

# Plena Easy Line Power Amplifier



Security Systems

en | Installation and User Instructions  
PLE-1P120-US  
PLE-1P240-US

**BOSCH**

## Important safeguards

### Alerts on the apparatus



This symbol found on the apparatus indicates hazards arising from dangerous voltages.



This symbol found on the apparatus indicates the user should read all safety statements found in the operating instructions.



This symbol found on the apparatus indicates double insulation.



#### Warning

To reduce the risk of fire or electrical shock, do not expose this apparatus to rain or moisture.



This symbol found on the apparatus indicates that the apparatus must be placed in a separate collection facility for electronic waste and not disposed with household waste.

- 1 Read instructions - All the safety instructions for use should be read before the system is operated.
- 2 Retain instructions - The safety instructions and operating instructions should be retained for future reference.
- 3 Heed warnings - All warnings on the unit and in the operating instructions should be adhered to.
- 4 Follow instructions - All operating instructions and instructions for use should be followed.
- 5 Cleaning - Unplug system units from the mains outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use only a dry cloth for cleaning.
- 6 Attachments - Do not use attachments not recommended by the product manufacturer as they may cause hazards.
- 7 Water and Moisture - Do not use this unit near water, for example near a bathtub, washbowl, kitchen sink, or laundry basket, in a wet basement, near a swimming pool, in an unprotected outdoor installation or any area which is classified as a wet location.
- 8 Accessories - Do not place this unit on an unstable stand, tripod, bracket or mount. This unit may fall, causing serious injury to a person and serious damage to the unit. Use only a stand, tripod, bracket or mount recommended by the manufacturer, or sold with the product. Any mounting of the unit should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.
- 9 Ventilation - Openings in the enclosure, if any, are provided for ventilation and to ensure reliable operation of the unit and to protect it from overheating. These openings must not be blocked or covered. The unit should not be placed in a built-in installation unless proper ventilation is provided or the manufacturer's instructions have been adhered to. Maintain a minimum distance of 2 inch (50 mm) around the front, the rear, and the sides of the unit for sufficient ventilation.
- 10 Heat sources - Do not install the unit near any heat sources such as radiators, stoves, or other apparatus that produce heat (including amplifiers).
- 11 Open flames - No open flames, such as lighted candles, should be placed on the unit.
- 12 Power sources - Units should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply you plan to use, consult your appliance dealer or local power company. For units intended to operate from battery power, or other sources, refer to the "Installation and User Instructions".
- 13 Grounding or polarisation - This unit may be equipped with a polarised alternating current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarised plug. Alternatively, this unit may be equipped with a 3-wire grounding type plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the

- outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type lug.
- 14 Power-Cord Protection - Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.
- 15 Overloading - Do not overload outlets and extension cords as this can result in a risk of fire or electrical shock.
- 16 Object and Liquid Entry - Never push objects of any kind into this unit through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the unit.
- 17 Servicing - Do not attempt to service this unit yourself as opening or removing covers may expose to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
- 18 Damage Requiring Service - Unplug the unit from the outlet and refer servicing to qualified service personnel under the following conditions:
- When the power-supply cord or plug is damaged.
  - If liquid has been spilled, or objects have fallen into the unit.
  - If the unit has been exposed to rain or water.
  - If the unit does not operate normally by following the instructions for use. Adjust only those controls that are covered by the instructions for use, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the units to their normal operation.
  - If the unit has been dropped or the unit has been damaged.
  - When the unit exhibits a distinct change in performance; this indicates a need for service.
- 19 Replacement Parts - When replacement parts are required be sure the service technician has used replacement parts specified by the manufacturer or parts which have the same characteristics as the original part. Unauthorised substitutions may result in fire, electric shock or other hazards.
- 20 Safety Check - Upon completion of any service or repairs to the units, ask the service technician to perform safety checks to determine that the unit is in proper operating condition.
- 21 Lightning - For added protection of the units during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the cable system. This will prevent damage to the unit due to lightning and power-line surges.
- 22 Disconnection - To completely disconnect this unit from the AC mains, disconnect the power supply cord plug from the AC receptacle. The mains plug of the power supply cord shall remain readily operable to be able to disconnect power from the unit.
- 23 Before installing or operating this product, always read the Safety Instructions, which are available as a separate document (9922 141 7014x). These instructions are supplied together with all equipment that can be connected to the mains.

**American Users****Note**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**Canadian Users****Note**

This Class B digital device complies with Canadian ICES-003.

Cet appareil numérique de classe B est conforme à la norme NMB-003 du Canada.

Thank you for choosing a Bosch Security Systems product!

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# 1 Introduction

## 1.1 Purpose

The purpose of these Installation and User Instructions is to provide information required for installing, configuring and operating a Plena Power Amplifier.

## 1.2 Digital document

These Installation and User Instructions are also available as a digital document in the Adobe Portable Document Format (PDF).

## 1.3 Intended audience

These Installation and User Instructions are intended for installers and users of a Plena system.

## 1.4 Related documentation

Safety Instructions (9922 141 1036x).

## 1.5 Alerts

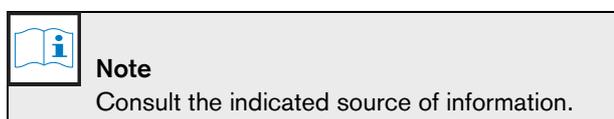
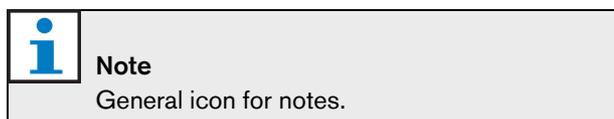
Four types of alerts are used in this manual. The alert type is closely related to the effect that may be caused if it is not observed. These alerts - from least severe effect to most severe effect - are:

- **Note**  
Alert containing additional information. Usually, not observing a note alert does not result in damage to the equipment or personal injuries.
- **Caution**  
The equipment can be damaged if the alert is not observed.
- **Warning**  
Persons can be (severely) injured, or the equipment can be seriously damaged, if the alert is not observed.
- **Danger**  
Not observing the alert can result in death.

## 1.6 Icons

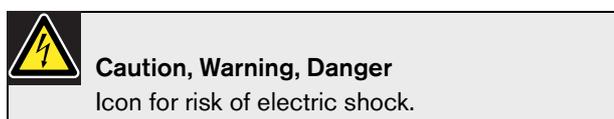
### 1.6.1 Note icons

The icons used in combination with Notes provide extra information about the Note. See the following examples:



### 1.6.2 Caution, Warning, and Danger icons

The icons used in combination with Caution, Warnings, and Dangers indicate the type of hazard present. See the following examples:



## 1.7 Conversion tables

In this manual, SI units are used to express lengths, masses, temperatures etc. These can be converted to non-metric units using the following information.

*table 1.1: Conversion of units of length*

1 in =	25.4 mm	1 mm =	0.03937 in
1 in =	2.54 cm	1 cm =	0.3937 in
1 ft =	0.3048 m	1 m =	3.281 ft
1 mi =	1.609 km	1 km =	0.622 mi

*table 1.2: Conversion of units of mass*

1 lb =	0.4536 kg	1 kg =	2,2046 lb
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*table 1.3: Conversion of units of pressure*

1 psi =	68.95 hPa	1 hPa =	0.0145 psi
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### Note

1 hPa = 1 mbar.

*table 1.4: Conversion of units of temperature*

$^{\circ}F = \frac{9}{5} \cdot (^{\circ}C + 32)$	$^{\circ}C = \frac{5}{9} \cdot (^{\circ}F - 32)$
--------------------------------------------------	--------------------------------------------------

## 2 Description

### 2.1 The Plena product range

The Plena Easy Line Power Amplifier is part of the Plena product range. Plena provides public address solutions for places where people gather to work, worship, trade, or relax. It is a family of system elements that are combined to create public address systems tailored for virtually any application.

The Plena product range includes:

- mixers
- preamplifiers
- power amplifiers
- a music source unit
- a digital message manager
- a feedback suppressor
- call stations
- an All-in-One system
- a voice alarm system
- a timer
- a charger
- a loop amplifier

The various elements are designed to complement each other thanks to matched acoustical, electrical and mechanical specifications.

### 2.2 Contents of box

The packaging box contains the following contents:

- PLE-1P120-US, or PLE-1P240-US
- Power cord
- Mounting brackets (LBC 1901/00)
- XLR cable

### 2.3 The Plena Power Amplifier

The Plena Power Amplifier is a high performance power amplifier for use in professional public address systems. For a schematic overview of the Plena Power Amplifier, see figure 2.1 on the next page.

The Plena Power Amplifier is provided with one line input with a loop through output.

A 70 V slave input gives connection to existing loudspeaker lines. This input is converted to 1 V and fed to the input. The 1 V and 70 V input is summed.

The Plena Power Amplifier has 25 V and 70 V constant voltage output and a low impedance output for 4 Ohm loudspeakers.

The Plena Power Amplifier has an overload and a short-circuit protection. A temperature controlled fan and overheat protection ensures high reliability.

An LED meter monitors the master output. This signal is also present on the headphone socket below the output level meter. For total reliability and ease of use, a limiter is integrated into the output stage to restrict output if the user applies too much signal.

The unit has 24 VDC backup input with built in 24 VDC battery charger. A separate battery charger is, therefore, not required. The charger charges the battery with a 0.5 A constant current until the battery voltage reaches 27.4 VDC. The charger then switches over to constant voltage charging (also known as float charging).



#### Note

When using the unit with backup power of 24 V, make sure that the unit is always powered ON. When the unit is switched OFF, the batteries will be drained as this will be regarded as a power source. Consequently the unit will revert to 24 VDC power from the 24 V input.

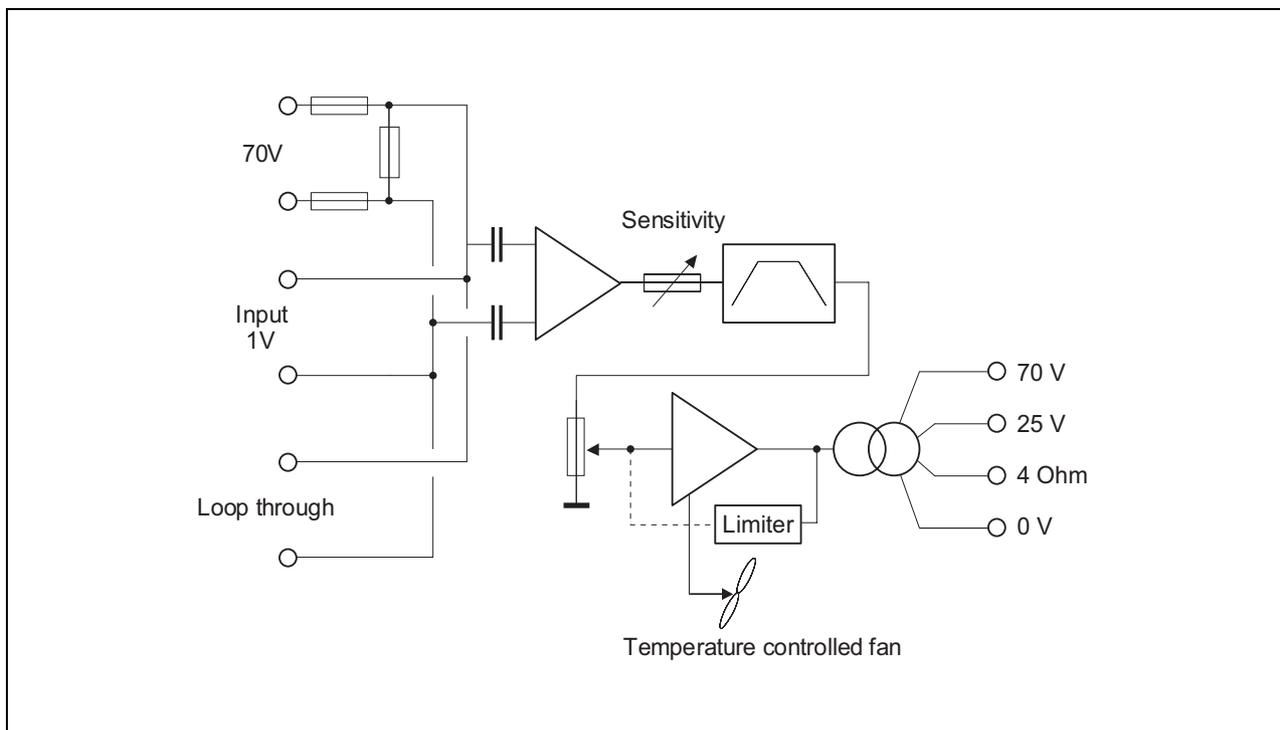


figure 2.1: Schematic overview of the Plena Power Amplifier

## 2.4 Controls, connectors and indicators

### 2.4.1 Front panel

See figure 2.2 for an overview of the controls and indicators.

- 1 Power button.
- 2 Output level meter (-18 db, 0 db).
- 3 Air inlet holes.



#### Note

Do not obstruct the airflow into the unit.

- 4 Headphone socket.

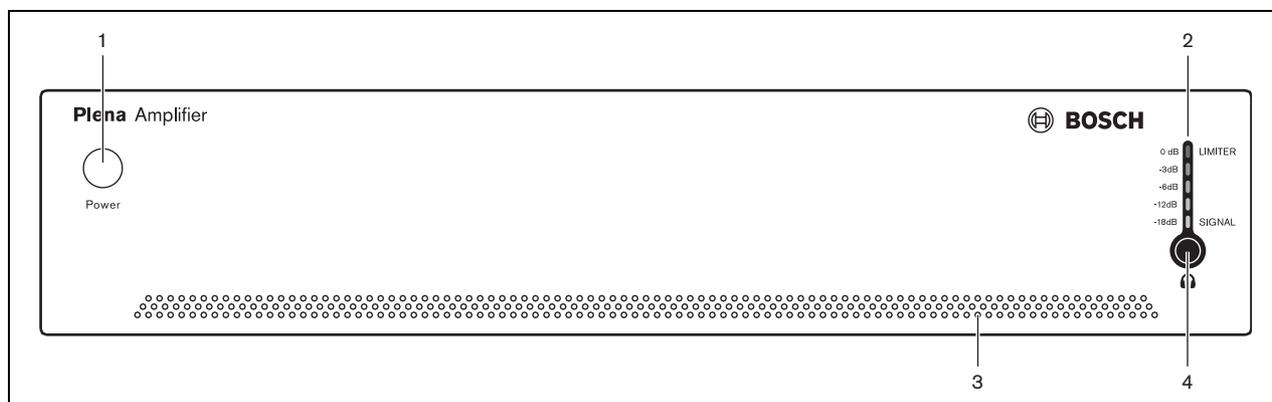


figure 2.2: Front panel

## 2.4.2 Rear panel

See figure 2.3 for an overview of the connectors and switches:

- 1 Cooling fan.



### Note

Always allow adequate space at the rear of the unit for ventilation.

- 2 70 V input, Euro style pluggable screw terminal connector. Input is wired in parallel with the line input (see number 4).
- 3 Input volume control - control range -25 dB to 0dB (see numbers 2 and 4).
- 4 Line input, Euro style pluggable screw terminal connector. Input is wired in parallel with 70 V input (see number 2). The line input is combined with the loop through output (Euro style pluggable screw terminal connector).

- 5 Outputs and 24 VDC in/out:
  - Outputs, Euro style pluggable screw terminal connector - 70 V, 25 V and 4 Ohm.
  - 24 VDC in/out:
    - Input: 24 VDC backup power.
    - Output: built in charger, maximum 0.5 A. regulated output current.
- 6 Mains voltage selector, C13 - 115/230 VAC 50/60 Hz.
- 7 Mains fuse.
- 8 Ground connection screw.



### Note

The unit must be grounded.

- 9 Mains connector (3-pole).

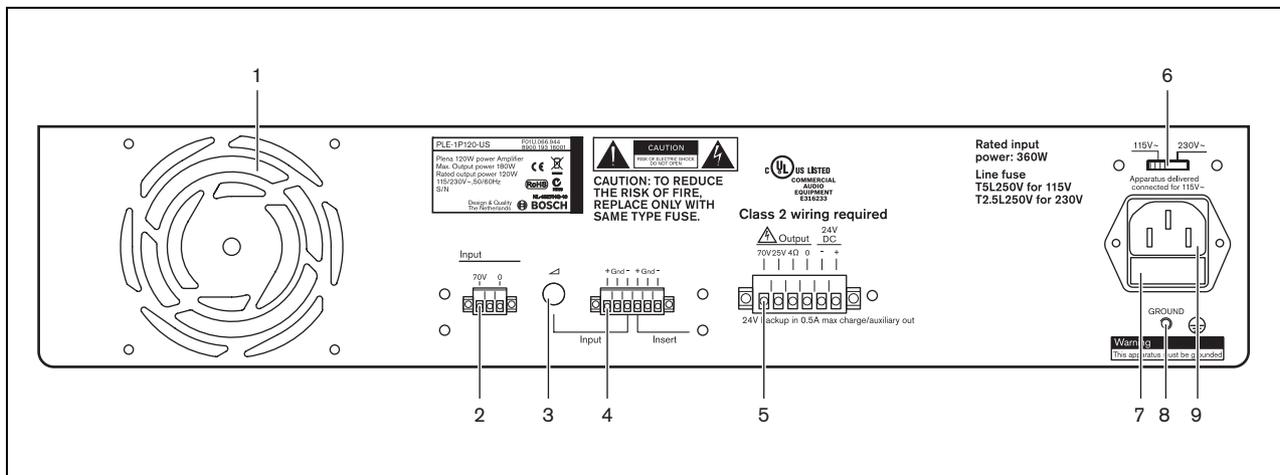


figure 2.3: Rear panel

## 3 Installation

### 3.1 Unpack unit

- 1 Remove the unit from the box, and discard the packaging material according to local regulations.

### 3.2 Install unit in rack (optional)

The Plena Easy Line Power Amplifier is intended for tabletop use, but you can also mount the unit in a 19" rack (see figure 3.1).

If you mount the unit in a rack, you must:

- ensure that it does not exceed the overheating temperature (55 °C ambient).
- use the included Bosch mounting brackets (LBC 1901/00).
- remove the 4 feet from the bottom of the unit.

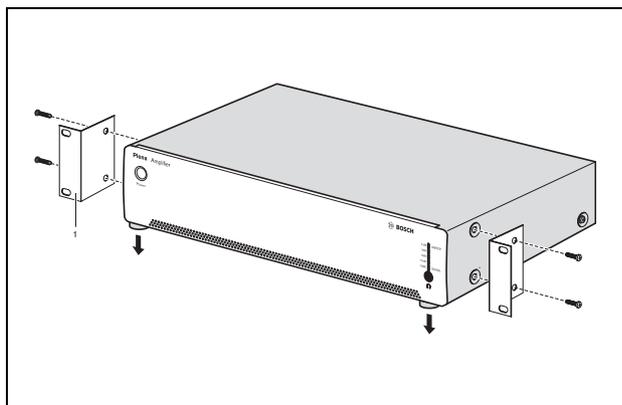


figure 3.1: Installing the unit in a rack

### 3.3 Check settings/connections

- 1 Connect any additional equipment (see section 4.1 and 4.2).

### 3.4 Connect unit to mains



#### Caution

Potential equipment damage. Before connecting power, always check the voltage selector on the rear panel of the unit.

- 1 Make sure the voltage selector (115/230 VAC) is correctly set for the country's main voltage (see figure 3.2).
- 2 Make sure the power button on the front of the unit is set to Off.
- 3 Connect the power cord to the mains connector and plug it into the mains outlet.

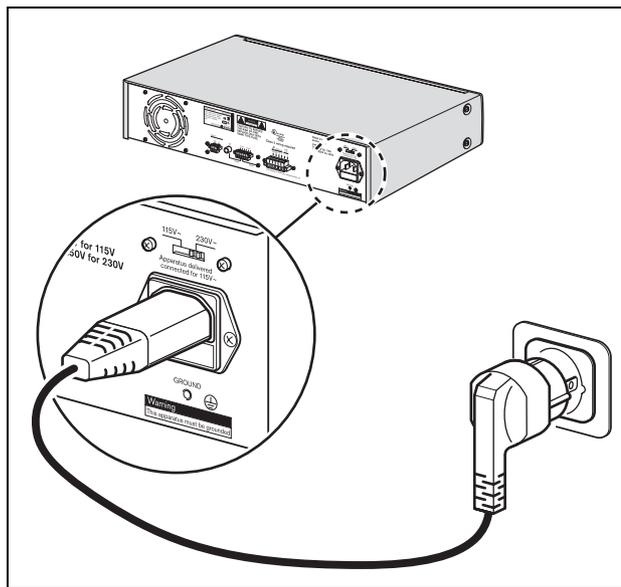


figure 3.2: Power connection and voltage selector

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## 4 Connections and settings

### 4.1 Connecting inputs

#### 4.1.1 DC supply (battery)



##### Caution

The connection cable must have an in-line fuse. Use the type of fuse shown in the following figure.



##### Caution

Make sure the unit is earthed.

The Plena Power Amplifier has a 24 VDC input (terminal screw). This input can be used in mobile applications, such as boats where 115 or 230 VAC is not available or in applications that must continue to operate in case of a power failure.

When a 24 VDC battery is connected (typically consisting of two 12 VDC lead-acid batteries in series), the unit will operate on the supplied DC voltage.

The Plena Power Amplifier has as a built in charger, which charges the connected battery (or batteries if connected in series). A separate battery charger is, therefore, not required. The charger charges the battery with a 0.5 A constant current until the battery voltage reaches 27.4 VDC. The charger then switches over to constant voltage charging (also known as float charging). This means that a battery can be charged at the same rate it is discharging, and thus full capacity battery can be assured.

This type of charging is suited for low duty-cycle applications where a relatively high current or power is infrequently required.



##### Note

If the backup power system has to comply to the EN54-4 standard or similar standards for backup power and charging speeds, Bosch recommends the PLN-24CH10.

The PLN-24CH10 is a dedicated battery charger and power supply that is fully EN54-4 compliant.

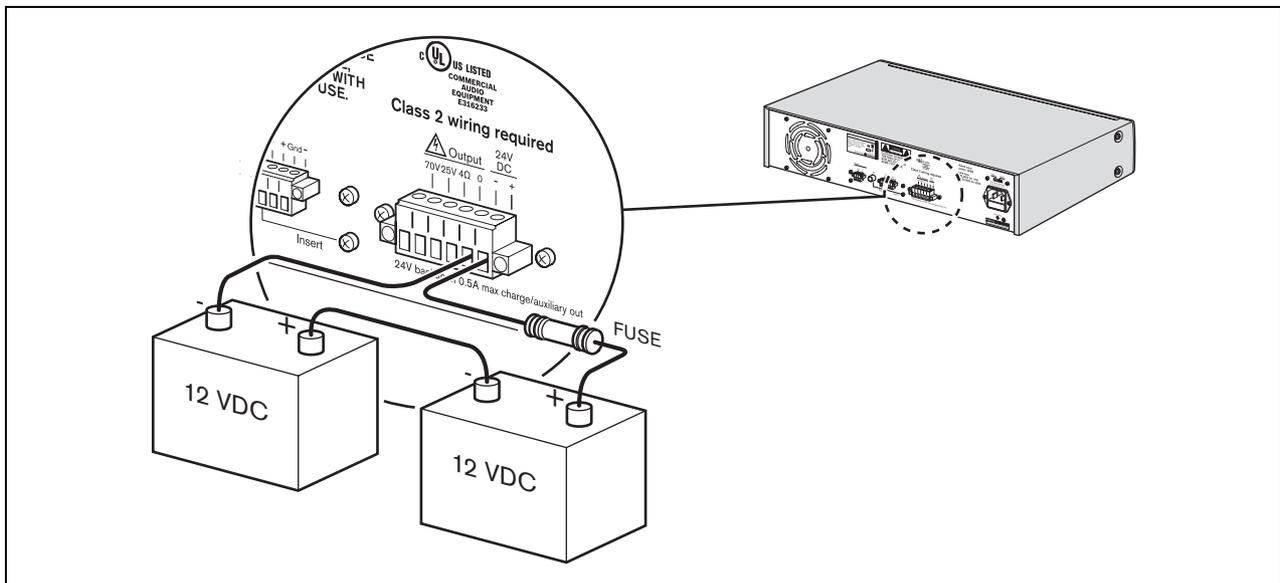


figure 4.1: Connecting a DC power supply

### 4.1.2 70 V input

The 70 V input is used to connect directly to a 70 V line (slave operation).

A 70 V input signal can be connected to the Euro style pluggable screw terminal connector (2) at the rear of the unit as shown in figure 4.2.

To adjust the volume of the input signal, turn the input volume control (3) at the rear of the unit.

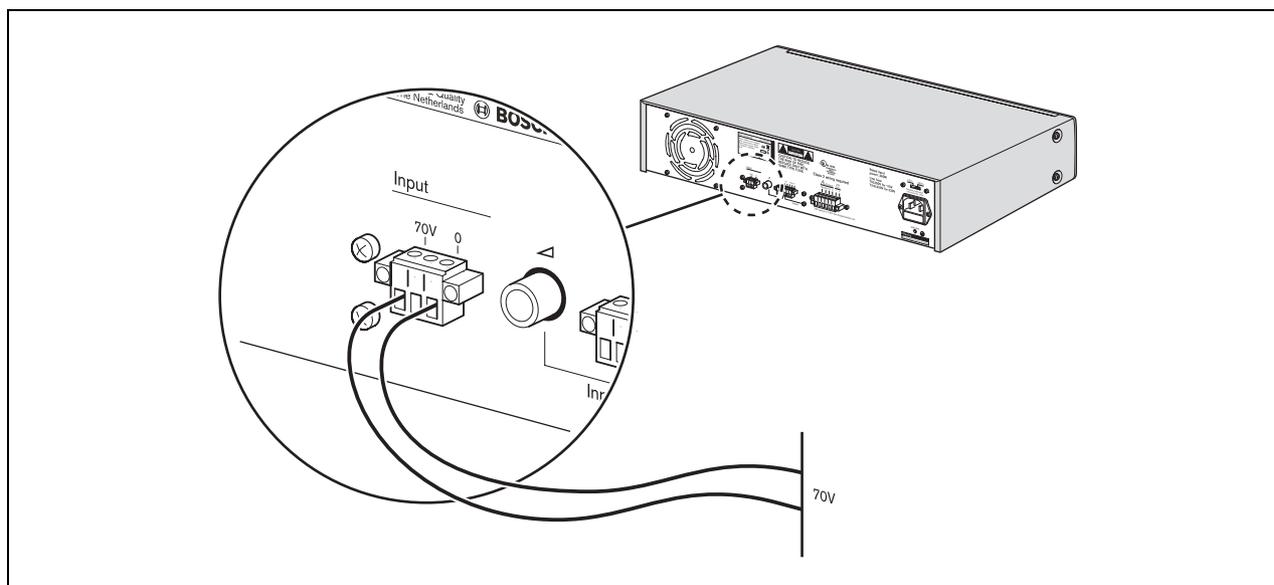


figure 4.2: Connecting a 70 Volt input signal

## 4.2 Connecting speakers

Connect speakers to the 25 V, the 70 V or the 4 Ohm terminals on the Euro style pluggable screw terminal connector (5) at the rear of the unit.

### 4.2.1 Constant voltage loudspeakers

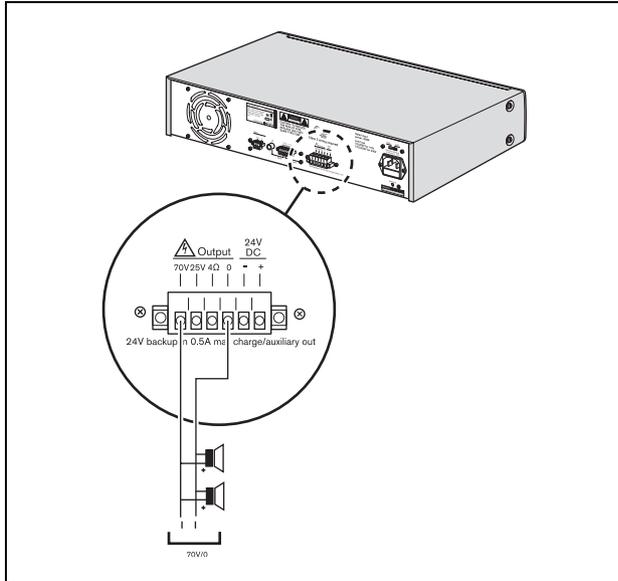


figure 4.3: Connecting speakers

The power amplifier can drive 25 V and 70 V constant voltage loudspeakers. The 70 V connection is shown in figure 4.3.

Connect the loudspeakers in parallel and check the loudspeaker polarity for in-phase connection. The summed loudspeaker power should not exceed the rated amplifier output power.

### 4.2.2 Low impedance loudspeakers

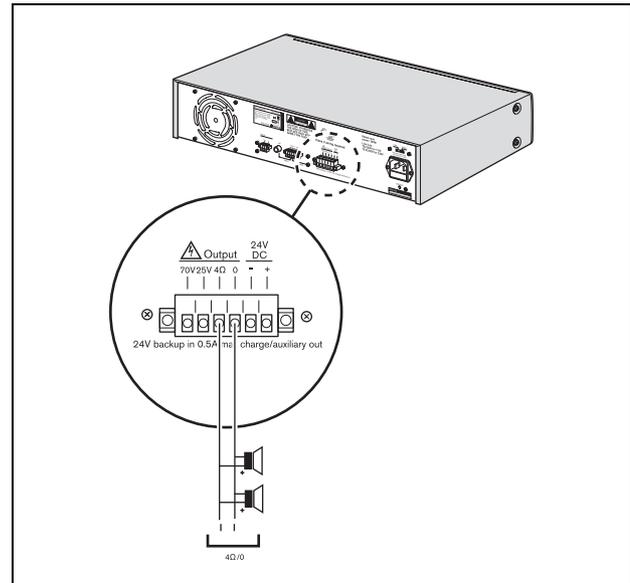


figure 4.4: Connecting speakers

Connect low impedance loudspeakers to the 4 Ohm/0 terminals. This output can deliver the rated output power into an 4 Ohm load. Connect multiple loudspeakers in a series/parallel-arrangement to make the combined impedance 4 Ohm or higher. Check the loudspeaker polarity for in-phase connection.

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## 5 Operation

### 5.1 Switch on and off

#### 5.1.1 Switch on



#### Caution

Potential equipment damage. Before applying power, always check the mains voltage selector at the rear of the unit.

- 1 Make sure the mains voltage selector (115/230 VAC) is correctly set for the country's main voltage (see figure 5.1).
- 2 Set the power button (1) on the front of the unit to Off - popped out.

#### 5.1.2 Switch off

Set the power button (1) on the front of the unit to Off - popped out.

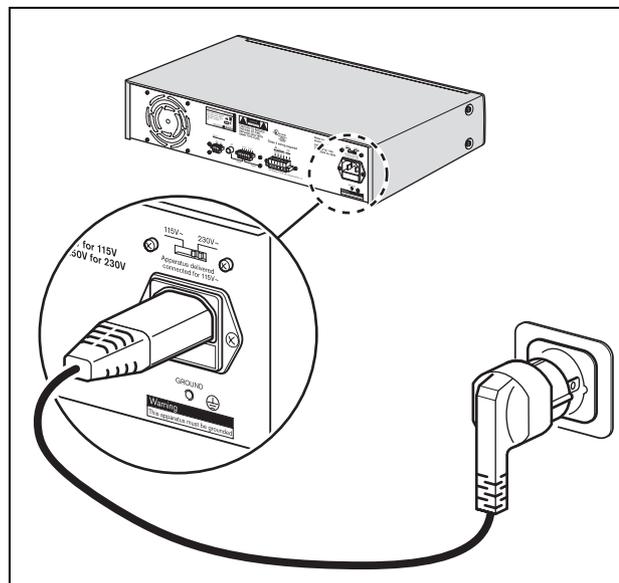


figure 5.1: Voltage selector

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## 6 Technical data

### 6.1 Electrical

#### 6.1.1 Mains power supply

**Voltage**

115 - 230 VAC,  $\pm 10\%$ , 50/60 Hz

**Inrush Current PLE-1P120-US**

8/16 A (230/115 VAC)

**Inrush Current PLE-1P240-US**

9/19 A (230/115 VAC)

#### 6.1.2 Battery power supply

**Voltage**

24 VDC,  $\pm 15\%$

**Current PLE-1P120-US**

6 A

**Current PLE-1P240-US**

12 A

**Charge current**

0.5 ADC

**Charge float voltage**

27.4 VDC

#### 6.1.3 Power consumption

**PLE-1P120-US (mains)**

400 VA

**PLE-1P240-US (mains)**

800 VA

#### 6.1.4 Performance

**Frequency response**

50 Hz to 20 kHz (+1/-3 dB @ -10 dB ref. rated output)

**Distortion**

<1% @ rated output power, 1 kHz

#### 6.1.5 Line input - loop through output

**Line input**

Euro style pluggable screw terminal connector, balanced, phantom

**Loop through output**

Euro style pluggable screw terminal connector, balanced, phantom

**Sensitivity**

1 V

**Impedance**

>1 kohm (mic); >5 kohm (line)

**S/N**

63 dB

**Dynamic range**

100 dB

**CMRR**

>40 dB (50 Hz to 20 kHz)

#### 6.1.6 70 V input

**Connector**

4-pin, Euro style pluggable screw terminal

**Sensitivity 70 V**

70 V adjustable

**Impedance**

>10 kohm

**S/N (flat at max volume)**

>65 dB

#### 6.1.7 Loudspeaker outputs 70 V\*

**Connector**

Euro style pluggable screw terminal, floating

**Max / rated PLE-1P120-US**

180 W / 120 W

**Max / rated PLE-1P240-US**

360 W / 240 W

#### 6.1.8 Loudspeaker output 4 Ohm\*

**Connector**

Euro style pluggable screw terminal, floating

**PLE-1P120-US**

31 V (120 W)

**PLE-1P240-US**

44 V (240 W)

\* Subtract 1 dB for 24 V battery operation.

## 6.2 Mechanical

**Dimensions (H x W x D)**

100 x 430 x 270 mm (19" wide, 2U high)

**Mounting**

Stand-alone, 19" rack

**Color**

Charcoal

**Weight (PLE-1P120-US)**

Approx. 10.5 kg

**Weight (PLE-1P240-US)**

Approx. 12.5 kg

## 6.3 Environmental

**Operating temperature**

-10 to +55 °C

**Storage temperature**

-40 to +70 °C

**Relative humidity**

<95%

**Acoustic noise level of fan**

<33 dB SPL @ 1 m temperature control



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Data subject to change without notice

2008-02 | PLE-1P120-US, PLE-1P240-USen

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