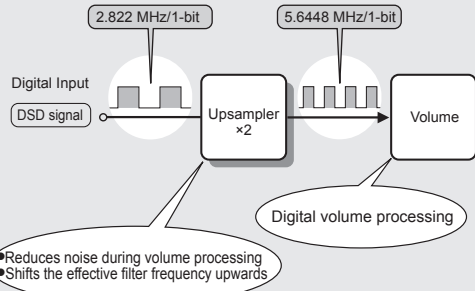
### Accuphase Exclusive Digital Interface HS-Link: High Speed Link

HS-Link is an ultra high-quality digital audio interface developed by Accuphase using latest digital signal transmission technology. It supports send/receive verification for copyright protection. The LVDS (Low Voltage Differential Signaling) principle allows a single dedicated HS-Link cable to transmit all audio data with utmost fidelity, including 2.8224 MHz/1-bit and 192 kHz/24-bit signals.



HS-Link Block Diagram

# Innovative Digital Signal Processing: MDSD (Multiple Double Speed DSD)

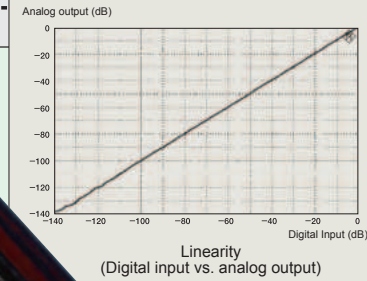
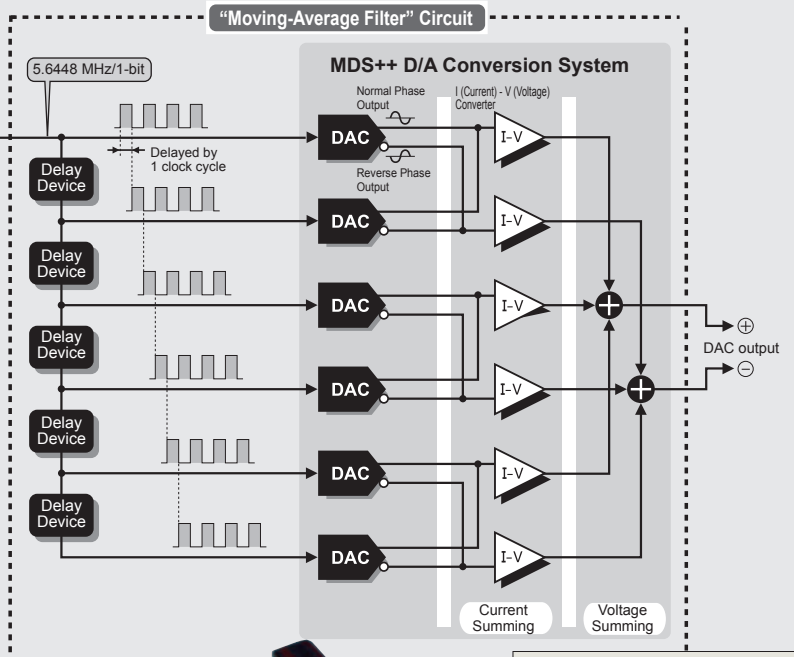


- Reduces noise during volume processing
- Shifts the effective filter frequency upwards

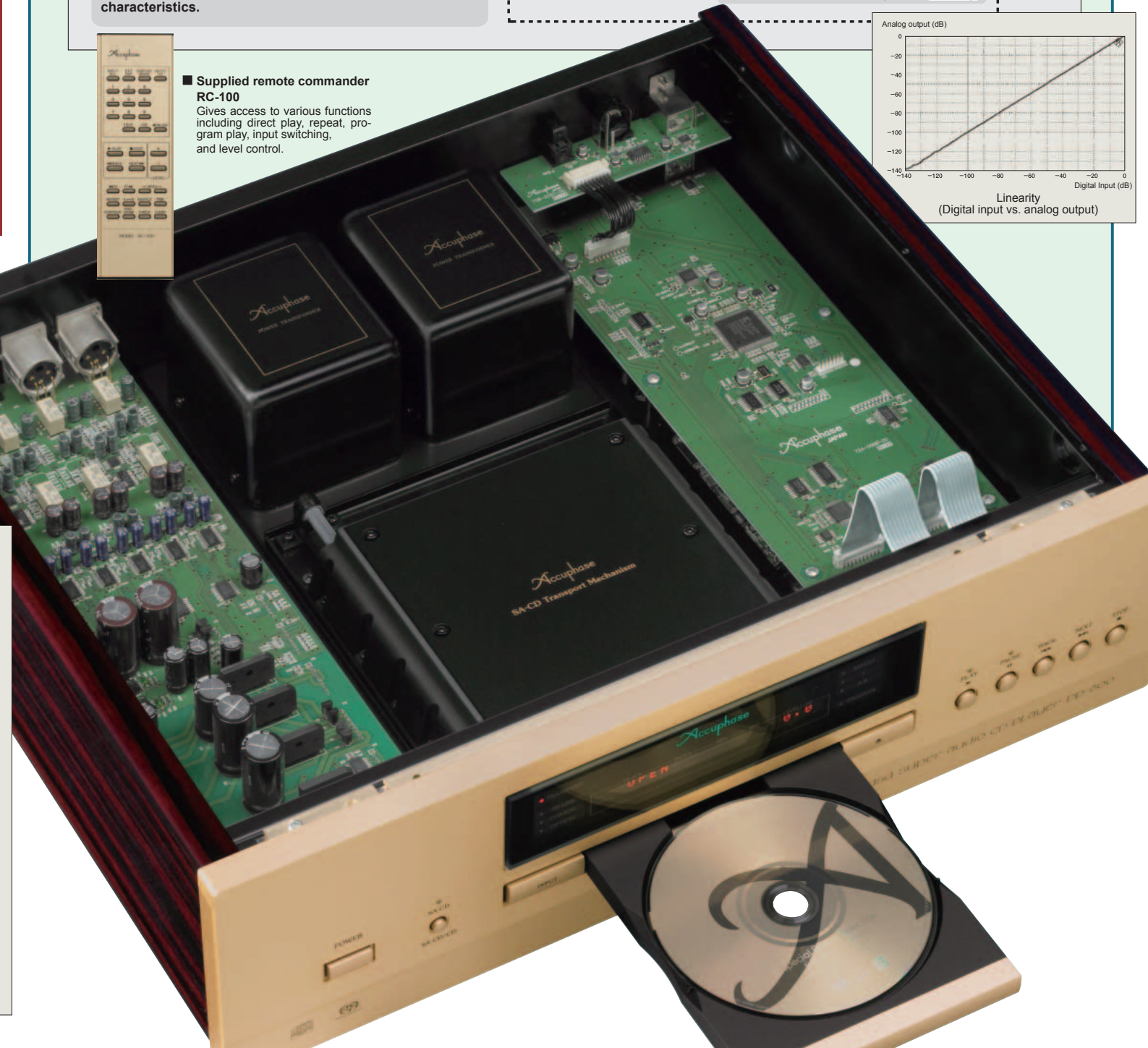
The DSD signal from the input is upsampled by a factor of 2, resulting in a sampling frequency of 5.6448 MHz/1-bit.

After volume processing, the circuit performs D/A conversion using a highly ingenious moving-average filter principle. In the DP-600, this involves five delay devices and six MDS++ type D/A converters. The signal is delayed (shifted) progressively by one clock cycle to produce six signals which are sent to separate D/A converters for direct D/A conversion. The converted signals are then summed.

Since conversion errors are kept to an absolute minimum by the use of MDS++ type DACs, the MDSD principle results in a 6-pole high-cut filter with perfectly linear phase characteristics.



- Supplied remote commander RC-100  
Gives access to various functions including direct play, repeat, program play, input switching, and level control.

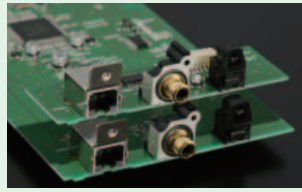


## Features and Functions of Digital Processor Section

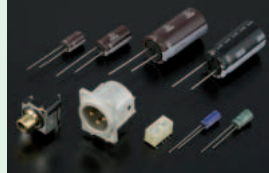
- MDS (Multiple Double Speed DSD) implements innovative digital signal processing.
- MDS++ D/A converter with six DACs driven in parallel
- Digital level control allows adjustment down to -80 dB.
- Separate transport and processor sections, with digital input and output connectors for HS-Link, coaxial, and optical connections.
- Power-on play feature allows automatic playback.
- Balanced and unbalanced analog outputs (1 set each)
- Side panels with elegant persimmons wood finish
- "High Carbon" cast iron insulator feet with superior damping characteristics further enhance sound quality



Delta-sigma type D/A converter

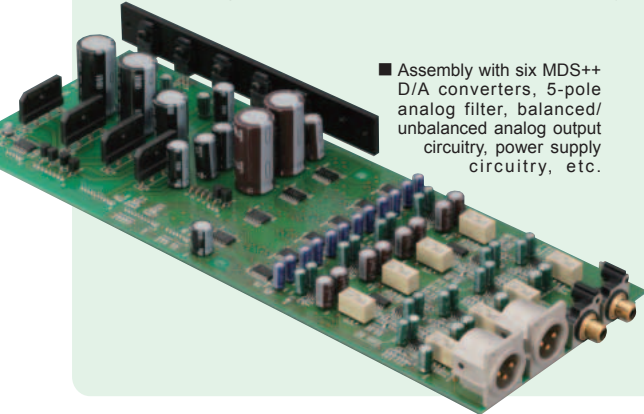


Transport outputs/digital inputs assembly



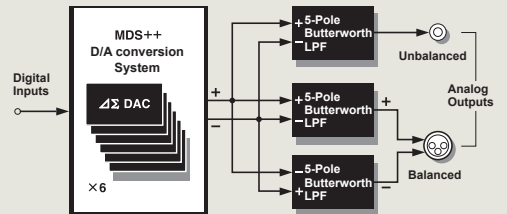
High-quality parts

- Assembly with six MDS++ D/A converters, 5-pole analog filter, balanced/unbalanced analog output circuitry, power supply circuitry, etc.

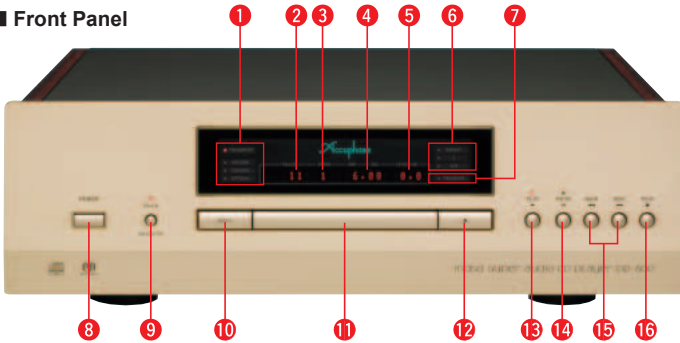


## Direct Balanced Filter With Separate Balanced/Unbalanced Circuitry

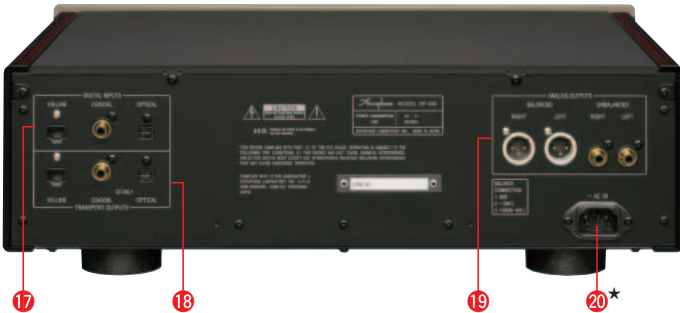
The output of any D/A converter contains so-called aliasing noise in the very high frequency range. During CD playback, an analog filter designed to remove that noise is therefore always required. The filter circuitry in the DP-600 uses 5-pole Butterworth analog filters with extremely flat frequency response in the passband. In order to prevent unwanted interaction, completely separate filters are provided for the balanced and unbalanced signal paths. A direct connection from the balancing circuit at the output of the D/A converter to the filter circuitry and symmetrical +/- configuration ensures that the +/- output impedance is also identical. This provides ideal transmission conditions for the high-quality MDS++ output.



### Front Panel



### Rear Panel



- Input indicator: TRANSPORT/HS-LINK/COAXIAL/OPTICAL
- Track number indicator
- Index indicator
- Time indicator
- Output level indicator
- Repeat indicator
- Program indicator
- Power switch
- SA-CD/CD selector button
- Input selector button
- Disc tray
- ▲ Disc tray open/close button
- ▶ Play button
- ⏸ Pause button
- ⏮⏭ BACK, NEXT track search buttons
- STOP button
- Digital inputs (HS-LINK, COAXIAL, OPTICAL)
- Transport outputs (HS-LINK, COAXIAL, OPTICAL)
- Analog outputs
  - Balanced output connectors
    - ① Ground ② Inverted (-) ③ Non-inverted (+)
  - Unbalanced output connectors
- AC power connector\*

#### Supplied accessories:

- AC power cord
- Audio cable with plugs (1 meter)
- Remote Commander RC-100
- Cleaning cloth

#### Remarks

- ★ This product is available in versions for 120/230 V AC. Make sure that the voltage shown on the rear panel matches the AC line voltage in your area.
- ★ The shape of the AC inlet and plug of the supplied power cord depends on the voltage rating and destination country.

## DP-600 Guaranteed Specifications

\* Guaranteed specifications are measured according to the JEITA standard CP-2402A.  
\* Measurement disc: PHILIPS 3122-783-00632

### Transport section

- **Compatible disc formats** 2-channel Super Audio CD  
CD
- **Data read principle** Non-contact optical pickup
- **Laser diode wavelength** SA-CD: 650 nm  
CD: 780 nm
- **Transport section outputs**
  - HS-LINK Connector type: RJ-45  
Suitable cable: Dedicated HS-Link cable
  - COAXIAL Format: IEC 60958 compliant
  - OPTICAL Format: JEITA CP-1212 compliant

### Digital processor section

- **Digital inputs**
  - HS-LINK Connector type: RJ-45  
Suitable cable: Dedicated HS-Link cable
  - COAXIAL Format: IEC 60958 compliant
  - OPTICAL Format: JEITA CP-1212 compliant
- **Sampling frequency** 32 kHz, 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz  
(16 to 24 bits, 2-channel PCM)  
Only via HS-Link 176.4 kHz, 192 kHz (24 bits, 2-channel PCM)  
2.8224 MHz (1 bit, 2-channel DSD)
- **D/A converter** MDS principle (DSD signal)  
MDS++ principle (PCM signal)
- **Frequency response** 0.7 - 50,000 Hz +0, -3.0 dB
- **Total harmonic distortion + noise** 0.0008% (20 to 20,000 Hz)
- **Signal-to-noise ratio** 114 dB
- **Dynamic range** 110 dB (24-bit input, low-pass filter off)
- **Channel separation** 108 dB (20 to 20,000 Hz)
- **Output voltage and impedance** BALANCED: 2.5 V 50 ohms, balanced XLR type  
UNBALANCED: 2.5 V 50 ohms, RCA phono jacks
- **Output level control** 0.0 dB to -80.0 dB (digital)

### General

- **Power requirements** AC120 V/230 V (Voltage as indicated on rear panel)  
50/60 Hz
- **Power consumption** 30 W
- **Max. dimensions** Width 465 mm (18-5/16")  
Height 150 mm (5-7/8")  
Depth 393 mm (15-1/2")
- **Mass** 18.5 kg (40.8 lbs) net  
25.0 kg (55.1 lbs) in shipping carton
- **Supplied Remote Commander RC-100**  
Remote control principle: Infrared pulse  
Power supply: Two IEC R03 (size AAA) batteries  
Max. dimensions: 56 mm x 175 mm x 26 mm  
Mass: 155 g (including batteries)

Accuphase

ACCUPHASE LABORATORY, INC.