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Invented for life

# PLE-2MAxx0-EU Plena Mixer Amplifier



- ▶ **6 microphone/line inputs plus 3 music source inputs**
- ▶ **100 V, telephone and a call station input with priority & VOX**
- ▶ **2 zones and announcement only output**
- ▶ **Voice activated emergency override**
- ▶ **High output power 120 and 240 Watts**
- ▶ **2-tone chime built in (7 more chimes optional with call station)**
- ▶ **Outputs for line out, music only out and insert point**
- ▶ **24 V backup input with built in 24 V charger**
- ▶ **Separate tone controls for microphones and music sources**

These Plena mixer amplifiers are high performance, professional public address units with modern state of the art features. They are easy to use, taking the complexity away from the user and putting it where it belongs, inside the equipment. Providing a crisp call or clear music is as easy as turning on the radio.

The amplifier is also surprisingly affordable, without sacrificing features such as ducking, priority and flexibility.

## Functions

### Microphone and line inputs

All Mic/line inputs can be switched between microphone level and line level sensitivity. The inputs are balanced but can be used unbalanced. Phantom power can be switched on to provide power to condenser microphones.

Input channels 1 and 2 can take priority over all other microphone and music inputs:

- Input 1 can be activated by contact closure on the PTT (push to talk). A 2-tone chime can be configured to precede an announcement.
- Input 2 can be switched automatically if a signal is fed to the input i.e. if someone speaks into the microphone (VOX activation).

When one or both inputs are configured to have priority, the amount of attenuation (reduction) of the cinch inputs, can be set between -2 dB (little attenuation) or  $-\infty$  dB (mute). This provides a talk-over or voice-over function. Input channels 1 and 2 also feature selectable speech filters to enhance the clarity of announcements.

### Music inputs

Separate music inputs are available with their own input selector and volume control. The user can choose a music source like a CD player or radio (like the PLN-DVDT), and set the level of music.

You can set the desired sound for the music source separate from the mic/line inputs. So if the music needs boosted low frequencies, this does not lead to muddy sounding voices from the microphones. A truly unique feature in its class.

### Personalized settings

More unique features are available such as detachable labels where the user can write the names for inputs, music sources and zones. These labels can then be mounted on the front, protected by the clear window.

Another useful feature is to indicate preferred settings on the front panel by inserting colored pins at the preset levels of all knobs. You can then instruct a user to set all the controls to the silver pins to configure the system for their particular use. A second user can set all controls to the red pins for their configuration.

### Tone controls

The unique tone controls provide separate control for mic/line inputs and music inputs so that the voice on the microphones can be specifically optimized for excellent speech or singing. Correspondingly, the tone controls for background music provide the most appropriate music reproduction.

In addition, the tone controls are not standard bass and treble controls. Our experience has led us to develop a tone control that can be used as a traditional tone control with high and low control, but has a powerful contour that addresses the problems found in real situations.

The tone control for the microphone and line inputs boosts warmth in voices without boosting rumble and cuts rumble without losing warmth in the low frequencies. In the high frequencies, the tone control boosts sparkle without adding sharpness, but when cutting is first, cuts harshness and sharpness without reducing clarity.

The tone control for the music inputs boosts deep bass first without making the sound boomy, and cuts rumble without losing warmth in the low frequencies. In the high frequencies the tone control is similar to the microphone inputs, with slightly different frequencies to suit music reproduction.

For easy integration with another PA system or a telephone paging system, a telephone / 100 V emergency input with VOX activation is provided. It has its own preset volume control and overrides all other inputs, including call station and inputs 1 and 2. The unit also has a line output to add amplifiers for larger systems, with more output power, this output can be switched to music only so that for instance music on hold can be provided for the telephone system. Insert (loop through) input and output connections enable external sound processing equipment, such as an equalizer or the Plena feedback suppressor, to be connected between the preamplifier and the power amplifier stages.

### Power

These Plena mixer amplifiers come in 120 and 240 Watts output power. This power is directly available on 100 V constant voltage connections and on a low impedance connection for an 8 ohm load. Moreover, the amplifiers have a separate 100 V call-only output channel for addressing areas where only priority announcements are required. The call-only output can also be used for 3-wire remote, volume control override.

### Zones

The mixer amplifier has two zone outputs. The music can be switched on and off in the zones via the front panel and optional wall panel. Announcements from the PLE-2CS two-zone call station can be routed to zone 1 or zone 2, or both. Announcements from the tel/100 V input or inputs 1 & 2 are routed to both zones. Input 1 can be used for a PLE-1CS all-call call station or any other microphone or call station with a PTT contact.

### Output status

An LED VU meter monitors the master output. A headphone socket, below the VU meter, provides the mixer output before zone selection so that it is possible to listen to the output before the signal is sent to the zone. 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.

### Controls and indicators

#### Front

- On/off switch
- Power on LED
- LED VU meter for master output (LEDs for -18, -12 -6, -3, 0 dB)
- Master volume knob
- Six volume knobs for microphone inputs
- Knob for treble level
- Knob for bass level
- Headphone socket
- Two zone selector buttons
- Background music button

#### Back

- Dip switches
- Chime level
- Ducking level
- Tel/100 V volume control

### Interconnections

See Technical Specifications.

## Certifications and Approvals

Safety	acc. to EN 60065
EMC emission	acc. to EN 55103-1
EMC immunity	acc. to EN 55103-2

**Installation/Configuration Notes**



Rear view

**Parts Included**

Quantity	Components
1	PLE-2MA120-EU / PLE-2MA240-EU Plena Mixer Amplifier
1	Power cord
1	Manual
1	Set of 19" mounting brackets
1	Plena Easy Line CD

**Technical Specifications**

**Electrical**

**Mains power supply**

Voltage	115 - 230 VAC ±10%, 50/60 Hz
Inrush Current PLE-2MA120-EU	8/16 A (230/115 VAC)
Inrush Current PLE-2MA240-EU	9/19 A (230/115 VAC)

**Battery power supply**

Voltage	24 VDC, +10% / -15%
Current PLE-2MA120-EU	6 A
Current PLE-2MA240-EU	12 A
Charge current	0.5 ADC
Charge float voltage	27.3 VDC

**Power consumption**

PLE-2MA120-EU (mains)	400 VA
PLE-2MA240-EU (mains)	800 VA

**Performance**

Frequency response	50 Hz to 20 kHz (+1/-3 dB @ -10 dB ref. rated output)
Distortion	<1% @ rated output power, 1 kHz
Low Control	Max -12/+12 dB (frequency is setting dependent)
Hi Control	Max -12/+12 dB (frequency is setting dependent)

**RJ-45 input**

**2 x**

Call station input	For PLE-2CS(MM)
Wall panel input	For PLE-WP3S2Z

**Mic/line input**

**6 x**

Input 1 (Push-to-talk contact with ducking functionality)	5-pin Euro style, balanced, phantom 3-pin XLR, balanced, phantom
Input 2-6 (VOX with ducking functionality on input 2)	3-pin XLR, balanced, phantom
Sensitivity	1 mV (mic); 1 V (line)
Impedance	>1 kohm (mic); >5 kohm (line)
S/N (flat at max volume)	63 dB
S/N (flat at min volume/muted)	>5 dB
Dynamic range	93 dB
S/N (flat at max volume)	>63 dB (mic); >70 dB (line)
S/N (flat at min volume/muted)	>75 dB
CMRR (mic)	>40 dB (50 Hz to 20 kHz)
Headroom	>17 dB
Speech filter	-3 dB @ 315 Hz, high-pass, 6 dB/oct
Phantom power supply	16 V via 1.2 kohm (mic)
Speech filter	-3 dB @ 315 Hz, high-pass, 6 dB/oct
VOX (input 1 & 2)	attack time 150 ms; release time 2 s

**Music inputs**

**3x**

Connector	Cinch, stereo converted to mono
Sensitivity	300 mV
Impedance	22 kohm
S/N (flat at max volume)	>70 dB
S/N (flat at min volume/muted)	>75 dB
Headroom	>25 dB

**Emergency / telephone**

**1 x**

Connector	7-pin, Euro style pluggable screw terminal
Sensitivity tel	1 V maximum
Sensitivity 100V	100 V maximum
Impedance	>10 kohm

<b>Emergency / telephone</b>	<b>1 x</b>
S/N (flat at max volume)	>65 dB

VOX	threshold 50 mV; attack time 150 ms; release time 2 s
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<b>Insert</b>	<b>1 x</b>
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Connector	Cinch
-----------	-------

Nominal level	1 V
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Impedance	>10 kohm
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<b>Master/music output</b>	<b>1 x</b>
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Connector	3-pin XLR, balanced
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Nominal level	1 V
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Impedance	<100 ohm
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#### Loudspeaker outputs 100 V\*

Connector	Screw, floating
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Max / rated PLE-2MA120-EU	180 W / 120 W
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Max / rated PLE-2MA240-EU	360 W / 240 W
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#### Loudspeaker output 8 ohm\*

Connector	Euro style pluggable screw terminal, floating
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PLE-2MA120-EU	31 V (120 W)
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PLE-2MA240-EU	44 V (240 W)
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\* Subtract 1 dB for 24 V battery operation.

#### Mechanical

Dimensions (H x W x D)	100 x 430 x 270 mm (19" wide, 2U high)
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Mounting	Stand-alone, 19" rack
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Color	Charcoal
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Weight (PLE-2MA120-EU)	Approx. 10.5 kg
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Weight (PLE-2MA240-EU)	Approx. 12.5 kg
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#### Environmental

Operating temperature	-10 °C to +45 °C
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Storage temperature	-40 °C to +70 °C
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Relative humidity	<95%
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Acoustic noise level of fan	<33 dB SPL @ 1 m temperature controlled
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#### Ordering Information

<b>PLE-2MA120-EU Plena Mixer Amplifier</b> 120 W, 10 input mixer amplifier	<b>PLE-2MA120-EU</b>
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<b>PLE-2MA240-EU Plena Mixer Amplifier</b> 240 W, 10 input mixer amplifier	<b>PLE-2MA240-EU</b>
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**Represented by**

# Plena Mixer Amplifier



Security Systems

en | Installation and User Instructions  
PLE-2MA120-EU  
PLE-2MA240-EU

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## Important safeguards

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.

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 Mixer 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

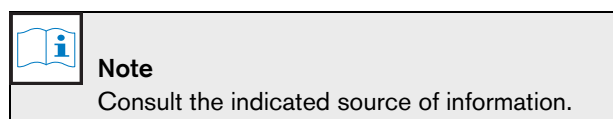
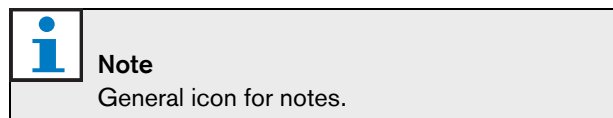
Four types of alerts are used in this manual. The alert type is closely related to the effect that may be caused if it is not observed. These alerts - from least severe effect to most severe effect - are:

- **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

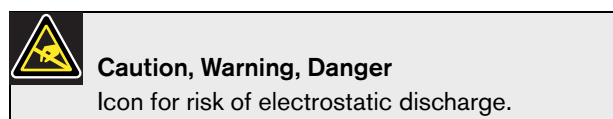
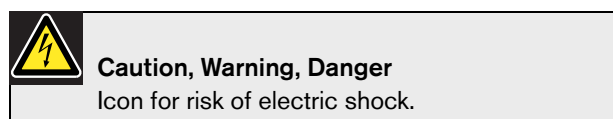
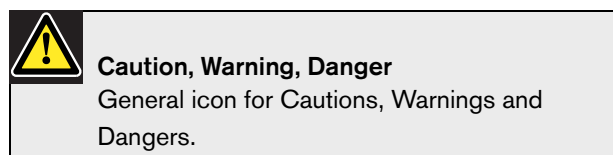
### 1.6.1 Note icons

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*

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

### 2.1 The Plena product range

The Plena Mixer 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-2MA120-EU, or PLE-2MA240-EU
- Labels and colored pins for indicating favorite settings
- Power cord
- Plena Bonus CD
- Mounting brackets (LBC 1901/00)

### 2.3 The Plena Mixer Amplifier

The Plena Mixer Amplifier is a high performance, professional public address unit for mixing up to six separate microphone/line signals, and any one of three separate music signals. For a schematic overview of the Plena Mixer Amplifier, see figure 2.1 on the next page.

The volume of each microphone/line signal can be individually adjusted to obtain the required mix; the mixed output is controlled via the master volume control and separate high/low tone controls.

The unit is easy to use, and provides a crisp call or clear music. The amplifier also has enhanced features such as ducking level control, priority, labelling, and setting indicators.

All Microphone/line inputs can be switched between microphone level and line level sensitivity. The inputs are balanced but can also be used unbalanced. Phantom power can be selected via a DIP switch to provide power to condenser microphones. Input channels 1 and 2 can take priority over all other microphone and music inputs:

- Input 1 can be activated by contact closure on a PTT (push to talk). A chime can be configured to precede an announcement.
- Input 2 can be switched automatically if a signal is available at the input, for example, if someone speaks into the microphone (VOX activation).

A telephone/100 V emergency input with VOX activation is also provided for easy integration with another PA system or a telephone paging system. It has its own volume control and overrides all other inputs, including the call station and inputs 1 and 2.

The unit also has a line output to add amplifiers for larger systems that require more output power. This output can be switched to music only, for example, so that music on hold can be provided for the telephone system. Loop through input and output connections enable external sound processing equipment (for example, an equalizer or Plena feedback suppressor) to be connected between the preamplifier and the power amplifier stages. A feedback suppressor can ensure feedback-free, clear speech for all microphones.

Users can create custom labels for inputs, music sources, and output zones. These labels can be attached to the special holders at the front of the mixer amplifier. Colored pins can also be inserted at various positions around the volume and tone dial controls to indicate favorite settings for a particular application.

An LED meter monitors the master output before the zone selection. This signal is also present on the headphone connector below the output 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

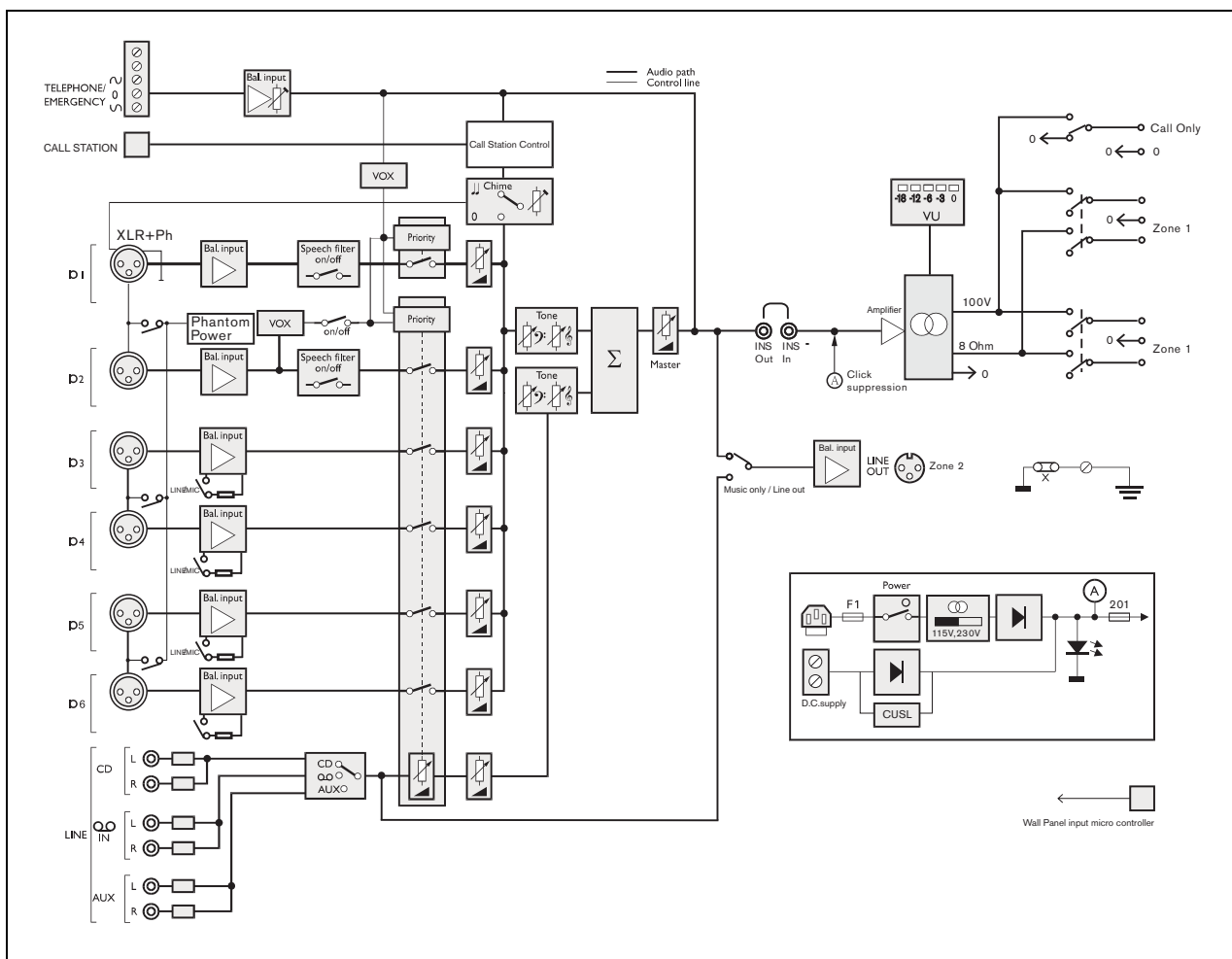


figure 2.1: Schematic overview of the Plena Mixer Amplifier

## 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 Label holder for user-defined description of microphone/line inputs - custom labels can be created by user.
- 3 Master high tone control for microphone/line inputs.
- 4 Label holder for user-defined description of music sources - custom labels can be created by user.
- 5 Master high tone control for music inputs.
- 6 Label holder for user-defined description of zone names - custom labels can be created by user.
- 7 Master volume control - controls all inputs except emergency and call station.
- 8 Output level meter (-18 db, 0 db)
- 9 Input level control:
  - microphone/line 1
  - microphone/line 2
  - microphone/line 3
  - microphone/line 4
  - microphone/line 5
  - microphone/line 6
- 10 Master low tone control for microphone/line inputs.
- 11 Music source selector (for music inputs 1, 2, and 3).
- 12 Music source volume control.
- 13 Master low tone control for music inputs.
- 14 Zone 1 selection button.
- 15 Zone 2 selection button

16 Air inlet holes.

**i Note**  
Do not obstruct the airflow into the unit.

17 Headphone socket.

**i Note**  
Users can create custom labels for the: microphone/line inputs, description of the music sources, and audio output zones 1 and 2. These labels can be attached to the mixer amplifier at position numbers 2, 4, and 6 (see figure 2.2). Colored pins can also be inserted at various positions around the dial controls to indicate the favorite settings for a particular application. For more information on inserting and removing pins, see section 4.3.2.

### 2.4.2 Plena PLE-WP2Z3S wall panel

The optional Plena PLE-WP2Z3S wall panel can be used to remotely control the unit from a maximum of four remote locations. The appearance of the wall panel is matched to the Bosch loudspeaker volume controls.

The zone can be activated or deactivated, and the music source can be easily changed. The status of each zone and music source is indicated by an LED.

A standard CAT 5 cable is used to connect the wall panel to the mixer-amplifier. The maximum distance is 200 m. Please refer to the relevant datasheet for more information.

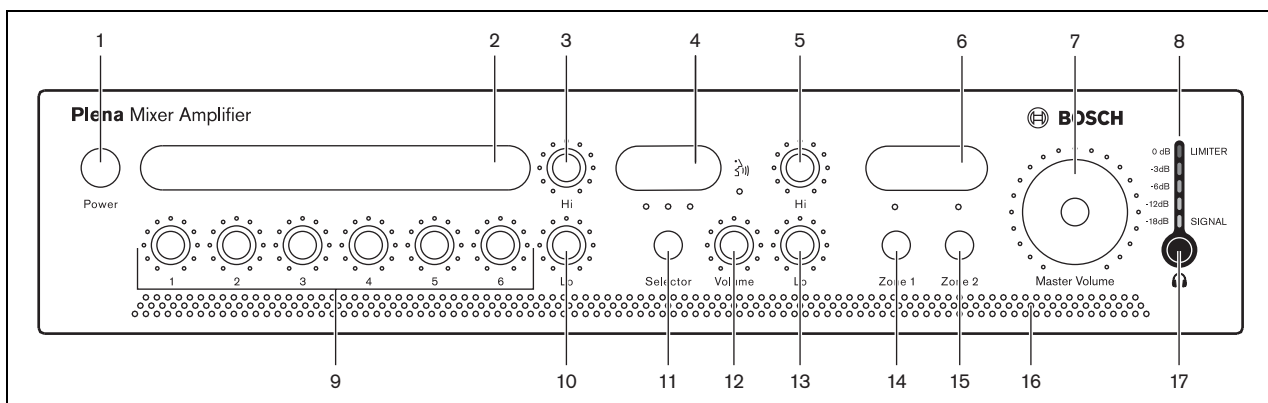



figure 2.2: Front panel

### 2.4.3 Rear panel


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

- 1 Cooling fan.

	<p><b>Note</b> Always allow adequate space at the rear of the unit for ventilation.</p>
---	---

- 2 Microphone/line 1 input, XLR connector - DIP switch settings for: chime, PTT (push to talk), mic/line, speech filter, and phantom power (see number 4). Input is wired in parallel with microphone/line 1, Euro style pluggable screw terminal connector (see number 3).
- 3 Microphone/line 1 input with trigger, Euro style pluggable screw terminal connector - DIP switch settings for: chime, PTT (push to talk), mic/line, speech filter, and phantom power (see number 4). Input is wired in parallel with microphone/line 1, XLR connector (see number 2).
- 4 DIP switch for microphone/line 1 and microphone/line 2 (see numbers 2 and 3, and 5 respectively).
- 5 Microphone/line 2 input, XLR connector - DIP switch settings for speech filter, mic/line, VOX, and phantom power (see number 4).
- 6 Microphone/line 3 input, XLR connector - DIP switch settings for mic/line, and phantom power (see number 7).
- 7 DIP switch for microphone/line 3 and microphone/line 4 (see numbers 6 and 8 respectively).
- 8 Microphone/line 4 input, XLR connector - DIP switch settings for mic/line, and phantom power (see number 7).
- 9 Microphone/line 5 input, XLR connector - DIP switch settings for mic/line, and phantom power (see number 10).
- 10 DIP switch for microphone/line 5 and microphone/line 6 (see numbers 9 and 11 respectively).
- 11 Microphone/line 6 input, XLR connector - DIP switch settings for mic/line, and phantom power (see number 10).
- 12 Mains voltage switch, C13 - 115/230 VAC 50/60 Hz.

- 13 Tel. emergency/100V input, Euro style pluggable screw terminal connector - VOX function. This input has highest priority.
- 14 Call station input, RJ-45 connector - PLE-2CS or PLE-2CS-MM, chimes are in call station. This input has second highest priority.
- 15 Remote control wall-panel-input, RJ-45 connector. Wall panel incorporates: BGM source selection, and zone on/off control.
- 16 Telephone emergency/100V input volume control - control range -25 dB to 0dB (see number 13).
- 17 Chime volume control for microphone/line input 1 (see numbers 2 and 3).
- 18 Ducking level control for microphone/line inputs 1 and 2 and call stations.
- 19 Music input (number 1 disc), 2x RCA/cinch connectors. Stereo, summed mono.
- 20 Music input (number 2 radio), 2x RCA/cinch connectors. Stereo, summed mono.
- 21 Music input (number 3 auxiliary), 2x RCA/cinch connectors. Stereo, summed mono.
- 22 Pre-out, amp in insert, 2x RCA/cinch connector - can be used for EQ or feedback suppressor.
- 23 Master switch for line out or music (see number 24).
- 24 Music master output, XLR connector - switch setting for line out, or music only (see number 23).
- 25 Outputs and 24 VDC in/out:
  - Zone 1 output, Euro style pluggable screw terminal connector - 100 V, and 8 Ohm.
  - Zone 2 output, Euro style pluggable screw terminal connector - 100 V, and 8 Ohm.
  - Call only, Euro style pluggable screw terminal connector 100 V.
  - 24 VDC in/out:
    - Input: 24 VDC backup power.
    - Output: built in charger, maximum 0.5 A. regulated output current. If battery charging is not required, output can be used for volume overrides or other purposes.
- 26 Mains fuse.
- 27 Earth connection screw.

	<p><b>Note</b> The unit must be earthed.</p>
---	--

- 28 Mains connector (3-pole).

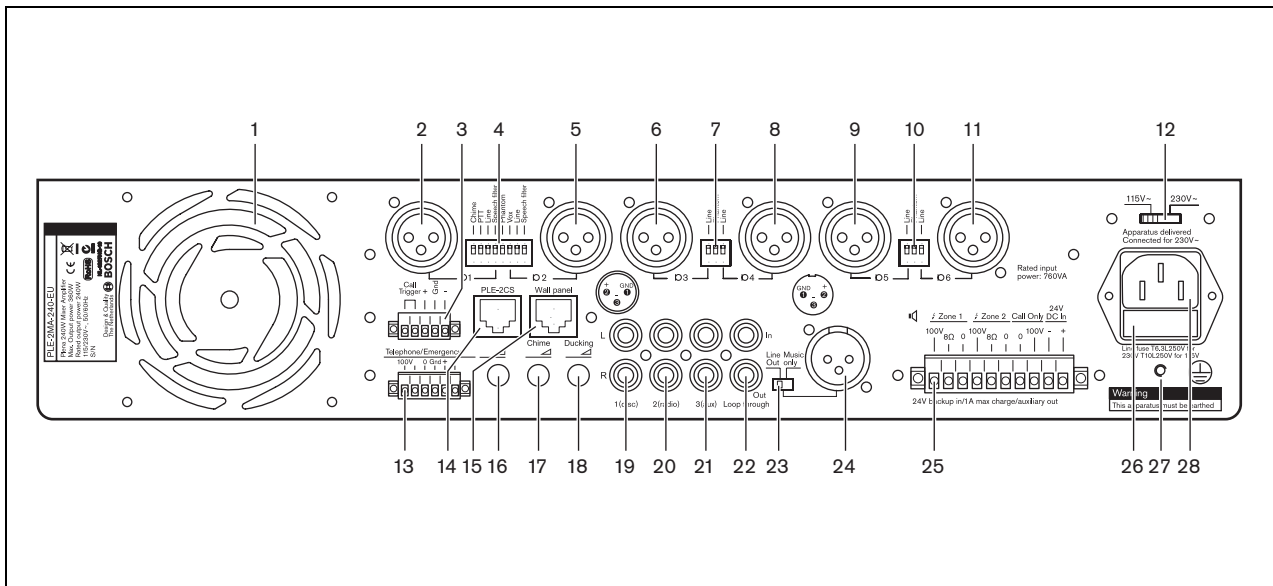


figure 2.3: Rear panel

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## 3 Installation

### 3.1 Unpack unit

- 1 Remove the unit from the box, and discard the packaging material according to local regulations.
- 2 Use your fingernails to carefully peel off the protective plastic film from the label holders. Do not use sharp or pointed objects.

### 3.2 Install unit in rack (optional)

The Plena Mixer 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.

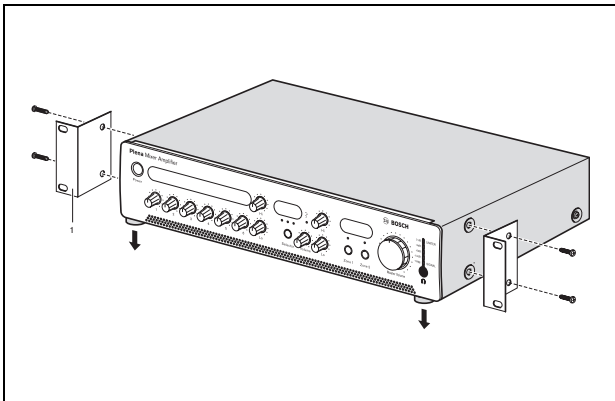


figure 3.1: Installing the unit in a rack

### 3.3 Check settings/connections

- 1 Connect any additional equipment (see section 4.1 and 4.2).
- 2 Check the settings (see section 4.3).

### 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 (115V/ 230V) is correctly set for the country's main voltage (see figure 3.2).
- 2 Make sure the power switch 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.

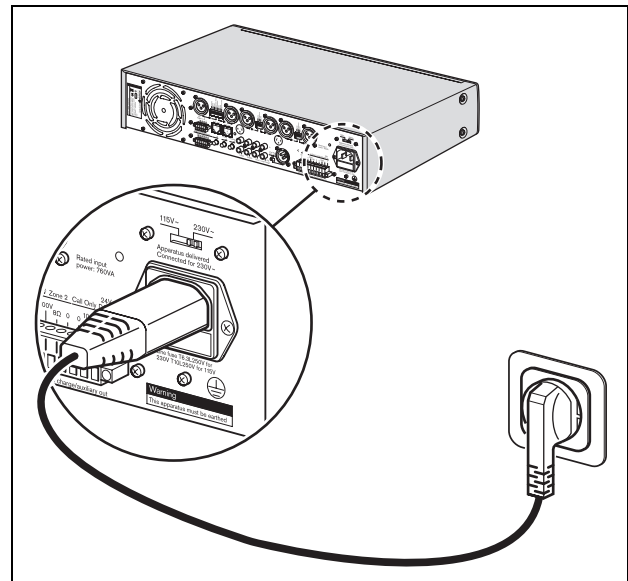


figure 3.2: Power connection and voltage selector

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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 Mixer Amplifier has a 24 VDC input (terminal screw). This input can be used in mobile applications, such as boats where 120 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 Mixer 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.



#### Note

If battery charging is not required, the 0.5 A maximum output current can be used for volume overrides or other purposes instead.

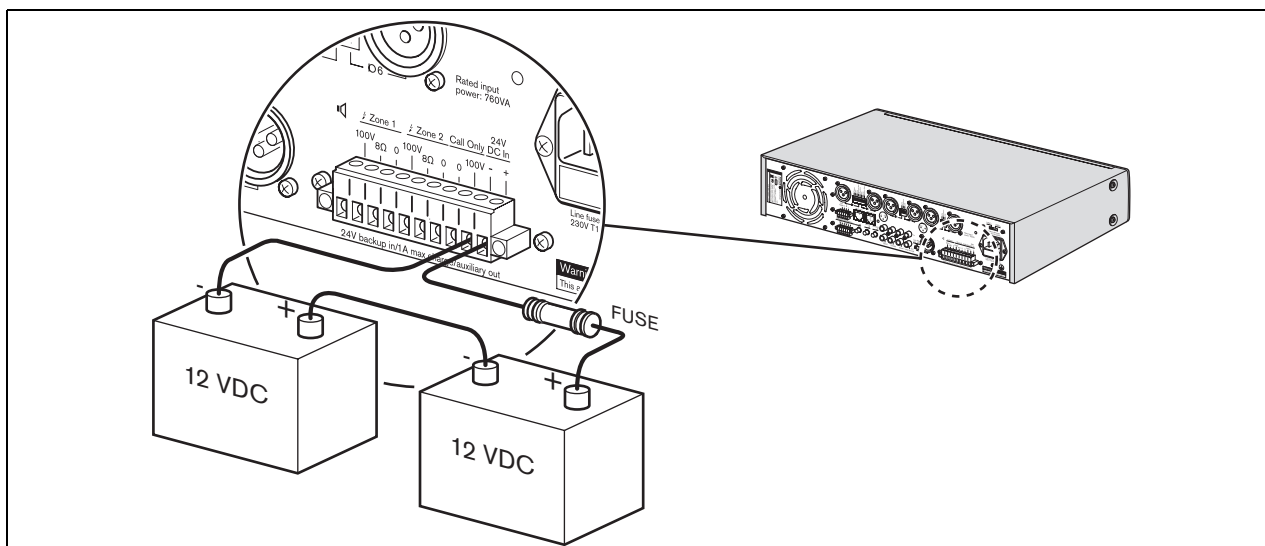


figure 4.1: Connecting a DC power supply

### 4.1.2 Priority microphone (input 1)

The priority microphone (or a generic call station) that can be used with push to talk (PTT) should be connected to “microphone/line 1 input”. The PTT mode can be activated by setting the DIP switch (4) at the rear of the unit. Microphone/line 1 input has priority over all other microphone/line inputs.

If, however, the “Tel. emergency/100V input” receives a signal, all inputs including microphone/line 1 input will be overruled.

The microphone/line 1 input has two connectors wired in parallel:

- an XLR connector (for a 3 pole microphone), and
- a Euro style pluggable screw terminal connector.

The Euro style pluggable screw terminal connector has a trigger input, which can be used in combination with the Euro and XLR connector.

The priority microphone can be connected to the microphone/line 1 input as follows:

- XLR connector only. See figure 4.2.
- XLR connector with trigger. See figure 4.3.
- Euro connector with trigger. See figure 4.4.
- Euro connector only (without trigger).



#### Note

If a microphone is connected to both the XLR connector and the Euro connector for the microphone/line 1 input, the input signals will be added together.

Set the DIP switch settings next to the XLR connector for microphone/line 1, as required. See section 4.3.



#### Note

When connecting an unbalanced line level (200 mV) signal to the microphone/line input, connect it as follows: Signal to pin 2, pin 1 and pin 3 to ground.

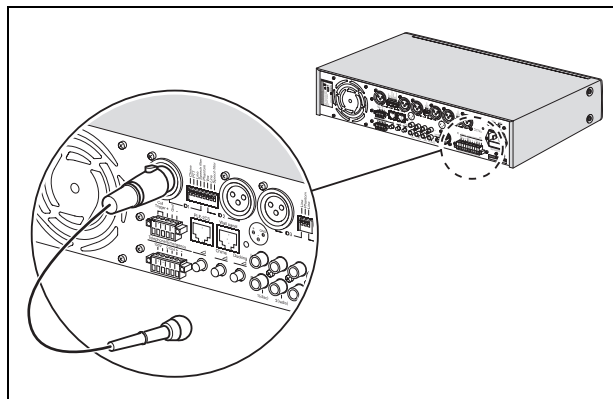


figure 4.2: XLR connector only

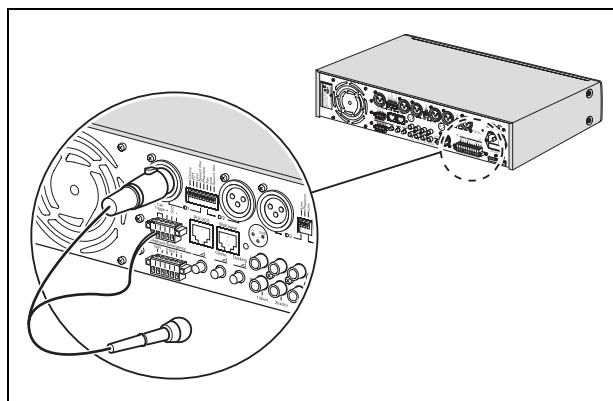


figure 4.3: XLR connector with trigger

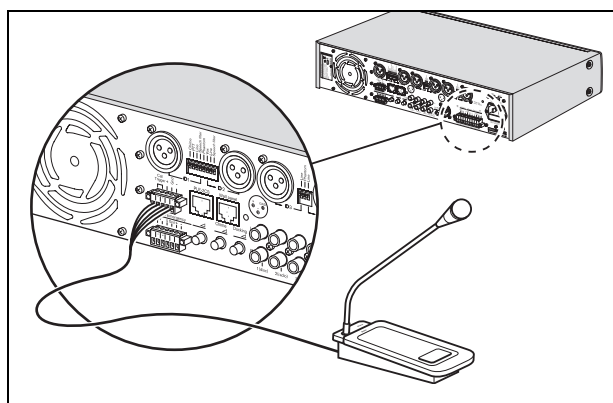


figure 4.4: Euro connector with trigger

### 4.1.3 Secondary microphone (input 2)

Connect a secondary microphone to “microphone/line input 2”. See figure 4.5.

Microphone/line input 2 has a DIP switch (4) at the rear of the unit for setting the VOX mode. If the DIP switch is set to VOX, the microphone/line input will automatically be switched when a signal is sensed at the microphone/line 2 input. For example, when someone speaks into the microphone, other sound will either be muted or ducked, depending on the setting of the ducking level control at the rear of the unit. See section 4.3.

The Tel. emergency/100V input, Call station input, and Microphone/line input 1 all have priority over the Microphone/line input 2. Therefore, any signal received on any one of these inputs will always be heard regardless of the ducking level control setting for Microphone/line input 2.

Set the DIP switch settings next to the XLR connector as required. See section 4.3.

### 4.1.4 Additional microphones (inputs 3 through 6)

Connect additional microphones to microphone/line inputs 3 through 6, as required. See figure 4.5. These microphones will mix with the background music.

Set the DIP switch settings next to the XLR connector for microphone/lines 3 through 6, as required. See section 4.3.

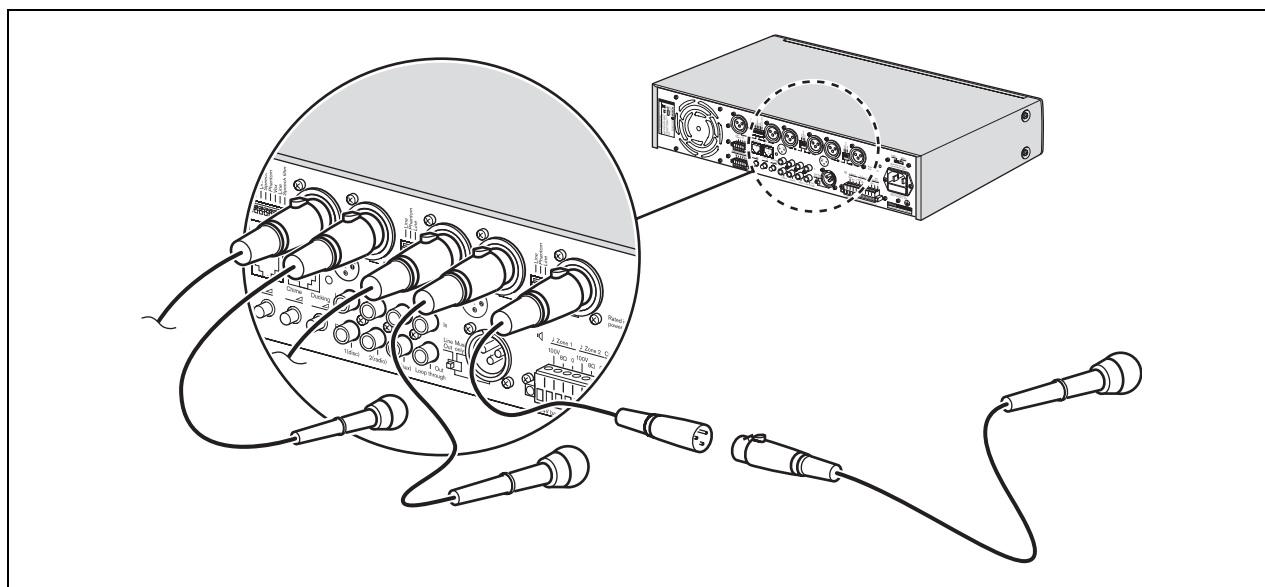


figure 4.5: Connecting microphone inputs

### 4.1.5 Emergency inputs

The Tel. emergency/100V input, with VOX functionality, is used for receiving emergency announcements or signals (such as a fire alarm). This input has absolute priority, and will overrule all inputs when an emergency announcement or signal is received.

Either a telephone line or a 100 V input signal can be connected to the Euro style pluggable screw terminal connector (13) at the rear of the unit. See section 4.1.5.1 and section 4.1.5.2.



#### Caution

Never connect telephone lines and a 100 V signal to the Euro style connector at the same time.

To adjust the volume of the emergency announcement or signal, turn the rotary dial (16) at the rear of the unit. For safety reasons, the volume of the emergency announcement or signal cannot be set to zero.

The master volume control setting (7) does not influence the volume setting of the emergency announcement or signal.



#### Note

Tel. emergency input does not mute the incoming signal so that an incoming pilot tone will be fed to the zone outputs. With this feature it is possible to use the mixer amplifier in a Bosch Voice Alarm System when using end of line boards (PLN-1EOL).

The signal that is delivered to the unit should be quiet when a call is not made. The pilot tone and frequencies below 300 Hz are filtered from the trigger signal so that the input will not trigger from a pilot tone or low frequency rumble.

#### 4.1.5.1 Connecting 100 Volt input signal

Connect the 100 Volt input signal as shown in figure 4.6.

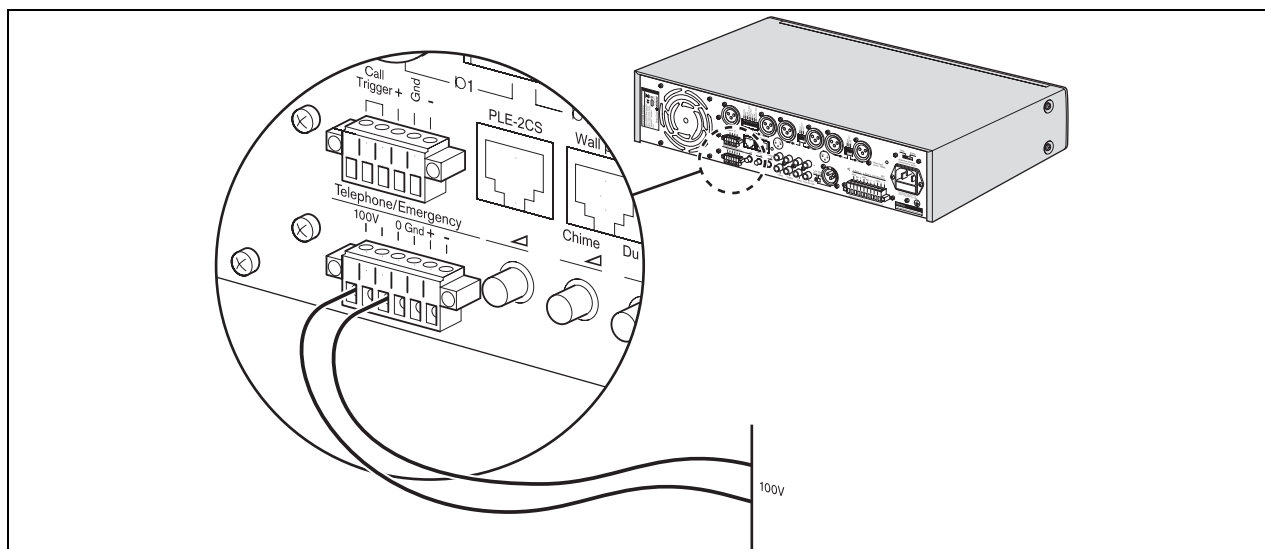


figure 4.6: Connecting 100 Volt input signal

#### 4.1.5.2 Connecting telephone lines

Connect the telephone lines as shown in figure 4.7.



##### Caution

A connection to a telephone network must always be made via a telephone coupler that provides adequate isolation between the telephone network (PBX) and the Plena system. The telephone coupler must also meet all relevant requirements for this type of communication equipment as imposed by law and/or responsible telecommunication organizations in the country of use. Never try to make a direct connection between the telephone network and the mixer amplifier.

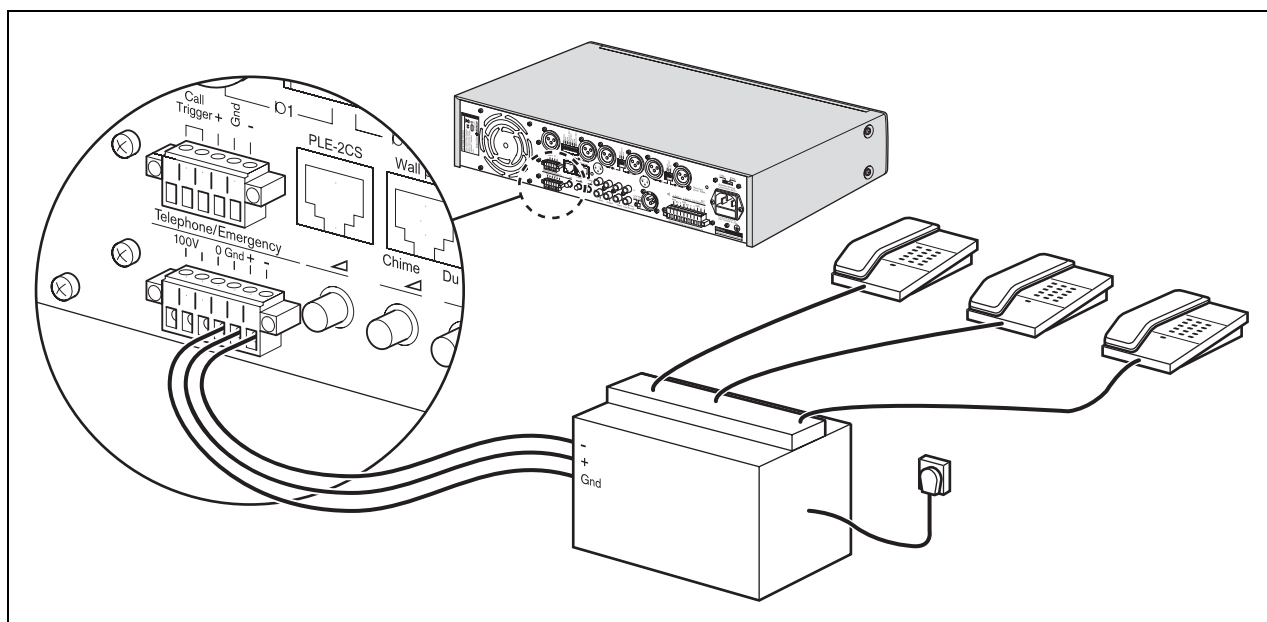


figure 4.7: Connecting emergency telephone lines

### 4.1.6 Music source inputs

When using a CD player, tuner or other auxiliary device for background music, connect the line-out connectors of the music source to the appropriate line-in connectors of the mixer amplifier.

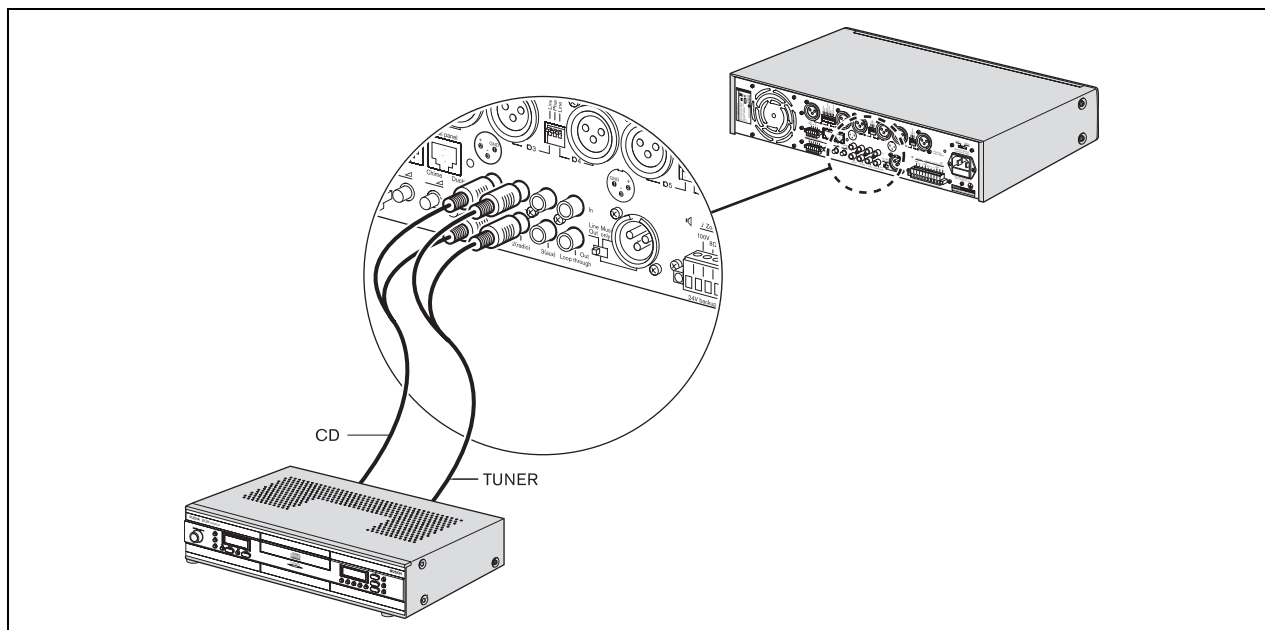


figure 4.8: Connecting music source inputs



## 4.2 Connecting outputs

### 4.2.1 Zone 1 and 2

Connect speakers to the 100 V or 8 Ohm terminal on the Euro style pluggable screw terminal connector (25) at the rear of the unit.

Also see section 4.2.5 “Connecting speakers”.

### 4.2.2 Call only

Connect speakers to the 100 V terminal on the Euro style pluggable screw terminal connector (25) at the rear of the unit.

Also see section 4.2.5 “Connecting speakers”.

### 4.2.3 Music only

Use the music master output connector (24) to provide a dedicated music out source for another device. For example, the music master output can be connected to a telephone coupler, so that callers can listen to music when they are put on hold (see figure 4.9).

To select the dedicated music out source, set the master switch for “line out or music only” (23) to “music only”. Only the music inputs (19, 20, and 21) will be audible. All other inputs, including the Tel. emergency/100V input will not be sent to this output.

To hear all mixed inputs (microphone/line, emergency, and music) set the master switch for “line out or music only” (23) to “line out”.

### 4.2.4 Line out/ loop through

Use the Pre-out, amp in insert (22) external sound processing equipment (e.g. an equalizer or Plena feedback suppressor) to be connected between the preamplifier and the power amplifier stages. See figure 4.9.

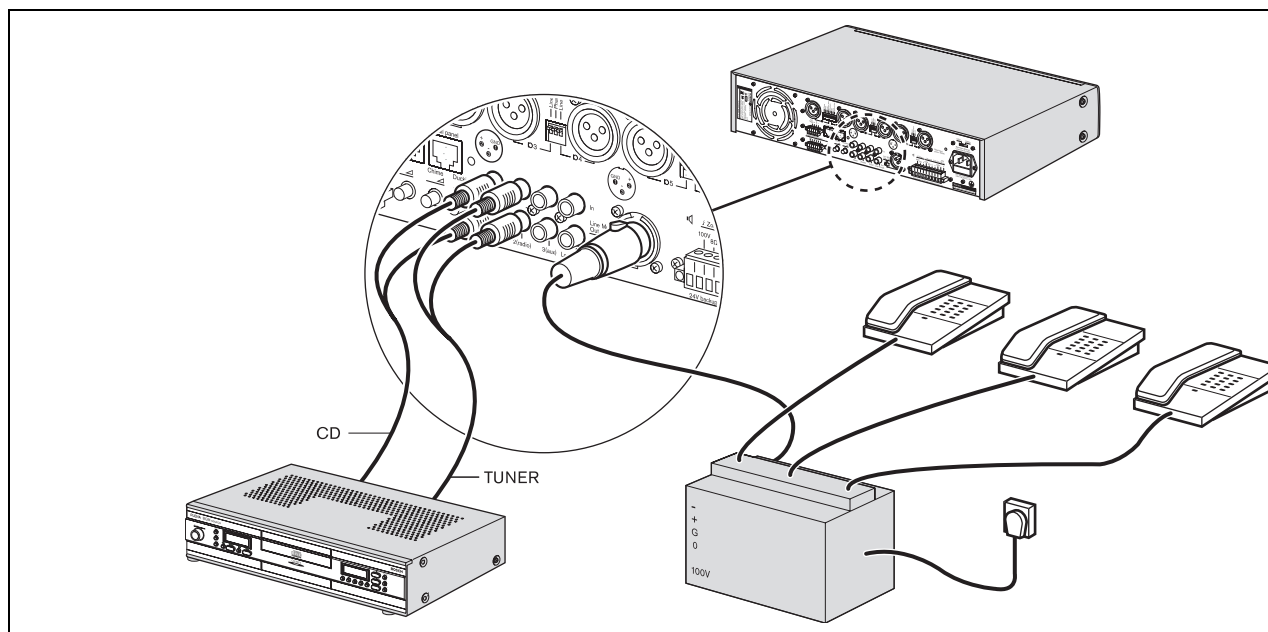


figure 4.9: Connecting music source inputs

## 4.2.5 Connecting speakers

### 4.2.5.1 Constant voltage loudspeakers

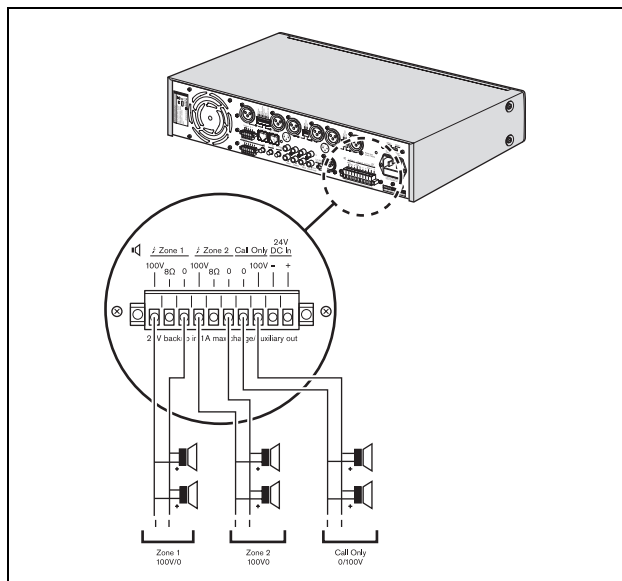


figure 4.10: Connecting speakers

The mixer amplifier can drive 100 V constant voltage loudspeakers.

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.

You can use the Call Only output for 3-wire remote volume control override. You can also use this output as an extra zone where announcements can be heard, but not music.

### 4.2.5.2 Low impedance loudspeakers

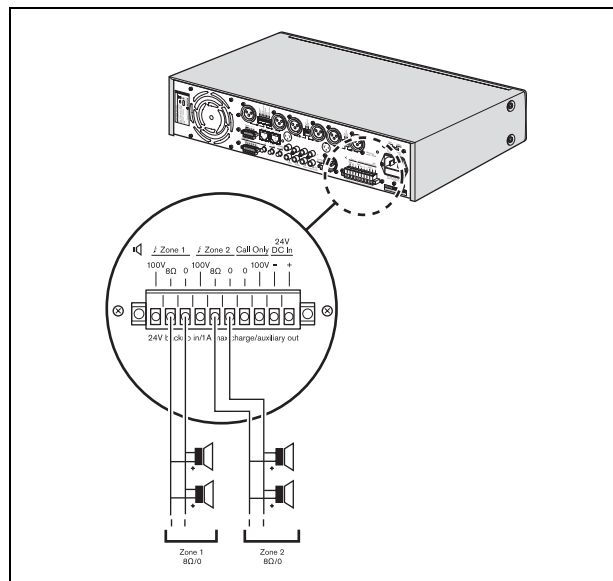


figure 4.11: Connecting speakers

Connect low impedance loudspeakers to the 8 Ohm/0 terminals. This output can deliver the rated output power into an 8 Ohm load. Connect multiple loudspeakers in a series/parallel-arrangement to make the combined impedance 8 Ohm or higher. Check the loudspeaker polarity for in-phase connection.

## 4.3 Unit settings

### 4.3.1 Rear panel settings

The unit can be quickly set-up for operation by setting the following controls at the rear of the unit:

- DIP switches
- Rotary dials
- Master switch for line out or music only.

See the following tables for an overview of the settings and typical examples of their use.

table 4.1: DIP switch settings

DIP switch	On	Off	Typical example (On)
Chime (mic/line 1)	Chime will be sounded at the beginning of an announcement.	Chime will not be sounded at the beginning of an announcement.	Announcement of train departure time.
PTT "Push to talk" (mic/line 1 only)	This input is muted when the push to talk contact is open. When the push to talk contact is closed: <ul style="list-style-type: none"> <li>• this input is available for speech.</li> <li>• a chime will sound, if selected.</li> <li>• the music and other mic/line inputs will be reduced in volume to the level set by the ducking level control knob.</li> </ul>	Push to talk off. The signal will be mixed with the other mic/line signals. Microphone 1 will mix with the background music or the other microphones in the selected zones.	Users can have private conversations during live broadcasts (for example, with an all call call-station, such as the PLE-1CS).
Line	Input signal from line.	Input signal from microphone.	Depends on set-up.
Speech filter	Enhances clarity of speech, by cutting-off the lower frequencies of the signal.	Speech filter inactive.	Use for announcements
Phantom power	Provides power to condenser microphones.	Phantom power unavailable.	Enable phantom power if you use electret or condenser microphones.
VOX (mic/line 2 only)	Temporarily suppresses the background music to an adjustable "ducking level" (see table 4.2) while you speak into the microphone. The VOX mode is normally used with hand-held microphones such as the LBC 2900/15. Background music and announcements will be heard in the selected zones. A chime is not available in this mode.	VOX inactive. Microphone 2 will mix with the background music or the other microphones in the selected zones.	Use to make casual announcements (such as announcing the winner of a competition) while temporarily suppressing the background music to an adjustable ducking level.

table 4.2: Rotary controls

Rotary control	Effect	Typical example
Ducking level control	Sets the required ducking level when VOX and/or push to talk is active (see table 4.1). When the ducking level is set to mute, the music volume will be fully attenuated; when the ducking level is set to mix, both music and speech inputs can be heard - music and speech will be mixed. When ducking the music input is ducked (attenuated), the microphone/line inputs are always muted when a call is made.	Set the ducking level control to mute if you want the announcement to be heard without background music.
Chime volume control	Alters the chime volume. The mid range is -8 dB (40 V), which should be sufficient for most applications. Test the chime by switching on microphone 1. Remove the microphone after testing if it is not further required.	Set the volume of the chime to a higher level when the system is being used in large open areas or when important announcements have to be made.
Telephone emergency/100V volume control	Attenuates the emergency announcement or signal. Control range from -25 dB to 0 dB. For safety reasons, the volume of the emergency announcement or signal cannot be fully set to zero.	Set the volume of the emergency announcement to a higher level when the system is being used in large open areas.

**Note**

When PTT or VOX are selected, the ducking control controls between 3 dB attenuation (very little ducking) to  $-\infty$  dB (muted).

When ducking, the music is also present on the Call only output. If you do not want this, set the ducking control to mute.

When ducking, music in a non-selected zone is also affected.

table 4.3: Master switch for line out or music only

Slide switch setting	Effect	Typical example
Line out	All mixed inputs (microphone/line, emergency, and music) are available.	Various set-ups are possible.
Music only	A dedicated music out source is available for another external device. Only the music inputs (19, 20, and 21) are available. All other inputs, including the Tel. emergency/100V input will be overridden.	The "music master output" can be connected to a telephone system, so that callers can listen to music when they are put on hold.

### 4.3.2 Pin settings and labelling

Users can create custom labels for the: microphone/line inputs, description of the music sources, and audio output zones 1 and 2. These labels can be attached to the mixer amplifier at position numbers 2, 4, and 6 (see figure 2.2). Colored pins can also be inserted at various positions around the dial controls to indicate the favorite settings for a particular application.

The pins are engineered in such a way that they cannot be taken out by hand. This is to prevent tampering. The pins are intended to be inserted once, during installation of the unit. The silver pins should be used to indicate the preferred settings of the unit. The red pins can optionally be used to indicate the maximum setting of a knob.

If these settings have to be changed, use a pair of soft-tipped pliers to carefully remove the pins. If you do not have a pair of soft-tipped pliers, you can use ordinary pliers instead, but first place some plastic tape on the tips of the pliers to prevent damaging the front of the unit.

To remove the clear plastic covers in front of the labels:

- 1 Carefully insert a small screwdriver into the cut-out at the bottom of the plastic cover.
- 2 Gently lift the cover, and bend it in the middle. Take care not to force the cover or the front panel.

To reattach the plastic covers with paper labels:

- 1 Insert the paper label into the holder at the front of the unit.
- 2 Pick up the cover, and then bend it slightly in the middle by hand.
- 3 Fit the cover into the slot at the front of the unit, and then gently release the cover, making sure that the paper label stays in place.

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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 voltage selector at the rear of the unit.

- 1 Make sure the voltage selector (115V/ 230V) 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 (see figure 5.2).

#### 5.1.2 Switch off

Set the power button (1) on the front of the unit to Off - popped out (see figure 5.2).

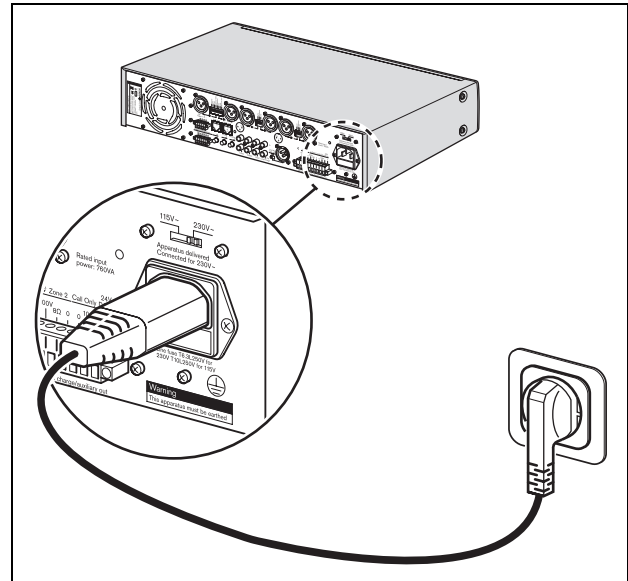


figure 5.1: Voltage selector

## 5.2 Microphone/line controls

Use the volume controls (9) to individually control the sound level of microphone/line inputs 1 through 6.



### Note

Users can create custom labels for the: microphone/line inputs, description of the music sources, and audio output zones 1 and 2. These labels can be attached to the mixer amplifier at position numbers 2, 4, and 6 (see figure 5.2). Colored pins can also be inserted at various positions around the dial controls to indicate the favorite settings for a particular application.

## 5.3 Music controls

### 5.3.1 Source selection

Use the music source selector (11) to select one of the connected music sources.

### 5.3.2 Volume control

Use the music source volume control (12) to control the sound level of the selected music source.

## 5.4 Tone control

### 5.4.1 Introduction

The unique tone controls provide separate control for mic/line inputs and music inputs so that the voice on the microphones can be specifically optimized for excellent speech or singing. Correspondingly, the tone controls for background music provide the most appropriate music reproduction.

The tone controls are not standard bass and treble controls: they can be used as a traditional tone control with high and low control, but also have a powerful contour that addresses problems found in real situations.

### 5.4.2 Microphone/line tone control

The tone control for the microphone and line inputs boosts warmth in voices without boosting rumble, and cuts rumble without losing warmth in the low frequencies. In the high frequencies, the tone control boosts sparkle without adding sharpness, but when cutting is first, cuts harshness and sharpness without reducing clarity.

Use the Hi (high) and Lo (low) tone controls (see figure 5.2, numbers 3 and 10) to collectively change the tone of microphone/line inputs 1 through 6.

### 5.4.3 Music tone control

The tone control for the music inputs boosts deep bass first without making the sound boomy, and cuts rumble without losing warmth in the low frequencies. In the high frequencies, the tone control is similar to the microphone inputs, with slightly different frequencies to suit music reproduction.

Use the Hi (high) and Lo (low) tone controls (see figure 5.2, numbers 5 and 13) to change the tone of the selected music source.

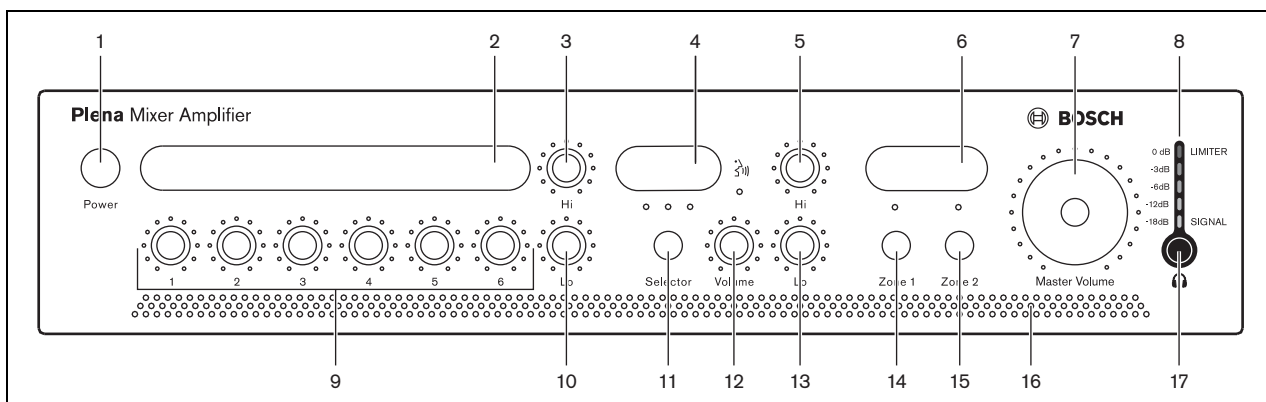


figure 5.2: Front panel



## 5.5 Output controls

### 5.5.1 Zone selection

Use the zone selection buttons (14 and 15) to route the music/microphone, line mix from the amplifier output to loudspeaker zone 1 and/or loudspeaker zone 2.

Announcements, however, are always routed to both zones, irrespective of the position of the zone selection buttons.

### 5.5.2 Master volume control

Use the master volume control dial (7) to collectively control the sound level of all outputs, except the emergency announcement/signal.

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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-2MA120-EU**

8/16 A (230/115 VAC)

**Inrush Current PLE-2MA240-EU**

9/19 A (230/115 VAC)

#### 6.1.2 Battery power supply

**Voltage**

24 VDC,  $\pm 15\%$

**Current PLE-2MA120-EU**

6 A

**Current PLE-2MA240-EU**

12 A

**Charge current**

0.5 ADC

**Charge float voltage**

27.4 VDC

#### 6.1.3 Power consumption

**PLE-2MA120-EU (mains)**

400 VA

**PLE-2MA240-EU (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

**Low Control**

Max -12/+12 dB (frequency is level dependent)

**Hi Control**

Max -12/+12 dB (frequency is level dependent)

#### 6.1.5 RJ-45 input 2 x

**Call station input**

For PLE-2CS(MM)

**Wall panel input**

For PLE-WP3S2Z

#### 6.1.6 Mic/line input 6 x

**Input 1 (Push-to-talk contact with ducking functionality)**

5-pin Euro style, balanced, phantom

3-pin XLR, balanced, phantom

**Input 2-6 (VOX with ducking functionality on input 2)**

3-pin XLR, balanced, phantom

**Sensitivity**

1 mV (mic); 200 mV (line)

**Impedance**

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

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

63 dB

**S/N (flat at min volume/muted)**

>5 dB

**Dynamic range**

100 dB

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

>63 dB (mic); >70 dB (line)

**S/N (flat at min volume/muted)**

>75 dB

**CMRR**

>40 dB (50 Hz to 20 kHz)

**Headroom**

>25 dB

**Speech filter**

-3 dB @ 315 Hz, high-pass, 6 dB/oct

**Phantom power supply**

16 V via 1.2 kohm (mic)

**Speech filter**

-3 dB @ 315 Hz, high-pass,

6 dB/oct

**VOX (input 1 & 2)**

attack time 150 ms; release time 2 s

### 6.1.7 Music inputs 3x

<b>Connector</b>	Cinch, stereo converted to mono
<b>Sensitivity</b>	200 mV
<b>Impedance</b>	22 kohm
<b>S/N (flat at max volume)</b>	>70 dB
<b>S/N (flat at min volume/muted)</b>	>75 dB
<b>Headroom</b>	>25 dB

### 6.1.8 Emergency / telephone 1 x

<b>Connector</b>	7-pin, Euro style pluggable screw terminal
<b>Sensitivity tel</b>	100 mV – 1 V adjustable
<b>Sensitivity 100V</b>	10 V – 100 V adjustable
<b>Impedance</b>	>10 kohm
<b>S/N (flat at max volume)</b>	>65 dB
<b>VOX</b>	threshold 50 mV; attack time 150 ms; release time 2 s

### 6.1.9 Loop through insert 1 x

<b>Connector</b>	Cinch
<b>Nominal level</b>	1 V
<b>Impedance</b>	>10 kohm

### 6.1.10 Master/music output 1 x

<b>Connector</b>	3-pin XLR, balanced
<b>Nominal level</b>	1 V
<b>Impedance</b>	<100 ohm

### 6.1.11 Loudspeaker outputs 100 V\*

<b>Connector</b>	Screw, floating
<b>Max / rated PLE-2MA120-EU</b>	180 W / 120 W
<b>Max / rated PLE-1906/10</b>	360 W / 240 W

### 6.1.12 Loudspeaker output 8 ohm\*

<b>Connector</b>	Euro style pluggable screw terminal, floating
<b>PLE-2MA120-EU</b>	31 V (120 W)
<b>PLE-2MA240-EU</b>	44 V (240 W)
* Subtract 1 dB for 24 V battery operation.	

## 6.2 Mechanical

<b>Dimensions (H x W x D)</b>	100 x 430 x 270 mm (19" wide, 2U high)
<b>Mounting</b>	Stand-alone, 19" rack
<b>Color</b>	Charcoal
<b>Weight (PLE-2MA120-EU)</b>	Approx. 10.5 kg
<b>Weight (PLE-2MA240-EU)</b>	Approx. 12.5 kg

## 6.3 Environmental

<b>Operating temperature</b>	-10 to +55 °C
<b>Storage temperature</b>	-40 to +70 °C
<b>Relative humidity</b>	<95%
<b>Acoustic noise level of fan</b>	<33 dB SPL @ 1 m temperature control



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Data subject to change without notice

2007-10 | PLE-2MA120-EU, PLE-2MA240-EU en

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