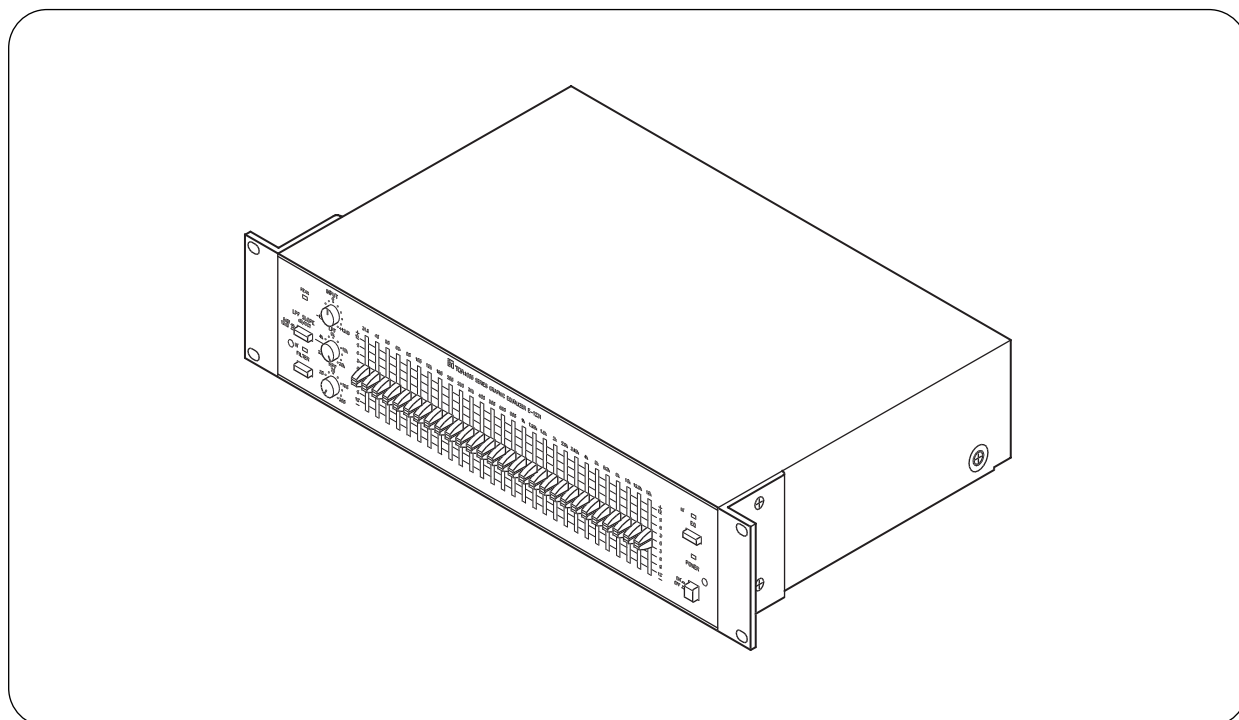


GRAPHIC EQUALIZER
E-1231

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Thank you for purchasing TOA's Graphic Equalizer.
Please carefully follow the instructions in this manual to ensure long, trouble-free use of your equipment.

1. IMPORTANT SAFETY INSTRUCTIONS

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

2. SAFETY PRECAUTIONS

- Before installation or use, be sure to carefully read all the instructions in this section for correct and safe operation.
- Be sure to follow all the precautionary instructions in this section, which contain important warnings and/or cautions regarding safety.
- After reading, keep this manual handy for future reference.

Safety Symbol and Message Conventions

Safety symbols and messages described below are used in this manual to prevent bodily injury and property damage which could result from mishandling. Before operating your product, read this manual first and understand the safety symbols and messages so you are thoroughly aware of the potential safety hazards.

 **WARNING**

Indicates a potentially hazardous situation which, if mishandled, could result in death or serious personal injury.

 **CAUTION**

Indicates a potentially hazardous situation which, if mishandled, could result in moderate or minor personal injury, and/or property damage.

 **WARNING**

When Installing the Unit

- Do not expose the unit to rain or an environment

where it may be splashed by water or other liquids, as doing so may result in fire or electric shock.

- Use the unit only with the voltage specified on the unit. Using a voltage higher than that which is specified may result in fire or electric shock.

- Do not cut, kink, otherwise damage nor modify the power supply cord. In addition, avoid using the power cord in close proximity to heaters, and never place heavy objects -- including the unit itself -- on the power cord, as doing so may result in fire or electric shock.
- Since the unit is designed for in-door use, do not install it outdoors. When it gets wet with rain, there is a danger of electric shock.
- The apparatus shall be connected to a mains socket outlet with a protective earthing connection.
- The socket-outlet shall be installed near the equipment and the plug shall be easily accessible.
- When moving the unit, be sure to remove its power supply cord from the wall outlet. Moving the unit with the power cord connected to the outlet may cause damage to the power cord, resulting in fire or electric shock. When removing the power cord, be sure to hold its plug to pull.
- Avoid installing the unit in humid or dusty locations, in locations exposed to the direct sunlight, near the heaters, or in locations generating sooty smoke or steam as doing otherwise may result in fire or electric shock.
- Be sure to follow the instructions below when rack-mounting the unit. Failure to do so may cause a fire or personal injury.

When the Unit is in Use

- Should the following irregularity be found during use, immediately turn off this unit's power switch, disconnect the power supply plug from the AC outlet and contact your nearest TOA dealer. Make no further attempt to operate the unit in this condition as this may cause fire or electric shock.
 - If you detect smoke or a strange smell coming from the unit.
 - If water or any metallic object gets into the unit
 - If the unit falls, or the unit case breaks
 - If the power supply cord is damaged (exposure of the core, disconnection, etc.)
 - If it is malfunctioning (no tone sounds.)
- To prevent a fire or electric shock, never open nor remove the unit case as there are high voltage components inside the unit. Refer all servicing to qualified service personnel.
- Do not place cups, bowls, or other containers of liquid or metallic objects on top of the unit. If they accidentally spill into the unit, this may cause a fire or electric shock.
- Do not insert nor drop metallic objects or flammable materials in the ventilation slots of the unit's cover, as this may result in fire or electric shock.
- When replacing the fuse, be sure to use the supplied one. Using any other fuse than supplied may cause fire or electric shock.
- Install the equipment rack on a stable, hard floor. Fix it with anchor bolts or take other arrangements to prevent it from falling down.
- When connecting the unit's power cord to an AC outlet, use the AC outlet with current capacity allowable to the unit.
- The supplied rack-mounting screws can be used for the TOA equipment rack only. Do not use them for other racks.
- When installing the unit in a rack other than that of TOA, be sure to use the screws with a diameter of over 5 mm and length of over 20 mm to mount the unit. Failure to do so may cause personal injury.

When the Unit is in Use

- If dust accumulates on the power supply plug or in the wall AC outlet, a fire may result. Clean it periodically. In addition, insert the plug in the wall outlet securely.
- Switch off the power, and unplug the power supply plug from the AC outlet for safety purposes when cleaning or leaving the unit unused for 10 days or more. Doing otherwise may cause a fire or electric shock.

 **CAUTION**

When Installing the Unit

- Never plug in nor remove the power supply plug with wet hands, as doing so may cause electric shock.
- When unplugging the power supply cord, be sure to grasp the power supply plug; never pull on the cord itself. Operating the unit with a damaged power supply cord may cause a fire or electric shock.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operation and maintenance (servicing) instruction in the literature accompanying the appliance.

3. GENERAL DESCRIPTION

The E-1231 is a single channel, 1/3 octave active graphic equalizer designed to allow clean, accurate audio equalization for stage, studio, or commercial applications.

The E-1231 provides 12 dB of boost or cut at each of its 28 frequencies, which are centered at ISO 1/3 octave increments from 31.5 Hz to 16 kHz.

The E-1231's active bandpass/bandreject filters are designed for minimum phase shift, and feature smooth slide controls with center detents for easy and accurate adjustment. (The filters are summed in parallel for reliability, so that the failure of one filter does not interrupt operation of the others.)

In addition, continuously variable highpass filters are provided on the front panel. The highpass filter has a slope of 12 dB per octave and is variable from 15 Hz to 300 Hz, while the lowpass filter can set for either a 6 dB per octave slope or a 12 dB per octave slope and is variable from 2.5 kHz to 30 kHz.

An input level control on the E-1231 gives ± 12 dB of adjustment to allow a wide variety of input sources. A LED indicator illuminates when either the input or the output comes within 3 dB of clipping. In addition to the usual EQ in/out switch, an automatic EQ bypass function provides complete equalization bypass in the event of loss of AC power, and an output muting function suppresses turn-on/turn-off transients.

A security cover is included with the E-1231 to guard against accidental disturbance, or intentional tampering when used in fixed installations.

The E-1231 can be mounted in a standard 19" rack and occupies 3-1/2" of vertical space.

4. FEATURES

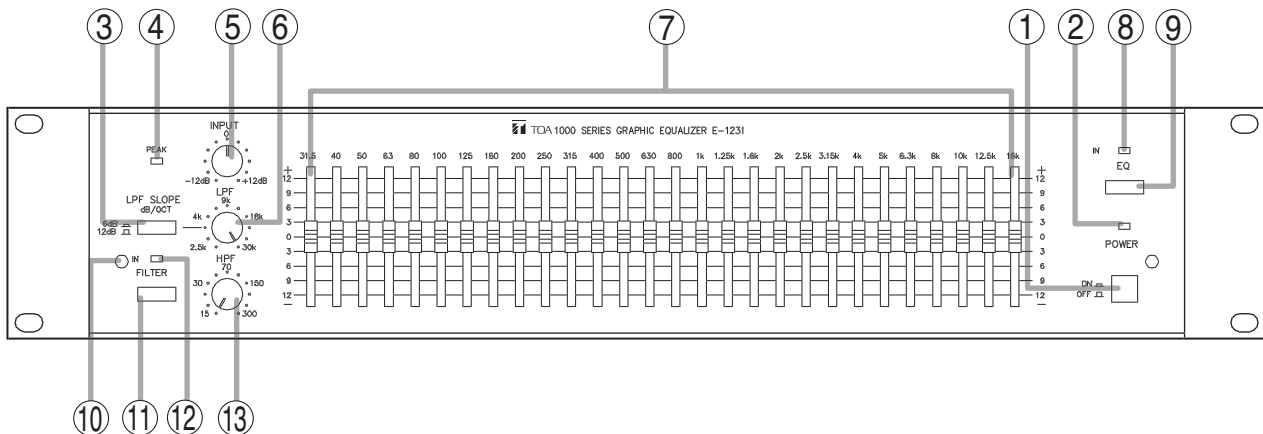
- 12 dB boost or cut at each center frequency, continuously variable.
- High quality, low phase-shift active filters.
- Precision calibrated, noiseless slide controls with center detent.
- Equalizer In/Out switch.
- Continuously variable highpass and lowpass filters.
- LED peak indicator to detect clipping at input or output levels.
- Variable input level control to accept variety of input sources.
- Automatic EQ bypass circuitry.
- A security cover is included.
- Filter In/Out switch
- Lowpass filter can be set for either 6 dB/oct or 12 dB/oct.

5. HANDLING PRECAUTIONS

- Do not operate the E-1231 from power mains which exceeds the indicated mains voltage by more than 10%.
- When cleaning the unit, be sure to turn the power switch to OFF. Wipe with a soft dry cloth. If it gets very dirty, use the soft cloth slightly moistened in neutral cleanser. Never use thinner, benzene, chemically processed towels, or alcohol as the unit's plastic or other parts may be deformed or discolored.

6. NOMENCLATURE AND FUNCTIONS

[Front]



1. Power switch

Pushbutton alternately switches the AC power on and off.

2. Power indicator LED

The green LED lights when the power switch is "ON".

3. Lowpass filter slope selection switch

This switch sets the lowpass filter's per octave attenuation for either 6 dB or 12 dB.

4. Peak indicator LED

The peak indicator LED lights when either the input or the output level reaches 3 dB below clipping.

5. Input level control

This control adjusts the input gain by ± 12 dB to allow the use of a wide range of input sources. To insure the best S/N ratio possible, adjust this control so that the peak LED flashes only occasionally.

6. Lowpass filter control

This is a shelving-type filter that provides a 12 dB or 6 dB per octave roll off above 2.5 kHz and up to 30 kHz. Its main purpose is to stop high frequency noise, oscillation, and certain types of RF interference from damaging tweeters. It is also useful in reducing excessive background noise, such as that produced by old phonograph records.

7. Equalizer sliders

These sliders are adjusted to tune or equalized the overall frequency response of a sound system.

8. Equalizer indicator LED

The indicator LED turns on whenever the equalizer IN/OUT switch is "IN".

9. Equalizer IN/OUT switch

Equalizer switch puts the input signals either in circuit or out of circuit of the equalizer. The "OUT" position provides flat audio response no matter what the positions of the equalizer sliders and the filter (LPF/HPF) control.

10. Security cover mounting hole

This hole is used to mount the supplied security cover with two screws to avoid accidental changes in set position of control knobs and switches.

11. Filter IN/OUT switch

Pressing this switch while equalizer indicator lights provides the frequency response set for by the lowpass-and highpass-filter control. Press the switch again to disable the lowpass-and highpass-filter control.

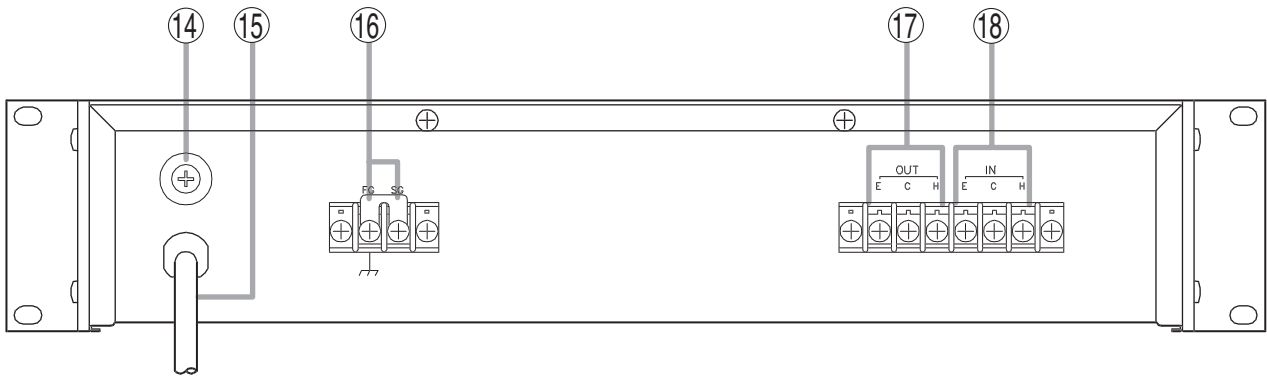
12. Filter indicator LED

The filter indicator LED lights when the filter switch is "IN".

13. Highpass filter control

This shelving-type filter provides an 12 dB per octave rolloff between 300 Hz and 15 Hz. It is especially useful for reducing stage or turntable rumble, AC hum, wind noise, and other subsonic components that waste amplifier power and tax speakers.

[Rear]



14. AC fuse holder

When replacing, be sure to use the fuse of specified rating and type to avoid the possibility of fire.

Fuse rating

E-1231 H: 250 V T80 mA

E-1231 US: 250 V T160 mAL

15. AC power cord

16. Ground screw terminal

Hum can result from a ground loop to be formed when the E-1231 is connected to other equipment. In such cases, cut the loop by removing a short piece, which should usually be mounted to the terminal.

Note

This ground is not for protective ground.

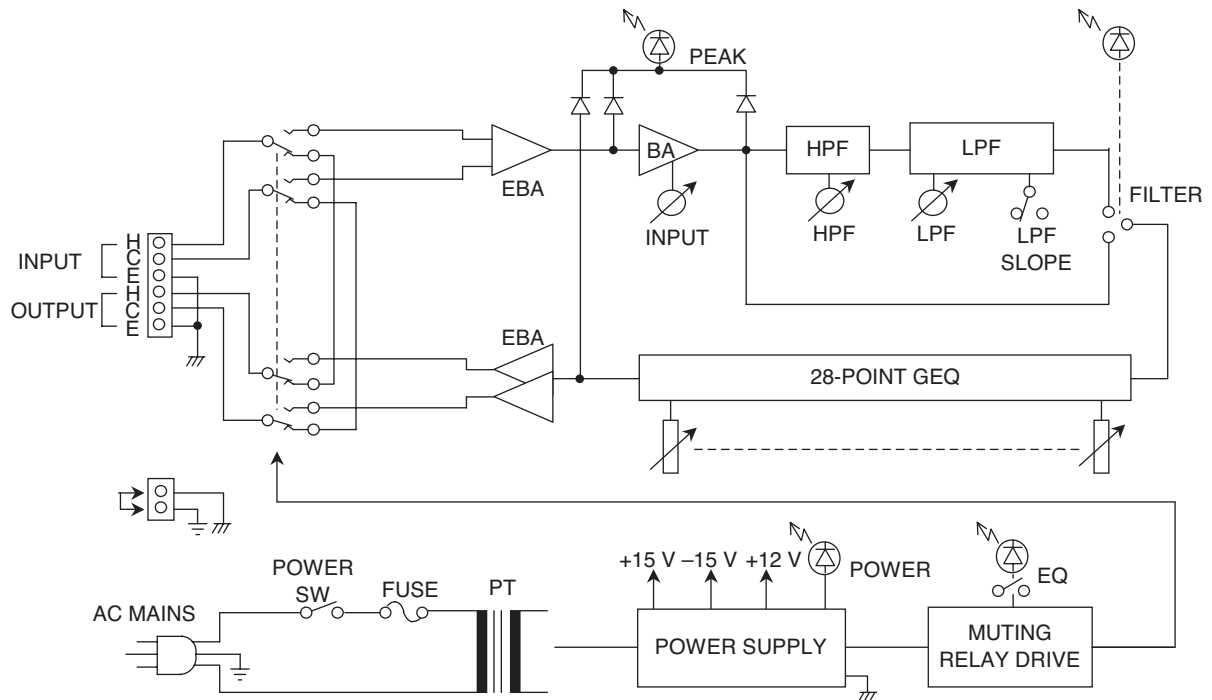
17. Output screw terminal

The output terminal is balanced and 600 ohms in output impedance. Place the supplied short piece between E and C to convert to unbalanced type.

18. Input screw terminal

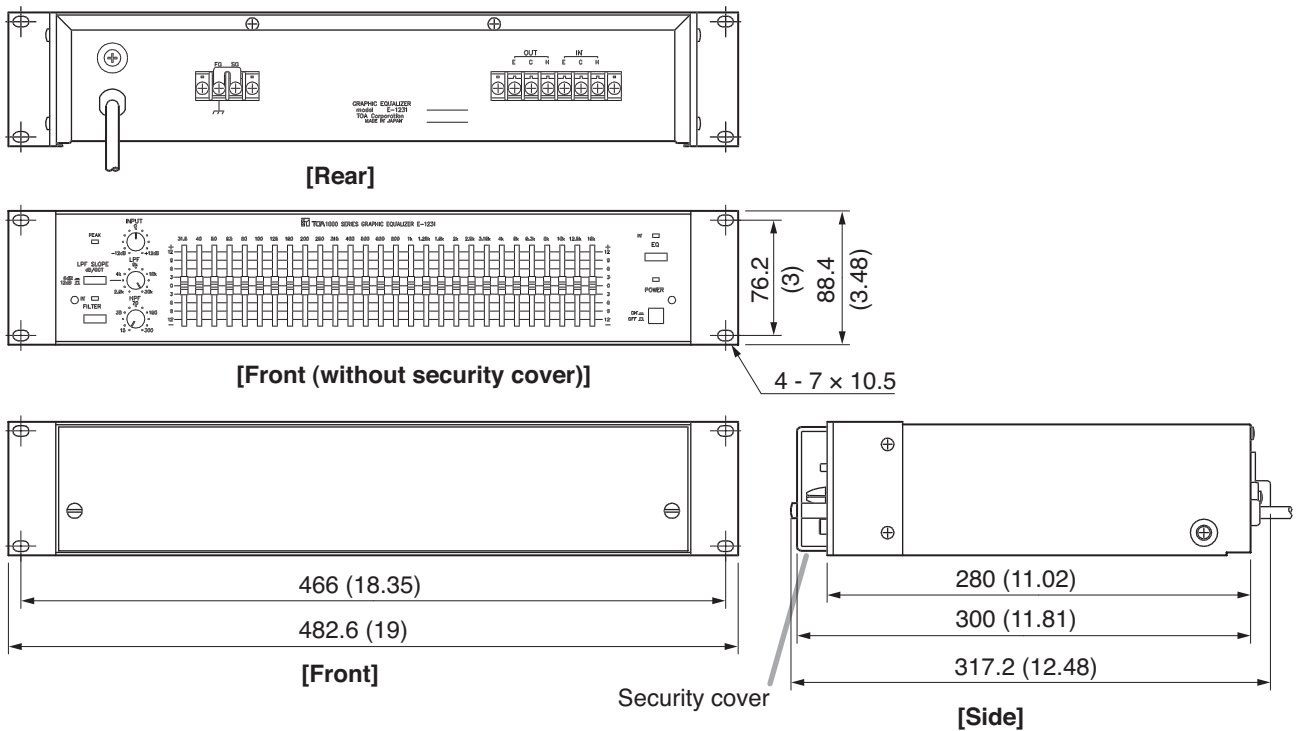
The input terminal is balanced and 10 k ohms in input impedance. Place the supplied short piece between E and C to convert to unbalanced type.

7. BLOCK DIAGRAM



8. DIMENSIONAL DIAGRAM

Unit: mm (in)



9. SPECIFICATIONS

Frequency Response	20 Hz to 20 kHz \pm 1 dB
Total Harmonic Distortion	Less than 0.01% (at 1 kHz, all sliders at 0 position, rated output)
Center Frequency	31.5 Hz, 40 Hz, 50 Hz, 63 Hz, 80 Hz, 100 Hz, 125 Hz, 160 Hz, 200 Hz, 315 Hz, 400 Hz, 500 Hz, 630 Hz, 4 kHz, 5 kHz, 6.3 kHz, 8 kHz, 10 kHz, 12.5 kHz, 16 kHz
Rated Input Level	+4 dB* (INPUT LEVEL CONTROL set for 0 position)
Rated Output Level	+4 dB*, 600 Ω load
Maximum Input Level	+20 dB* at 1 kHz
Maximum Output Level	+20 dB* with 600 Ω load
Input Impedance	10 k Ω
Output Impedance	600 Ω
Hum and Noise	-94 dB* (EQ in, all sliders at 0 position, 20 Hz – 20 kHz BPF)
Indicators	A red LED for output and input clipping A green LED for equalizer IN A green LED for power ON A green LED for filter IN
Controls	Equalizer Sliders \pm 12 dB Input Level Control \pm 12 dB Highpass Filter 12 dB per octave Adjustable Cutoff Frequency: 15 Hz to 300 Hz Lowpass Filter 12 dB per octave/6 dB per octave Adjustable Cutoff Frequency: 2.5 kHz to 30 kHz
AC Line Voltage	E-1231 H: 220 – 240 V AC, 50 Hz/60 Hz E-1231 US: 120 V AC, 60 Hz
Power Consumption	11 W
Finish	Black
Dimensions	483 (w) x 88 (h) x 317 (d) mm (19" x 3.5" x 12.5")
Weight	4.5 kg (9.92 lb)

* 0 dB = 0.775 Vrms

Note: The design and specifications are subject to change without notice for improvement.

• Accessories

Security cover	1
Screw for security cover	2
Short piece	2
Fuse	1
Rack mounting screw	4