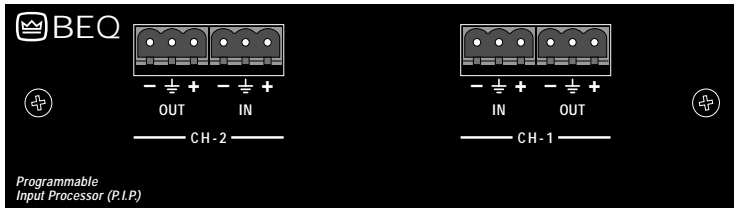


P.I.P.-BEQ

REFERENCE MANUAL



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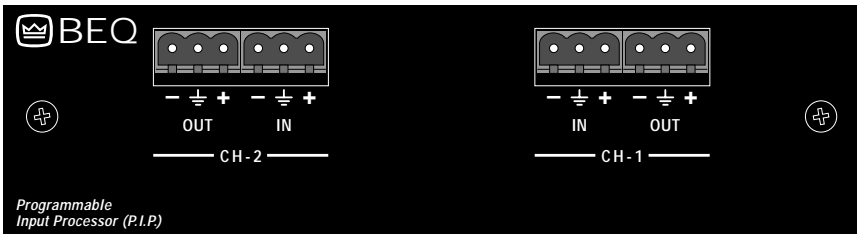


Fig. 1.1 P.I.P.-BEQ with Barrier Block Connectors

1 Welcome

Thank you for purchasing the Crown *P.I.P.-BEQ* accessory. *P.I.P.*® modules are designed to install quickly into the rear panel of many Crown amplifiers. *P.I.P.* stands for 'Programmable Input Processor.' Their versatile features expand the capabilities of your amplifier and enable you to customize it for your particular needs.

The *P.I.P.-BEQ* adds many features of Bose® Controllers to the input of your amplifier. Each channel includes a custom equalization network for the Bose loudspeakers. Separate response curves allow the models 8, 25, 32, 802 and

502A to be operated as full-range or bi-amped systems. The equalization can be turned off if desired.

Balanced inputs and 'daisy chain' outputs use removable barrier block (shown in Figure 1.1) or XLR connectors for quick solderless connection.

Feature Summary

- ❑ Defeatable Bose loudspeaker equalization for each channel.
- ❑ Full-range or bi-amplified equalization curves provided.
- ❑ Separate ground lift jumper for both input and 'daisy chain' output.

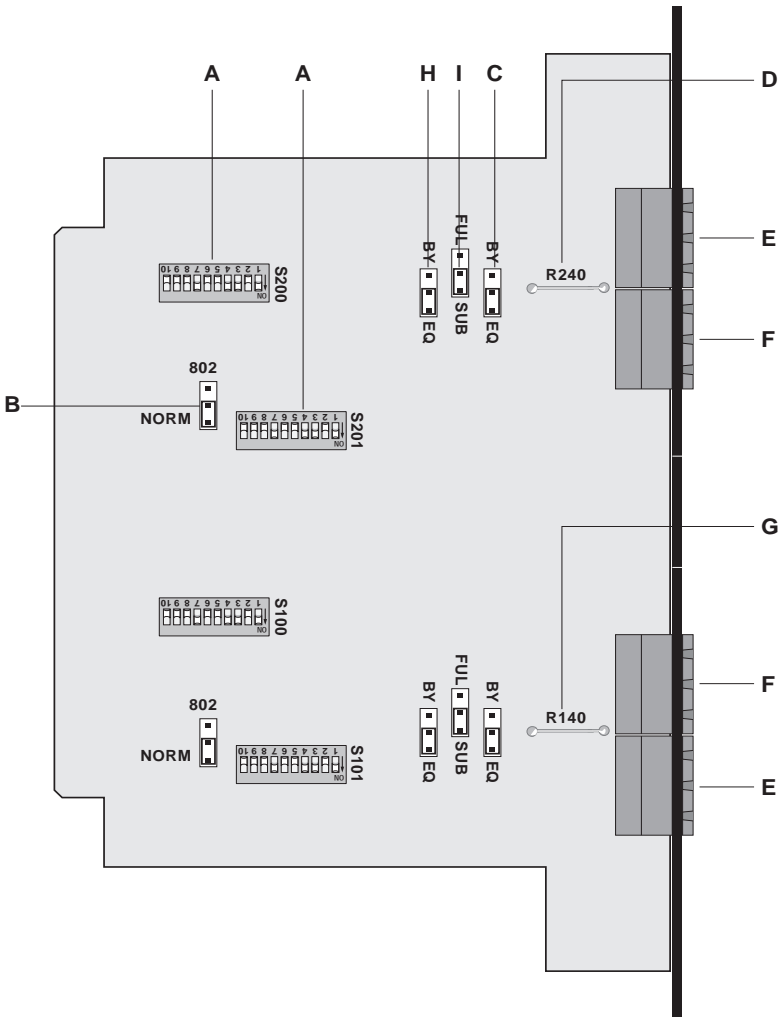


Fig. 2.1 Facilities

2 Facilities

A. DIP Switches

These DIP switches select the EQ setting for the various Bose loudspeaker models with which the *P.I.P.-BEQ* can be used.

B. Model 802 Jumper

This jumper is used with the DIP switches to select the model 802 response.

C. Daisy Chain Jumper

A jumper block is provided to control the signal that feeds the daisy chain outputs. When the jumpers are moved to EQ position, the daisy chain outputs receive the equalized signal. If the jumpers are moved toward the Bypass position, the daisy chained outputs receive the unaltered input signal.

D. Daisy Chain Ground Lift Jumper

Remove this jumper to isolate the daisy chain output ground from the chassis ground. Isolation is through an 82-ohm resistor and 0.1-microfarad capacitor.

E. Output Connector

Balanced 3-pin barrier block or XLR connectors are used for daisy chain output to other equipment.

Mating solderless plugs are included for barrier block connectors. The plugs are labelled for correct wiring.

F. Input Connector

Balanced 3-pin barrier block or XLR connectors are used for input to each channel. Mating solderless plugs are also provided for barrier block connectors. The plugs are labelled for correct wiring.

G. Input Ground Lift Jumper

Remove this jumper to isolate the input ground from the chassis ground. Isolation is provided with an 82-ohm resistor and 0.1-microfarad capacitor.

H. Equalization Jumper

The Equalization Jumper enables or disables the loudspeaker equalization network for each channel. These jumpers do NOT affect the daisy chain outputs.

I. Model 502B Jumper

This jumper is moved to the "SUB" position to select the 502B (subwoofer) response curve.

Switch Bank S100

Model	Switch Number									
	1	2	3	4	5	6	7	8	9	10
25 & 32 Full Range	ON	Off	Off	ON	ON	ON	Off	Off	ON	ON
25 & 32 Bi-Amplified	ON	Off	Off	Off	ON	ON	Off	Off	ON	ON
8 Full Range	ON	Off	Off	ON	ON	ON	Off	ON	ON	Off
8 Bi-Amplified	ON	Off	Off	Off	ON	ON	Off	ON	ON	Off
402 Full Range	Off	Off	Off	ON	ON	ON	ON	ON	ON	Off
402 Bi-Amplified	Off	Off	Off	Off	Off	Off	ON	ON	ON	Off
502A Full Range	ON	Off	Off	ON	ON	ON	Off	Off	Off	Off
502A Bi-Amplified	ON	Off	Off	Off	ON	ON	Off	Off	Off	Off
802 Full Range	Off	Off	ON	Off	ON	Off	ON	Off	ON	ON
802 Bi-Amplified	Off	Off	Off	Off	Off	ON	ON	Off	ON	ON
502B	X	X	X	X	X	X	X	X	X	X

X = switch position is unimportant

Switch Bank S101

Model	Switch Number									
	1	2	3	4	5	6	7	8	9	10
25 & 32 Full Range	ON	Off	Off	Off	X	Off	Off	Off	ON	Off
25 & 32 Bi-Amplified	ON	Off	ON	Off	X	Off	Off	Off	Off	Off
8 Full Range	ON	Off	Off	Off	X	Off	Off	Off	ON	ON
8 Bi-Amplified	ON	Off	ON	Off	X	Off	Off	ON	Off	ON
402 Full Range	ON	ON	ON	ON	X	ON	Off	ON	Off	Off
402 Bi-Amplified	ON	ON	ON	Off	X	ON	Off	Off	Off	Off
502A Full Range	Off	Off	Off	Off	X	Off	Off	Off	ON	Off
502A Bi-Amplified	Off	Off	Off	Off	X	Off	Off	Off	ON	Off
802 Full Range	ON	ON	Off	Off	X	ON	ON	Off	ON	Off
802 Bi-Amplified	ON	ON	ON	Off	X	ON	ON	Off	Off	Off
502B	X	X	X	X	X	X	X	X	X	X

X = switch position is unimportant

Table 1—S100 and S101 Switch Positions vs Model

Model	Z100	Z103
32 Full Range	FUL	N
32 Bi-Amplified	FUL	N
8 Full Range	FUL	N
8 Bi-Amplified	FUL	N
402 Full Range	FUL	N
402 Bi-Amplified	FUL	N
502A Full Range	FUL	N
502A Bi-Amplified	FUL	N
802 Full Range	FUL	802
802 Bi-Amplified	FUL	802
502B	SUB	X

X = switch position is unimportant

Table 2—802 Response Jumper Positions vs Model

3 Installation

The internal jumpers and switches of the P.I.P.-BEQ must be set prior to installation. See the previous section for a description of each jumper.

The graphs in Figures 3.1 through 3.11 show the typical frequency response for all valid switch combinations.

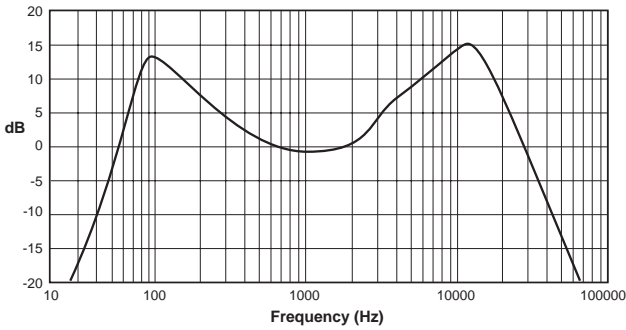


Fig. 3.1 Equalization Response for Model 25, 32, Full Range

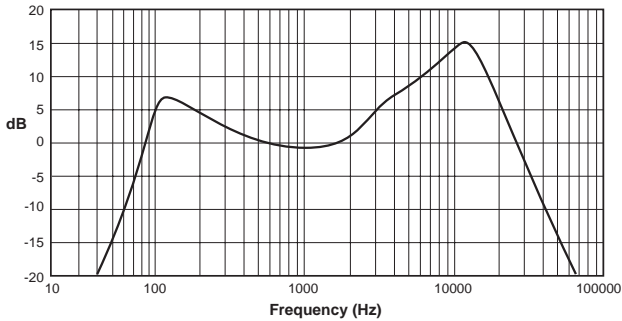


Fig. 3.2 Equalization Response for Model 25, 32, Bi-Amplified

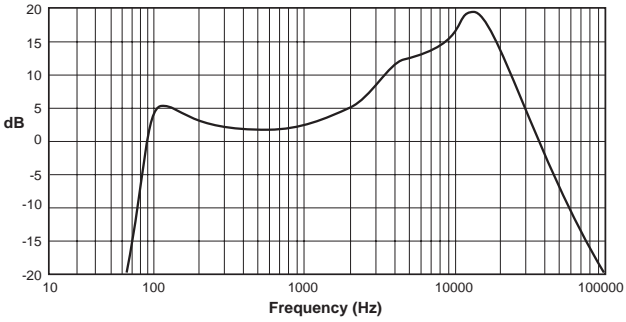


Fig. 3.3 Equalization Response for Model 502A, Full Range

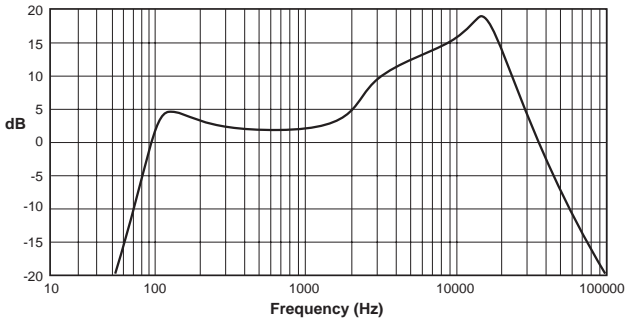


Fig. 3.4 Equalization Response for Model 502A, Bi-Amplified

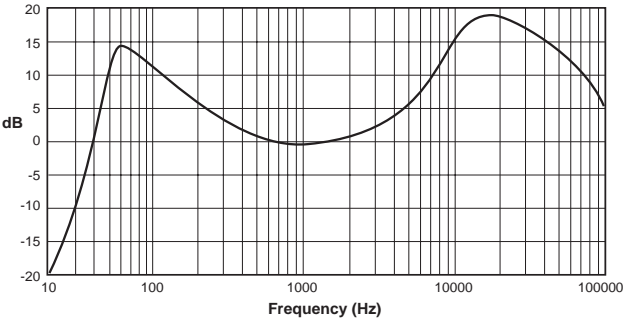


Fig. 3.5 Equalization Response for Model 802, Full Range

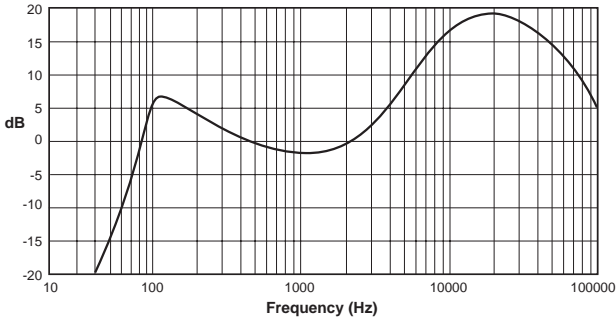


Fig. 3.6 Equalization Response for Model 802, Bi-Amplified

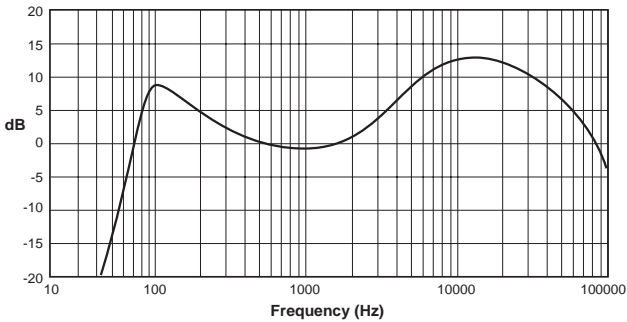


Fig. 3.7 Equalization Response for Model 402, Full Range

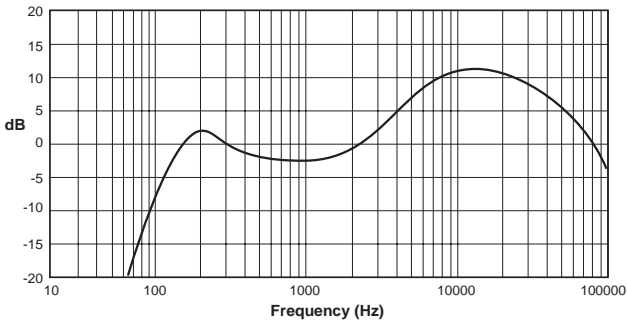


Fig. 3.8 Equalization Response for Model 402, Bi-Amplified

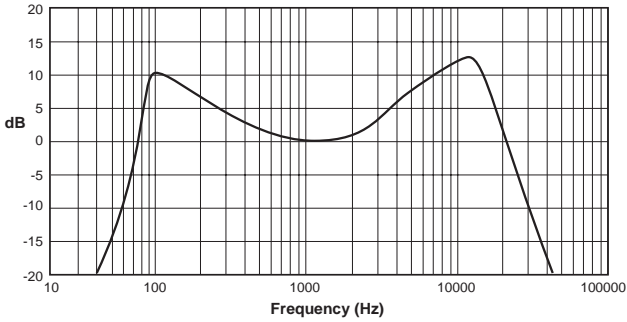


Fig. 3.9 Equalization Response for Model 8, Full Range

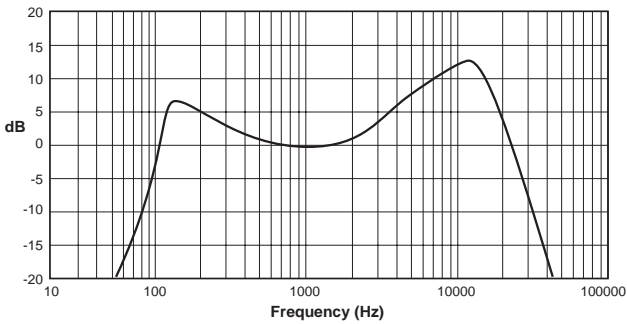


Fig. 3.10 Equalization Response for Model 8, Bi-Amplified

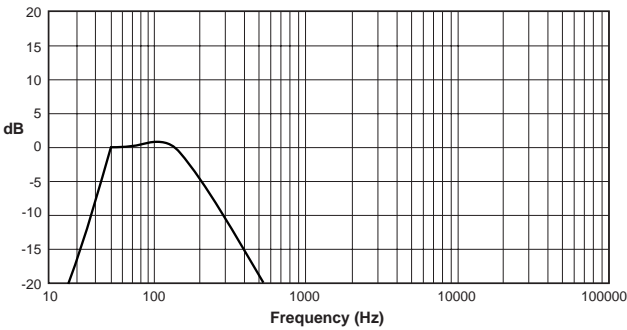


Fig. 3.11 Equalization Response for Model 502B

3.1 Biamping

Those who are not familiar with Bose products may need to understand that Bose handles the biamping of its loudspeaker products in a different manner than the traditional industry practice. Standard industry practice is to split the audio bandwidth into two discrete sections divided by 2nd-order (12-dB/octave) or steeper filters (see Figure 3.12).

The way Bose uses the biamp designation does not limit the bandwidth passing to the upper (high pass) section; however, it does lower the level of bass equalization employed (see Figures 3.13 and 3.14). The additional bass energy required is then derived from the 502B subwoofer (see Figures 3.25 and 3.16).

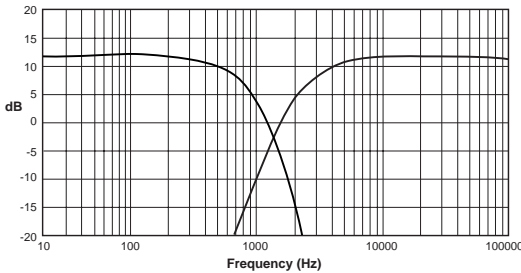


Fig. 3.12 Traditional Industry Practice for Biamping

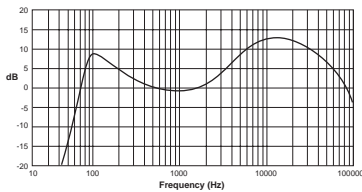


Fig. 3.13 Typical Bose Full-Range Response

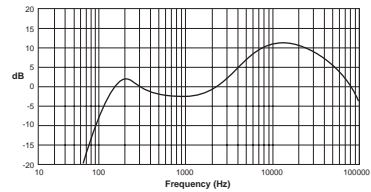


Fig. 3.14 Typical Bose Biampified Response

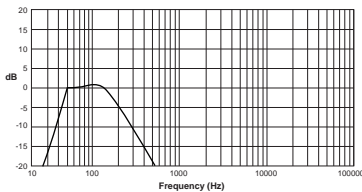


Fig. 3.15 Bose 502B Subwoofer Response

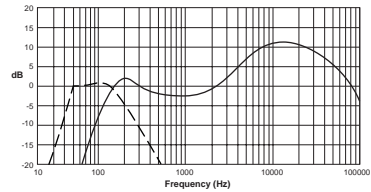


Fig. 3.16 Typical Bose Response Using 502B for Bass Supplement

3.2 Installation Procedures

You may need a phillips screwdriver to remove the existing *P.I.P.* module or panel from your amplifier.

CAUTION: Before connecting this or any *P.I.P.* to your amplifier, it is important to turn its level controls down, turn it off and remove the AC power. Don't touch the circuitry. Even though the amplifier is off, there could still be enough energy remaining to cause electric shock.

1. Turn down the level controls (full counterclockwise), turn off the amplifier and unplug it from the AC power source.
2. Remove the existing *P.I.P.* module or panel (two screws). For *PIP2* amplifiers, this may involve disconnecting the *P.I.P.* from a *PIP2* input adaptor (see Figures 3.18 and 3.19). If a *PIP2* input adaptor is already present, do not remove the ribbon cables from the adaptor. Otherwise you will have to reconnect them in the next step.
3. *Standard P.I.P. Amplifiers:* Align the edges of the *P.I.P.-BEQ* in the *P.I.P.* card rails and firmly push

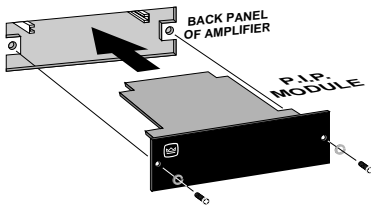


Fig. 3.17 Installation into a Standard *P.I.P.* Amplifier

the unit in until it is seated against the mounting bracket (see Figure 3.17).

PIP2 Amplifiers: (Requires a *PIP2* input adaptor. Crown part number Q43528-1.) Connect the *PIP2* input adaptor to the two input cables of the amplifier (see Figure 3.18). Notice that the *PIP2* input adaptor should be positioned with the *P.I.P.* edge connector on top and facing away from the amplifier. The 20 pin cable (A) is connected first then the 18 pin cable (B) is connected. Both ribbon cables should extend below the *PIP2* input adaptor.

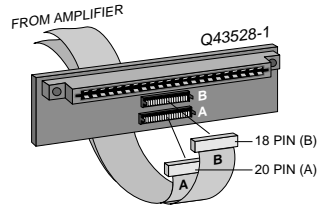


Fig. 3.18 *PIP2* Input Adapter Connection

Next, insert the edge connector of the *P.I.P.-BEQ* into the *PIP2* input adaptor (see Figure 3.19) and in-

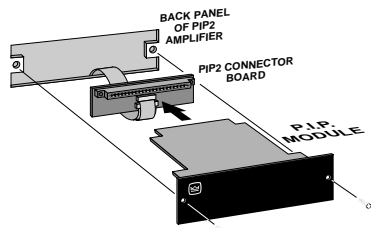


Fig. 3.19 Installation into a *PIP2* Amplifier

sert the assembly into the *P.I.P.* opening in the back of the amplifier.

4. Tighten the two *P.I.P.* mounting thumbscrews.
5. Connect input and output wiring.
6. Plug in the amplifier and turn it on. Adjust its level controls to a desired setting. (In Dual mode, the level controls can now be used to balance the low and high frequencies.)

Do not tamper with the circuitry. Circuit changes made by unauthorized personnel, or unauthorized circuit modifications are not allowed.

Remember: Crown is not liable for any damage resulting from over-

driving other components in your sound system.

Figure 3.20 shows how to wire a balanced and unbalanced source or daisy-chain output to the barrier block connectors.

Important: If the amplifier is used in either Bridged-Mono or Parallel-Mono mode, you must turn the Ch. 2 amplifier level control off (fully counterclockwise). The input and level control of Ch. 2 are not defeated in mono mode so any signal applied to Ch. 2 will beat against the signal in Ch. 1.

Refer to the amplifier *Reference Manual* for more information about Bridged-Mono or Parallel-Mono modes of operation.

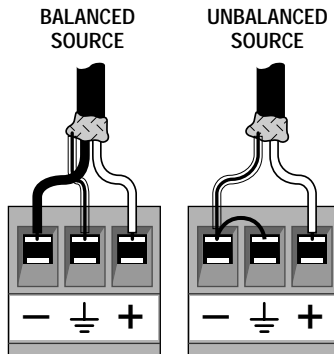


Fig. 3.20 Audio Wiring

4 Specifications

Note: All specifications are referenced to a 0.775-V input signal.

Signal to Noise: Greater than 90 dB from 20 Hz to 20 kHz in Bypass mode. Greater than 85 dB in EQ mode.

Frequency Response: ± 0.1 dB from 20 Hz to 20 kHz in Bypass mode. ± 2 dB from the response curves in Figure 3.1 through 3.6 in EQ mode.

Harmonic Distortion (THD): Less than 0.05% THD from 20 Hz to 20 kHz in Bypass mode with a 0 dBu input signal. Less than 0.1% THD from 20 Hz to 20 kHz in EQ mode at 0 dBu.

Common Mode Rejection: Better than 60 dB up to 1 kHz.

Crosstalk: Less than -60 dB from 20 Hz to 20 kHz.

Notes:

1. All resistor values are in ohms, $\frac{1}{4}$ W, 5% unless otherwise specified.
2. All capacitor values are in microfarads unless otherwise specified.
3. P1 pins 6, 8, 9, 10, 12-22 are not used.

Connectors: Solderless barrier block or XLR connectors (depending on model) for both input and daisy chain output.

Input Impedance: Nominally 50 kohms balanced; 25 kohms unbalanced.

Maximum Input Level: +20 dB.

Output Impedance: (daisy chain output) Nominally 75 ohms balanced.

Maximum Output Level: (daisy chain output) +20 dB into a 600-ohm load.

Nominal Gain: -6 dBV at 1 kHz

Dimensions: $6\frac{3}{8}$ x $1\frac{1}{8}$ x $3\frac{3}{8}$ in. (16.2 x 4.8 x 9.8 cm).

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