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DESIGN BRIEF

PRE60 reference pre-amplifier, 4 pages



Introduction

The PRE60 is a reference audiophile dual-mono pre-amplifier designed to complement all high-end power amplifiers but chiefly as a companion to its matching A60 UFPD power amp. With these new components Primare reclaims its presence in the high-end music system market, reprising the iconic designs of previous decades with ravishing new separates, complete with state-of-the-art audio streaming performance and striking two-tone bodywork. By combining our traditional build quality and analogue circuit design with the finest digital processing, the first 60 series music system represents a major step-up from the 30 series and introduces a new supremely audiophile level of performance to Primare's product range.

The PRE60 features the comprehensive OLED display and control parameters established by the EISA award-winning I32 integrated amplifier. It is housed in a heavy gauge alloy steel chassis (15mm front panel), and incorporates two pairs (L/R) of low-noise balanced XLR inputs and 4 pairs of RCA inputs. In addition there are two pairs of RCA outputs and 2 pairs balanced XLR outputs, as well as a record output, RS232, trigger, IR and RF inputs.

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The PRE60's integrated DAC/media board offers MEDIA/streaming connections such as USB, iPod, LAN etc. It provides up to 24 bit/192 kHz streaming of files from Internet, NAS or PCs, as well as Internet radio content and also a digital audio input from a range of devices including CD players, smart phones, personal players, sat boxes etc.

Audiophile Topology

All signal paths are fully balanced and as short as possible. All signal treatments (source selection, volume and channel balance trims) are performed purely in the analogue domain. Unbalanced inputs are converted to balanced signals by a conversion stage buffered by the excellent sounding Burr Brown OPA2134 op-amps and fed to volume and balance controls employing closely matched NJW1195 attenuators in a balanced configuration. Source selection is via high performance signal relays.

Balanced signal transmission means that two identical signal lines are used to carry the same signal with opposite phase. Any noise is common to both lines is present in equal amounts and with identical phase. At the receiving end a (differential) receiver retains the opposite phase signals (music) and rejects the common phase ones (noise), leaving only the pure original signal. Balanced circuits therefore keep the signal as free as possible from interference.

The four (L/R balanced) single-ended 16dB gain stage modules are fully separated. Each has its own proprietary PCB. The gain module layout is fully integrated with the PRE60's main PCB and incorporates ultra-short signal paths and only the finest discrete components such as MOSFET transistors, MELF resistors and polypropylene capacitors. Active, well-balanced current sources are used instead of passive resistor networks.

The fully-balanced DAC section uses the flagship Crystal DSD DAC CS4398 (same as DAC30). It features an improved output buffer employing a discrete FET output device. To ensure the cleanest signal transfer, a gold pin connection from the media board to analogue pre amplifier stage is used.

The PRE60 is DC coupled from input to output. There are no capacitors in the signal path. Instead, active DC servos are used to compensate for any DC present, ensuring that the outputs are always free from DC components.

All the front panel control components are kept well separated from the analogue part of the PRE60 by the front panel's intuitive design: the electronics are placed between the front panel and the main steel chassis.

Clean power with ultra-low-power standby

The PRE60 uses a very high quality, ultra-quiet C-core transformer, custom-made for the role. Discrete analogue and digital power supplies are kept well separated. For the analogue side, a discrete ultra-fast voltage regulation circuit using discrete power transistors is deployed. The power supply capacitor bank is very large (43.000uF) and for lower ESR and best performance, is divided between many smaller capacitors. These measures have produced excellent THD+N and S/N ratio figures for the PRE60.

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The PRE60 incorporates a very low eco mode for standby. Power consumption is just 0.2W. In order to minimise high frequency components originating from the standby (high performance switch-mode) power supply when the PRE60 is in operation, the standby supply is switched off when the PRE60 is powered up, and a linear power supply comprising high quality discrete components and the C-core mains transformer takes over.

Easy User Interface

An easy set-up menu is available via the PRE60's graphical display, which is dimmable in four steps. The display auto-dims after a few seconds and returns to programmed brightness at the touch of a control. Set-up includes power-up volume, input re-naming (up to 6 characters), input disabling and trim function (volume and balance) in steps of 1dB, as well as a surround processor bypass feature.

Made in Sweden

Product features PRE60

- Custom made C-core transformer for very quiet power supply
- Power supply capacitor bank is very large (43000uF)
- Separate power supply for the analogue pre-amplifier stage and the media board
- Four-layer board for very short signal paths and optimum grounding
- Excellent 1% MELF resistors
- Unbalanced input signal will be transformed to balanced
- Discrete regulated power supply for the analogue stage
- Selectable 6dB internal gain for High gain inputs
- 2 pair XLR output (Neutrik)
- 2 pair RCA output (Nextgen)
- Switch mode power supply for ECO standby
- Heavy duty chasses with 15mm front panel

Media board

- Fully balanced DAC section using the Crystal DSD DAC (same as DAC30)
- Improved Output buffer with FET output device (discrete)
- Gold pin connection from media board to analogue pre-amplifier stage

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Product specification PRE60

Analogue Inputs	2 pair XLR (L & R) 4 pair RCA (L & R)
Other In/outputs	RS232, IR in/out, Trigger in/out, RF.
Input Impedance	15k Both RCA and XLR
Analogue Record Output	1 pair RCA (L & R)
Pre Output	2 pair RCA (L & R), 2 pair XLR (L & R)
Output Impedance	110 ohms
Frequency Response	20Hz – 100kHz -3dB
THD + N	< 0.003%, 20Hz – 100kHz, 0dB gain.
Signal to Noise	-115 dBV
Max in /out level	10Vrms
Gain	16dB
Power Consumption	Standby: 0.5W; Operate: max 38W
Dimensions (WxDxH)	430 x 385 x 142mm

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