Plena Mixer Amplifier

PLE-1MExx0-xx

BOSCH

en Installation and Operation manual

Table of Contents

1   Safety

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.

Alerts on the appliance:

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 foundin 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 separatecollection facility for electronic waste and not disposed with household waste.

–   Read instructions - All the safety instructions for use should be read before the system is operated.
–   Retain instructions - The safety instructions and operating instructions should be retained for future reference.
–   Heed warnings - All warnings on the unit and in the operating instructions should be adhered to.
–   Follow instructions - All operating instructions and instructions for use should be followed.
–   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.
–   Attachments - Do not use attachments not recommended by the product manufacturer as they may cause hazards.
–   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.
–   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.

– 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.

– Heat sources - Do not install the unit near any heat sources such as radiators, stoves, or other apparatus that produce heat (including amplifiers).

– Open flames - No open flames, such as lighted candles, should be placed on the unit.

– 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".

– 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.

– 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.

– Overloading - Do not overload outlets and extension cords as this can result in a risk of fire or electrical shock.

– 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.

– 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.

– 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.

– 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.

– 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.

– 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.

– 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.

– 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.

NOTICE!

American users:

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.

NOTICE!

Canadian users:

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.

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2 Short Information

2.1 Purpose

The purpose of this manual is to provide information required for installing, configuring and operating a Plena Mixer Amplifier.

2.2 Digital document

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

2.3 Intended audience

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

2.4 Related documentation

The following related documents are available:
– Safety Instructions (9922 141 1036x)

2.5 Alerts and notice signs

Three 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:

⚠	**CAUTION!** The equipment or the property can be damaged, or persons can be lightly injured if the alert is not observed.
⚠	**WARNING!** The equipment or the property can be seriously damaged, or persons can be severely injured if the alert is not observed.
⚡	**DANGER!** Not observing the alert will lead to death or sever injuries.
ⓘ	**NOTICE!** Alert containing additional information. Usually, not observing a 'notice' does not result in damage to the equipment or personal injuries.

2.6   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.

Imperial	Metric	Metric	Imperial
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 2.1   Conversion of units of length

Imperial	Metric	Metric	Imperial
1 lb =	0.4536 kg	1 kg =	2.2046 lb

Table 2.2   Conversion of units of mass

Imperial	Metric	Metric	Imperial
1 psi =	68.95 hPa	1 hPa =	0.0145 psi

Table 2.3   Conversion of units of pressure

NOTICE!

1 hPa = 1mbar.

Fahrenheit	Celsius
°F = 9/5 (°C + 32)	°C = 5/9 (°F - 32)

Table 2.4   Conversion of units of temperature

3   System Overview

3.1   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.

3.2   Contents of box

The packaging box contains the following contents:
–   PLE-1MExx0-xx
–   Labels and colored pins for indicating favorite settings
–   Power cord
–   Plena Bonus CD

NOTICE!
The PLE-1MExx0-EU has a 100 V loudspeaker output and PLE-1MExx0-US has a 70 V loudspeaker output.

3.3   The Plena Mixer Amplifier

The Plena Mixer Amplifier is a high performance, professional public address unit for mixing up to four separate microphone/line signals, and one music signal.

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 priority, labeling, 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 channel 1 can take priority over all other microphone and music input:
–   Input 1 can be activated by contact closure on a PTT (push to talk). A chime can be configured to precede an announcement.

Users can create a custom label for inputs and music sources. The label can be attached to the special holder 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.

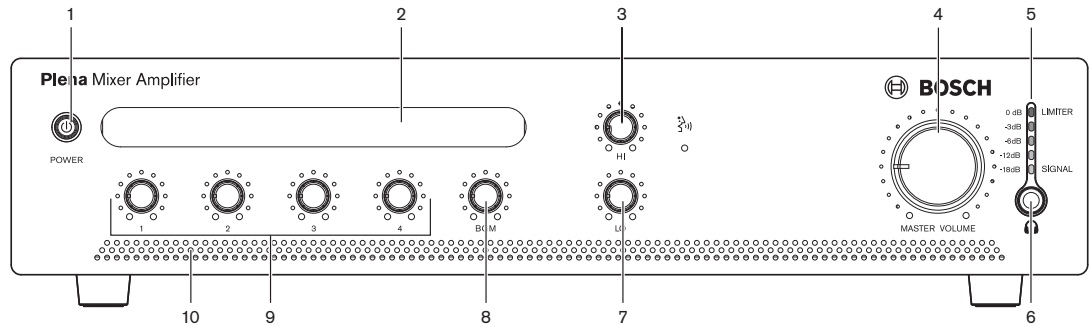## 3.4   Controls, connectors and indicators

3.4.1   Front panel

Figure 3.1   Front panel

Number	Description
1	Power button
2	Label holder for user-defined description of microphone/line inputs - custom labels can be created by user
3	High tone control
4	Master volume control
5	Output level meter (-18 db, 0 db)
6	Headphone socket
7	Low tone control
8	Music source volume control (input 5)
9	Input level control – microphone/line 1 – microphone/line 2 – microphone/line 3 – microphone/line 4
10	Air inlet holes

NOTICE!
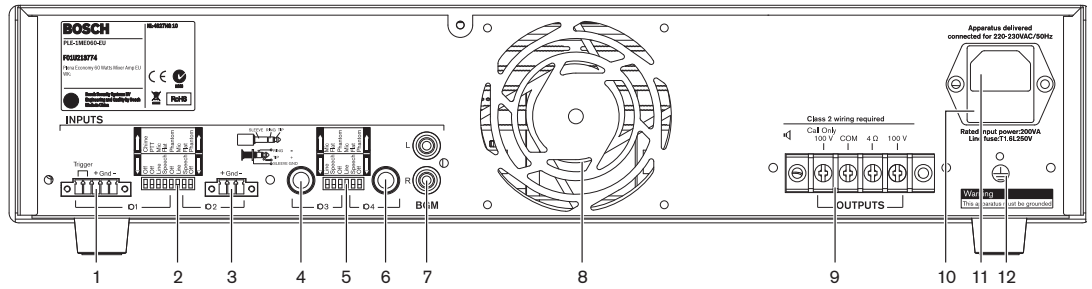Do not obstruct the airflow into the unit.

3.4.2 Back panel

Figure 3.2 Back panel

Number	Description
1	Microphone/line 1 input with trigger, Euro style screw terminal connector - DIP switch settings for: chime, PTT (push to talk), mic./line, speech filter, and phantom power (see number 2)
2	DIP switch for microphone/line 1 and microphone/line 2 (see numbers 1 and 3 respectively)
3	Microphone/line 2 input, Euro style screw terminal - DIP switch settings for speech filter, mic./line, and phantom power (see number 2)
4	Microphone/line 3 input, 6.3 mm - 1/4" jack connector - DIP switch settings for mic./line, and phantom power (see number 5)
5	DIP switch for microphone/line 3 and microphone/line 4 (see numbers 4 and 6 respectively)
6	Microphone/line 4 input, 6.3 mm - 1/4" jack connector - DIP switch settings for mic./line, and phantom power (see number 5)
7	Music input, 2x RCA/cinch connectors, Stereo, summed mono
8	Cooling fan (PLE-1ME120 & PLE-1ME240)
9	Outputs: – Call only, screw terminal connector 100 V – Screw terminal connector 100 V, and 4 Ohm
10	Mains fuse
11	Earth connection screw
12	Mains connector (3-pole)

> **NOTICE!**
> The unit must be earthed.
> Always allow adequate space at the rear of the unit for ventilation.

4 Planning

Calculate your total power needs based on the sum of the power handling capacity and tapping of all loudspeakers planned in your system. When you use the volume controls, assume the maximal setting for this calculation.

Make sure that the unit has sufficient air around it for ventilation. For units with a fan, make sure that the cabinet where the unit is placed in can evict air from the rear. For units without a fan, leave room on top of the unit for convection. Units with a fan do not need free space directly above the housing. Take at least 10 cm into account for connectors and wiring. Make sure that no liquids can spill into or on the unit and that the air intake holes are not obstructed. Make sure that there is a power outlet of sufficient rating close to the intended location.

5   Installation

5.1   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.

5.2   Check settings/connections

1. Connect any additional equipment (see *Section 6.1 Connecting inputs* and *Section 6.2 Connecting outputs*).
2. Check the settings (see *Section 7.1 Unit settings*).

5.3   Connect unit to mains

⚠ **CAUTION!**
Before connecting power, always check the voltage indicator plate at the rear of the unit.

1. Make sure the power switch on the front of the unit is set to Off.
2. Connect the power cord to the mains connector and plug it into the mains outlet.
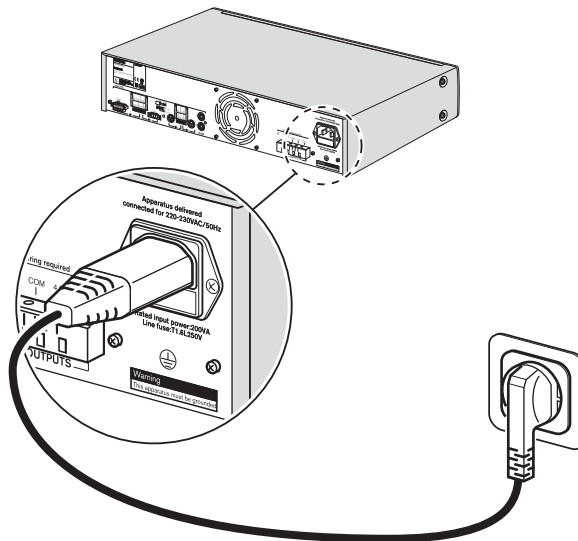

**Figure 5.1**   Power connection and voltage selector

6 Connection

6.1 Connecting inputs

6.1.1 Priority microphone (input 1)

The priority microphone PLE-1CS or PLE-1SCS (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 (2) at the rear of the unit. Microphone/line 1 input has priority over all other microphone/line inputs.

The microphone/line 1 input has a Euro style screw terminal connector.

The Euro style screw terminal connector has a trigger input, which can be used in combination with the Euro and XLR connector.
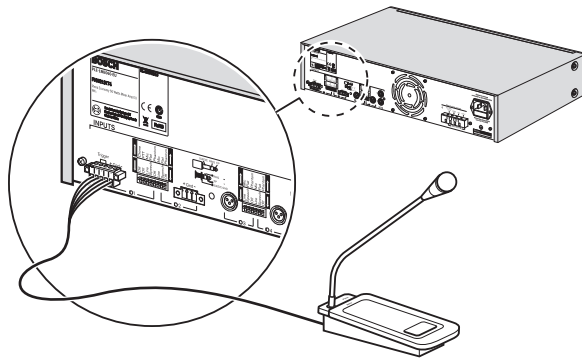
Figure 6.1 Euro connector with trigger

6.1.2 Secondary microphone (input 2)

Connect a secondary microphone to "microphone/line input 2".

Set the DIP switch settings next to the connector as required. See *Section 7.1 Unit settings*.

6.1.3 Additional microphones (inputs 3 and 4)

Connect additional microphones to microphone/line inputs 3 and 4 as required. See *Figure 6.2*. These microphones will mix with the background music.

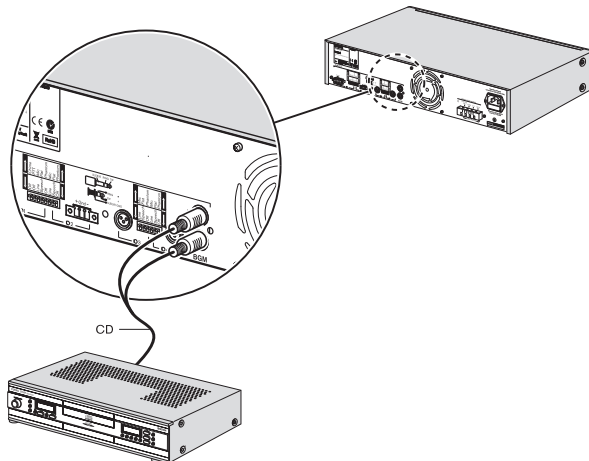Set the DIP switch settings between connector for microphone/lines 3 and 4, as required. See *Section 7.1 Unit settings*.
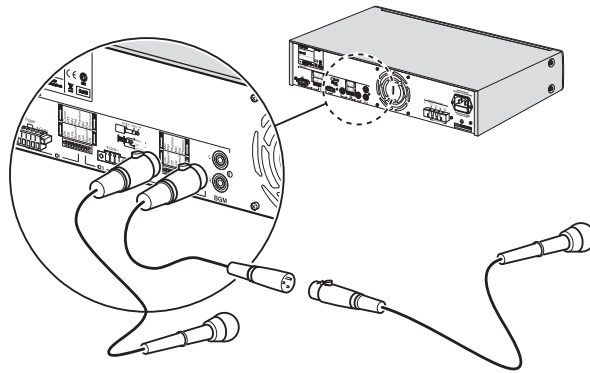
Figure 6.2 Connecting microphone inputs

6.1.4 Music source input

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

Figure 6.3 Connecting music source inputs

6.2   Connecting outputs

6.2.1   Main output

Connect speakers to the 100 V, 70 V or 4 Ohm terminal on the Euro style screw terminal connector (9) at the rear of the unit.
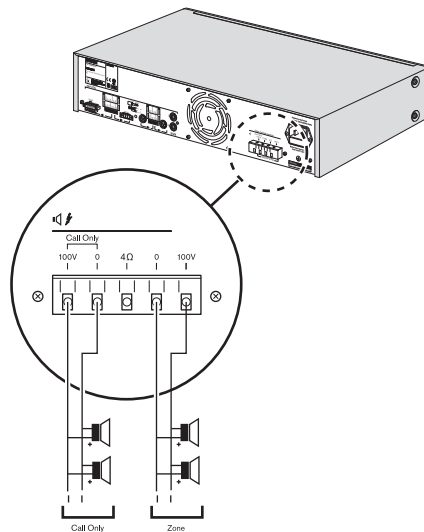
Also see *Section 6.2.3 Connecting constant voltage loudspeakers* and *Section 6.2.4 Connecting low impedance loudspeakers*.

6.2.2   Call only

Connect speakers to the 100 V terminal on the Euro style screw terminal connector (9) at the rear of the unit.

Also see *Section 6.2.3 Connecting constant voltage loudspeakers* and *Section 6.2.4 Connecting low impedance loudspeakers*.

6.2.3   Connecting constant voltage loudspeakers

Figure 6.4   Connecting constant voltage loudspeakers

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.

6.2.4   Connecting low impedance loudspeakers
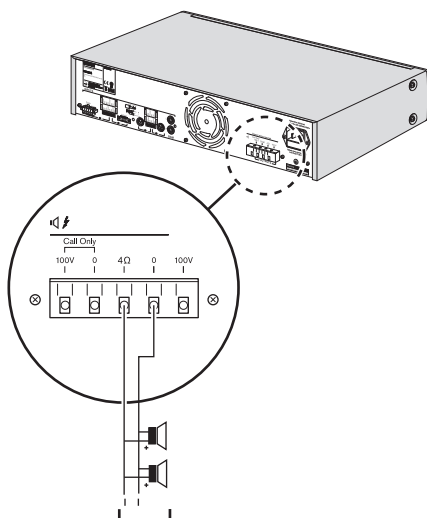
Figure 6.5   Connecting low impedance loudspeakers

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.

7   Configuration

7.1   Unit settings

7.1.1   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

7.1.2   Pin settings and labeling

Users can create custom labels for the: microphone/line inputs, description of the music source. These labels can be attached to the mixer amplifier at position number 2 (see *Figure 3.1*). 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.

8   Operation

8.1   Switch on and off
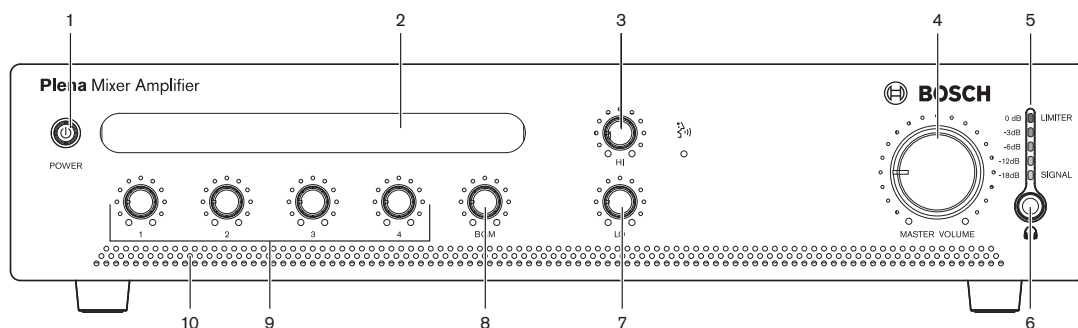
8.1.1   Switch on

⚠ **CAUTION!**
Before applying power, always check the voltage indicator plate at the rear of the unit.

1.   Set the power button (1) on the front of the unit to On - pushed in (see *Figure 8.1*).

8.1.2   Switch off
1.   Set the power button (1) on the front of the unit to Off - popped out (see *Figure 8.1*).

Figure 8.1   Front panel

8.2   Microphone/line controls

Use the volume controls (9) to individually control the sound level of microphone/line inputs 1 through 4.

8.3   Music controls

8.3.1   Volume control
Use the music source volume control (8) to control the sound level of the selected music source.

8.3.2   Tone control
The tone controls are not standard bass and treble controls: they can be used as a traditional tone control with high and low control.

The tone control for the low frequencies boosts deep bass first without making the sound boomy, and cuts rumble without loosing warmth in the low frequencies.

Use the Hi (high) and Lo (low) tone controls (see *Figure 8.1*, numbers 3 and 7) to change the tone.

8.4   Output controls

8.4.1   Master volume control
Use the master volume control dial (4) to collectively control the sound level of all outputs, except the emergency announcement/signal.

9   Maintenance

The mixer amplifier has been designed to function without problems for a long time with a minimum of maintenance.

In order to guarantee trouble-free operation, clean the unit with a damp lint free cloth, especially the air intake holes on the front. Have a technician clean the dust from the fan and the inside at regular intervals for the models that have a fan. Base the interval on the actual situation and dust build up, start with an interval of at least once per year. Periodically check the connectors for corrosion and check the screw terminals to make sure that they have not become loosened.

10 Technical Data

10.1 Electrical

10.1.1 Mains power supply

Voltage PLE-1MEXX0-EU:	230 VAC, ±10%, 50/60 Hz (reduced power at lower mains)
Voltage PLE-1MEXX0-US:	120 VAC, ±10%, 50/60 Hz (reduced power at lower mains)
Inrush Current PLE-1ME060-EU:	5 A
Inrush Current PLE-1ME060-US:	10 A
Inrush Current PLE-1ME120-EU:	10 A
Inrush Current PLE-1ME120-US:	20 A
Inrush Current PLE-1ME240-EU:	12 A
Inrush Current PLE-1ME240-US:	24 A

10.1.2 Power consumption

PLE-1ME060-XX:	200 VA
PLE-1ME120-XX:	400 VA
PLE-1ME240-XX:	800 VA

10.1.3 Performance

Frequency response:	Line 60 Hz to 20 kHz (+1/-3 dB @ 10 dB ref. rated output)
	Mic. 70 Hz to 20 kHz (+1/-3 dB @ 10 dB ref. rated output)
Distortion:	<1% @ rated output power, 1 kHz
Bass control:	Max. -10/+10 dB
Treble control:	Max. -10/+10 dB

10.1.4 Mic./Line input 4 x

Input 1 (Push-to-talk contact with priority):	5-pin Euro style, balanced, phantom
Input 2:	3-pin Euro style, balanced, phantom
Input 3 & 4:	TRS Jack (1/4, 6.3 mm), balanced
Sensitivity:	1 mV (mic); 300 mV (line)
Impedance:	>1 kOhm (mic); >5 kOhm (line)
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)

10.1.5 Music input

Connector:	Cinch, stereo converted to mono
Sensitivity:	200 mV
Impedance:	22 kOhm
S/N (flat at max. volume):	>75 dB
S/N (flat at min. volume/muted):	>80 dB
Headroom:	>25 dB

10.1.6 Loudspeaker output 100 V / 70 V

Connector:	Screw terminal, floating
Max. / rated PLE-1ME060-XX:	90 W / 60 W
Max. / rated PLE-1ME120-XX:	180 W / 120 W
Max. / rated PLE-1ME240-XX:	360 W / 240 W

10.1.7 Loudspeaker output 4 Ohm

Connector:	Screw terminal, floating
Max. / rated PLE-1ME060-XX:	15.5 V (60 W)
Max. / rated PLE-1ME120-XX:	22 V (120 W)
Max. / rated PLE-1ME240-XX:	31 V (240 W)

10.2 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-1ME060-EU):	Approx. 6.5 kg
Weight (PLE-1ME120-EU):	Approx. 8.9 kg
Weight (PLE-1ME240-EU):	Approx. 10.5 kg

10.3 Environmental

Operating temperature:	-10 °C to +45 °C
Storage temperature:	-40 °C to +70 °C
Relative humidity:	<95%
Acoustic noise level of fan (PLE-1ME240-EU):	<33 dB SPL @ 1 m

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