

Plena Booster Amplifier



Security Systems

en | Installation and Operating Manual
LBB 1930, LBB 1935,
LBB 1938

BOSCH

Important safeguards

- 1 Read instructions - All the safety instructions for use should be read before the system is operated.
- 2 Retain instructions - The safety instructions and instructions for use 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 a damp 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.
- 10 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".
- 11 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 plug.
- 12 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.
- 13 Overloading - Do not overload outlets and extension cords as this can result in a risk of fire or electrical shock.
- 14 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.
- 15 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.
- 16 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.
- 17 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.
- 18 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.
- 19 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.

About this manual

This manual provides all the information required to install and operate the unit.

Conventions

**Warning**

Follow these instructions to prevent personal injury.

**Caution**

Follow these instructions to prevent damage to the equipment.

**Note**

Read these instructions for tips and other useful information.

Safety precautions

**Warning**

Do not open the unit when it is connected to the mains. The unit contains non-insulated parts, which can cause electric shock.

**Caution**

There are no user-serviceable parts inside the unit. Service must be done by qualified personnel.

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1 About the equipment

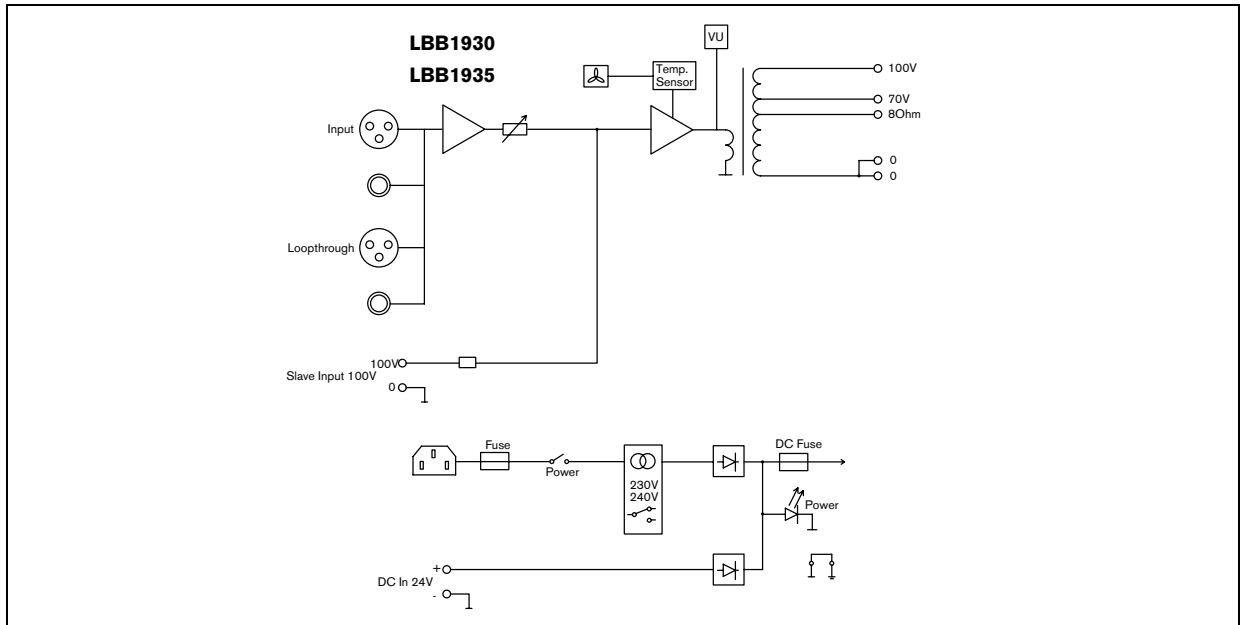


Figure 1.1

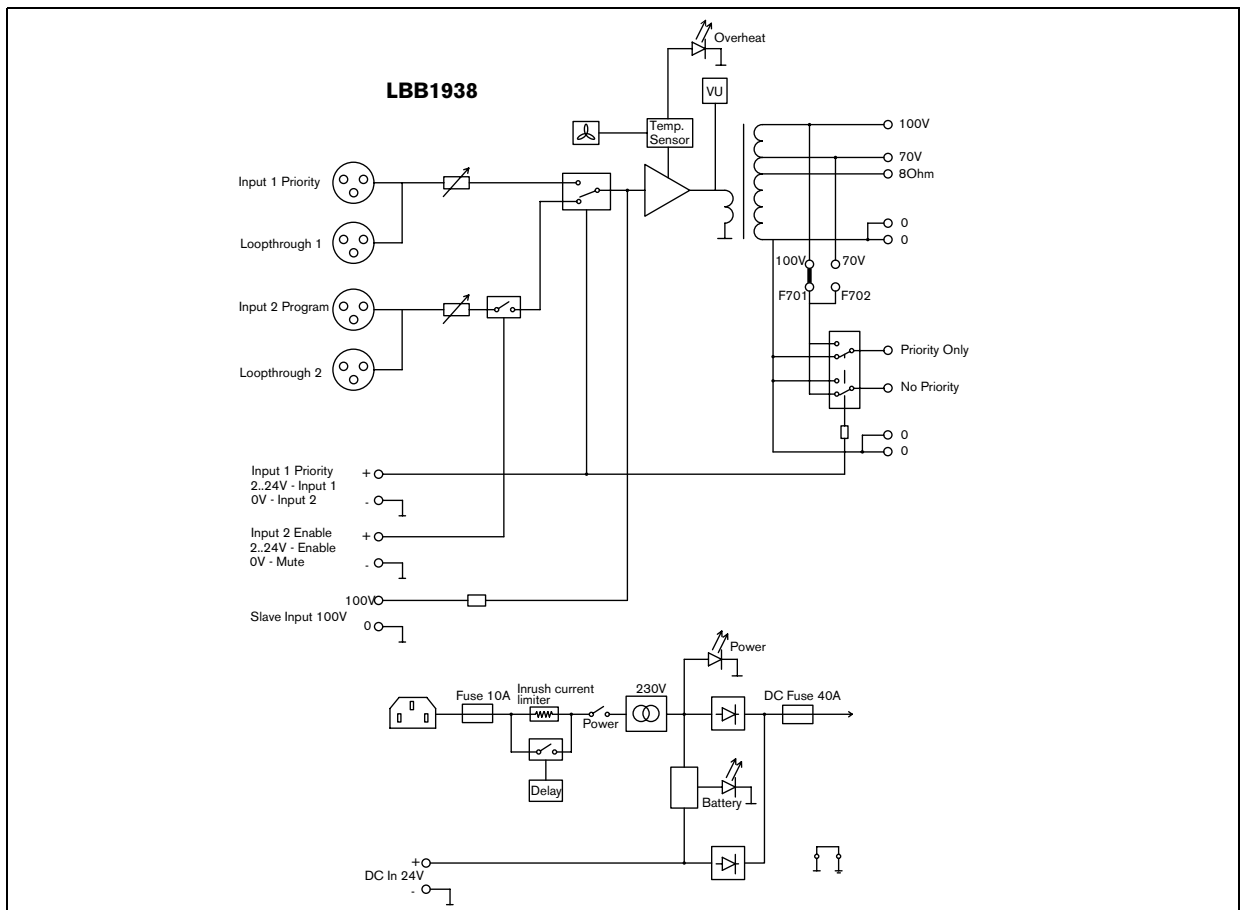


Figure 1.2

The Plena Booster Amplifier range consists of three mono amplifiers with output powers of 120 W (LBB1930), 240 W (LBB1935) or 480 W (LBB1938). These booster amplifiers have 70 V and 100 V constant voltage outputs and a low impedance output for 8 Ohm loudspeakers. The amplifiers are protected against overload and short circuits. Built-in features like a temperature controlled fan and an overheat protection ensure high reliability. Battery operation with automatic switchover from the mains supply is possible. The line inputs are balanced and have a loopthrough facility; a 100 V slave input allows for connection to existing loudspeaker lines. The LBB1938 has double inputs with a priority function and priority controlled outputs.

1.1 Controls and indicators (front)

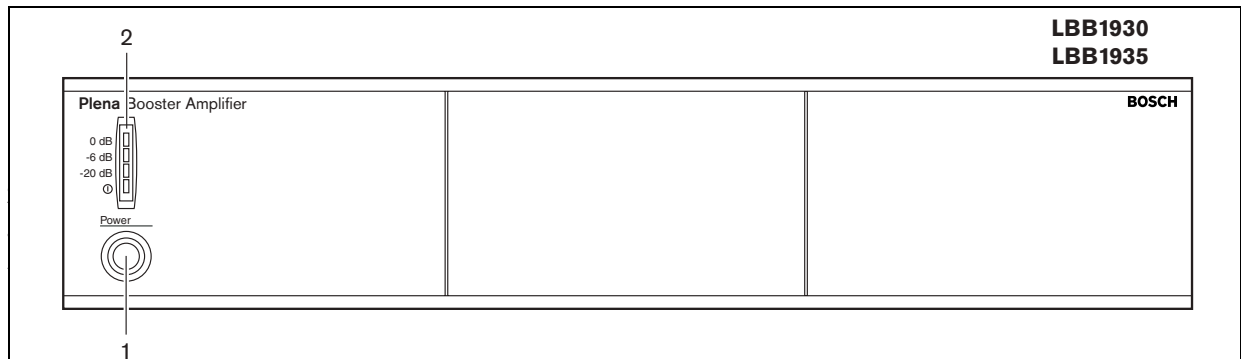


Figure 1.3

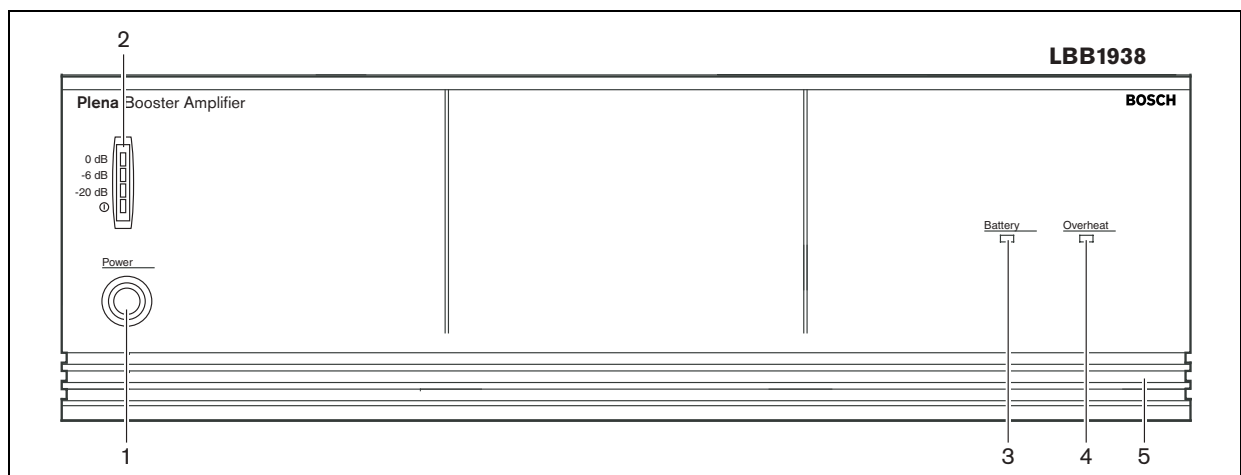


Figure 1.4

- 1 Power button
- 2 VU-meter (LED's for -20, -6, 0 dB and Power ON)
- 3 Battery operation indicator (only for LBB1938)
- 4 Overheat indicator (only for LBB1938)
- 5 Air inlet for forced air cooling (only for LBB1938)

1.2 Controls and connections (LBB1930, LBB1935 - rear)

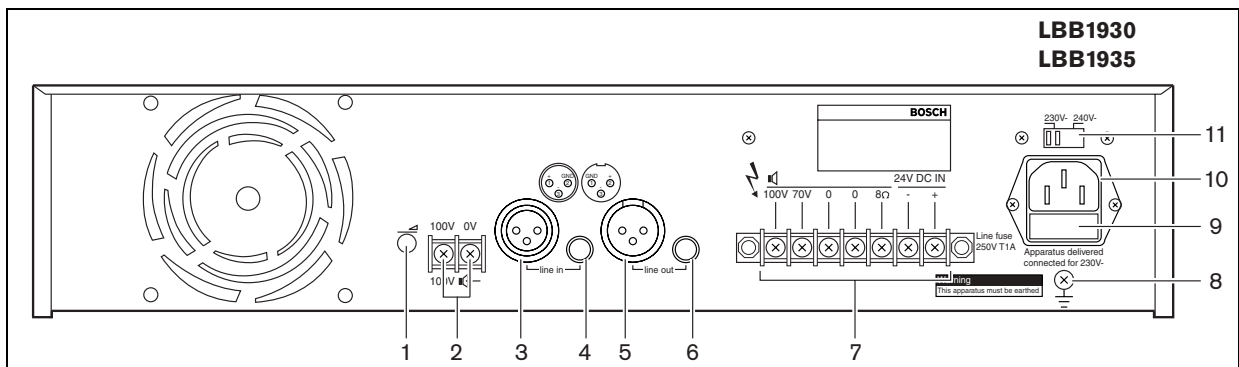


Figure 1.5

- | | |
|--|-----------------------------------|
| 1 Level control | 8 Earth connection screw |
| 2 100 V / 0 V slave input terminal | 9 Mains fuse |
| 3 Line input (XLR/balanced) | LBB1930 T2.5A |
| 4 Line input (phone jack/balanced) | LBB1935 T4A |
| 5 Line loophrough (XLR/balanced) | 10 Mains connector (3-pole) |
| 6 Line loophrough (phone jack/balanced) | 11 Mains voltage switch 230/240 V |
| 7 Loudspeaker output terminals and 24 Vdc power supply terminals | |

1.3 Controls and connections (LBB1938 - rear)

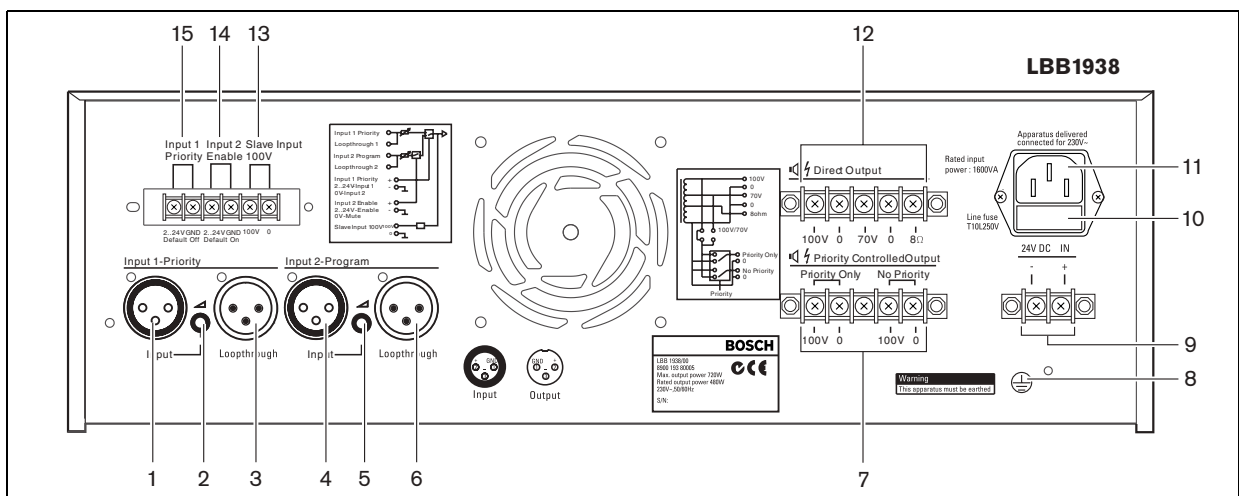


Figure 1.6

- | | |
|--|--|
| 1 Priority line - input 1 (XLR/balanced) | 9 24 Vdc power supply terminals |
| 2 Level control - input 1 | 10 Mains fuse (T10A) |
| 3 Line loophrough 1 (XLR/balanced) | 11 Mains connector (3-pole) |
| 4 Program line - input 2 (XLR/balanced) | 12 Loudspeaker direct output terminals |
| 5 Level control - input 2 | 13 100 V slave input terminals |
| 6 Line loophrough 2 (XLR/balanced) | 14 Input 2 enable control terminals |
| 7 Priority controlled loudspeaker output terminals | 15 Input 1 priority control terminals |
| 8 Earth connection screw | |

2 Internal setting (LBB1938 only)

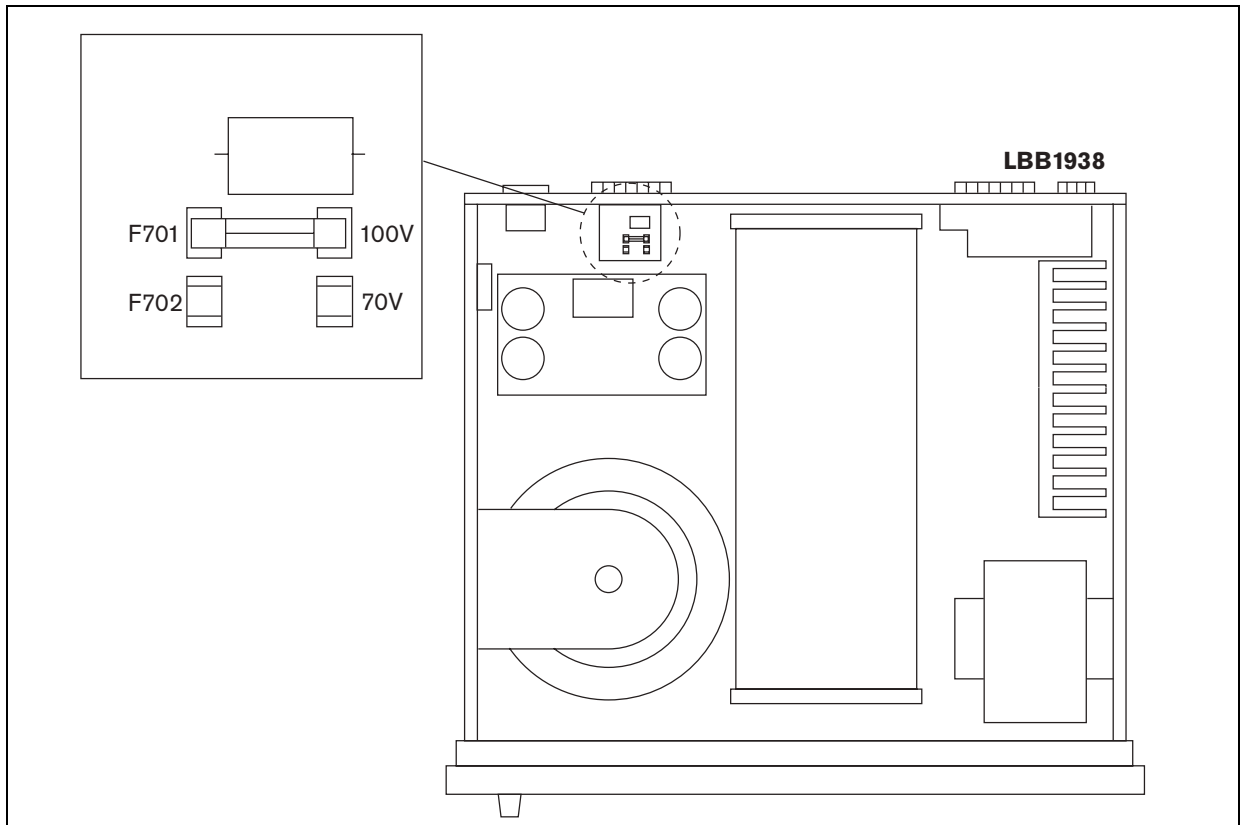


Figure 2.1

The output voltage of the priority controlled loudspeaker outputs can be set to 70 V or 100 V. To this end, a high power fuse inside the unit is used as a voltage selector.

Insert the high power fuse into fuse holder F701 for 100 V selection (default setting), or into fuse holder F702 for 70 V selection. This selection does not affect the output voltage of the loudspeaker direct outputs.



Caution

Never insert two fuses into F701 and F702 simultaneously.

3 Installation in rack

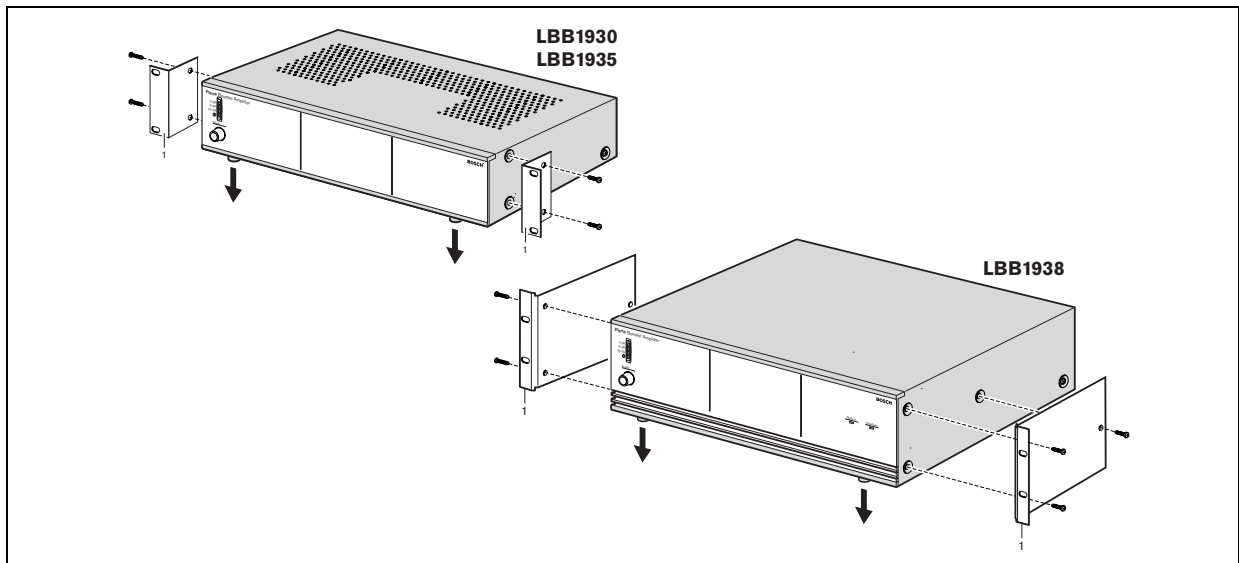


Figure 3.1

The booster amplifier is delivered for tabletop use, but you can mount it in a 19" rack using the brackets supplied with the unit. In case of rack mounting, you must:

- remove the 4 feet from the bottom of the unit. Without the feet, the LBB1930 and LBB1935 are 2U high and the LBB1938 is 3U high.
- leave 1U empty rack space above the LBB1930 or LBB1935 to ensure sufficient air flow.
- ensure that the ambient temperature of the unit in the rack does not exceed 55 °C.

In case of rack mounting, removal of the top cover of a booster amplifier is allowed to improve the ventilation. In such a case, always use the shimming washers that come with the brackets and make sure to comply with the safety instructions. The amplifier has a built-in temperature controlled fan for reliable operation at high output power for a prolonged time. If the internal temperature reaches a critical limit due to insufficient air flow, overload or an excessive ambient temperature, the overheat protection will be activated, causing the amplifier to switch to standby mode.

4 External settings and connections

4.1 Connect the DC supply (battery)

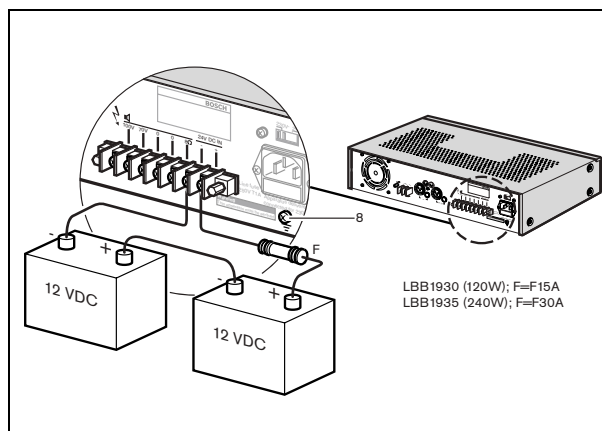


Figure 4.1

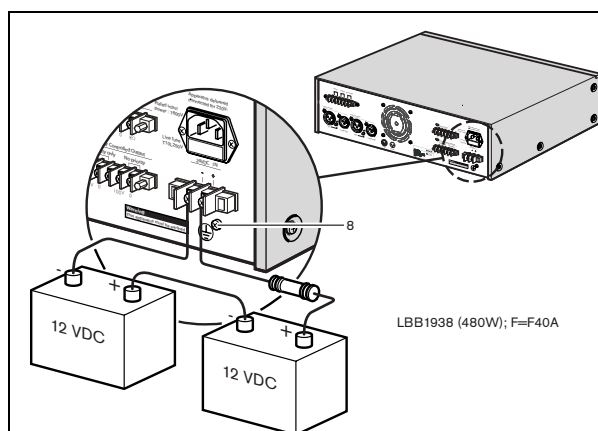


Figure 4.2

The booster amplifier has a 24 Vdc input (screw terminal), which you can use to connect a back up power supply, e.g. batteries. You can earth (8) the unit to increase the electrical stability of the system.



Caution

The connection cable must have an in-line fuse. Use the type of fuse as mentioned in the illustration.

4.2 Connecting the line input and loopthrough

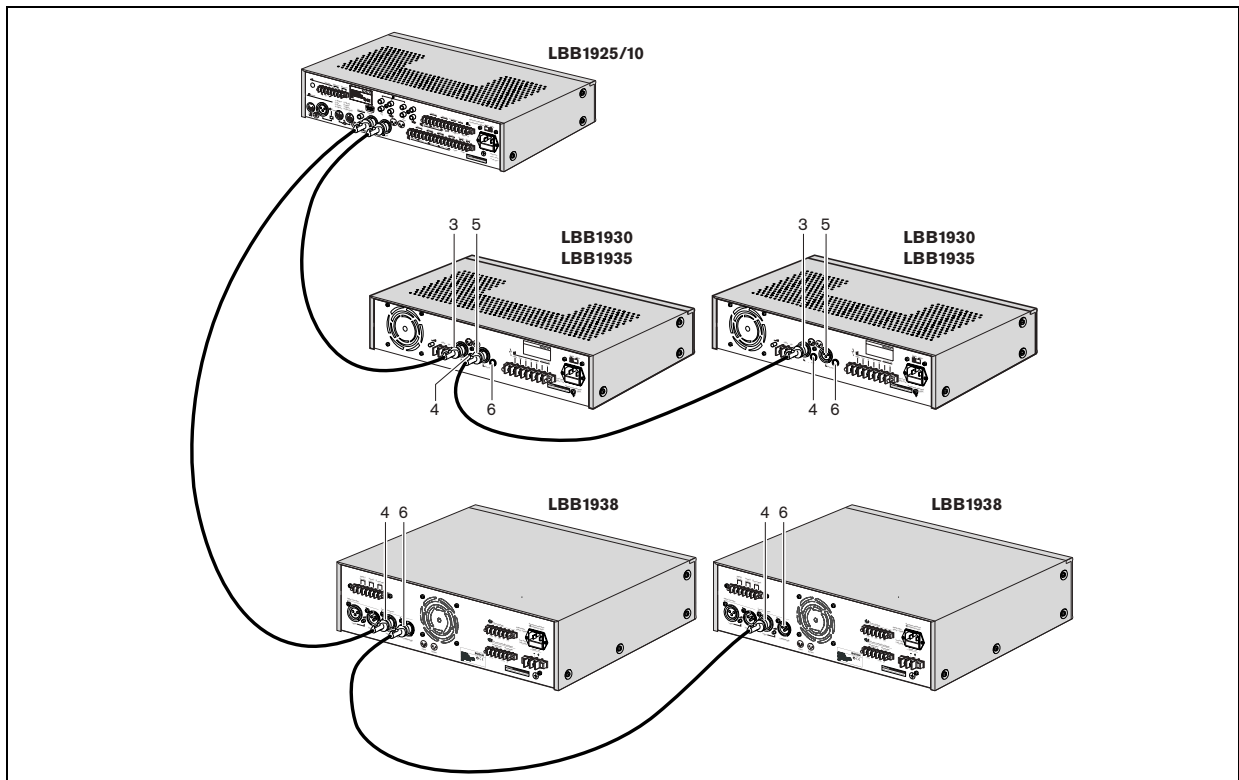


Figure 4.3

The booster amplifier has a balanced line input for connection to a preamplifier or a mixer. Use the loopthrough connection to connect the booster amplifier to another booster amplifier if more power is needed. Each power amplifier must be connected to its own set of loudspeakers. Do not connect booster outputs to each other. The LBB1930 and LBB1935 have both XLR (3 and 5) and phone jack connectors (4 and 6) for input and loopthrough. For the LBB1938 use program line - input 2 (4) and line loopthrough 2 (6) for normal operation without priority.

Volume control

Use the volume control next to the line input to set the output level of the booster amplifier.

4.3 Connecting the priority input and using the control terminals (LBB1938 only)

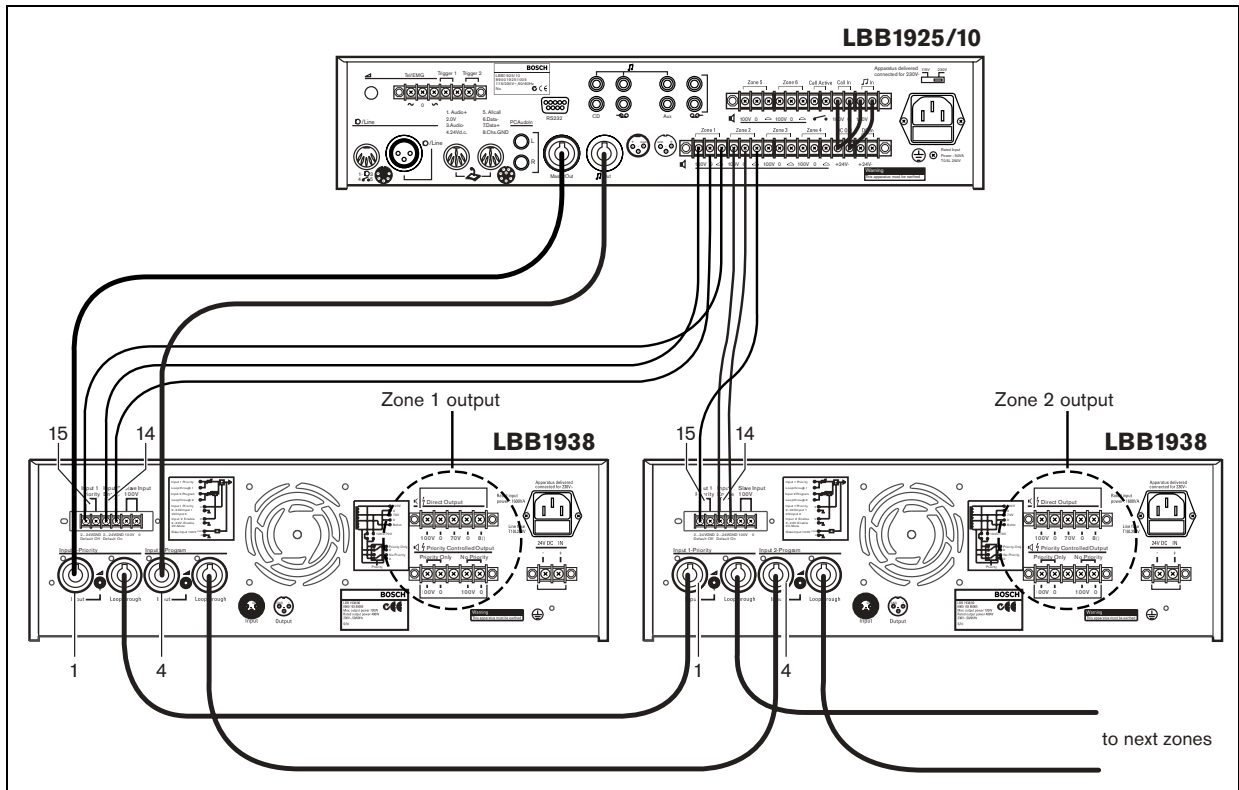


Figure 4.4

Next to the program input (Input 2-Program) the booster amplifier LBB1938 is also provided with a balanced priority input (Input 1-Priority) for connection to another preamplifier or mixer.

Apply a control voltage of 2...24 V to the input 1 priority control terminals (15) to switch ON the priority input (1) and mute the program input (4). In this way a local music source can be connected to the *program input* and a remote emergency system to the *priority input*. The emergency source must be able to supply the 2...24 V control voltage to override the local music source. The program input can be remotely controlled by using a switch that is connected to the input 2 enable control terminals (14).

Application example for use of the LBB1938 control terminals (see fig. 4.4)

You can use up to six LBB1938 boosters in combination with the Plena LBB1925/10 System Pre-amplifier to build a powerful multi-zone sound system. Zone switching of background music and calls is done via the LBB1925/10 zone relays in combination with the LBB1938 control terminals. The LBB1925/10 controls the background music by distributing 24 Vdc via the music zone relays to the LBB1938 input 2 enable control terminals (14). The LBB1925/10 controls the calls by distributing 24 Vdc via the call zone relays to the LBB1938 input 1 priority control terminals (15). Each booster serves one loudspeaker zone. Each zone can be OFF, or receive music or a call.

4.4 100 V slave input

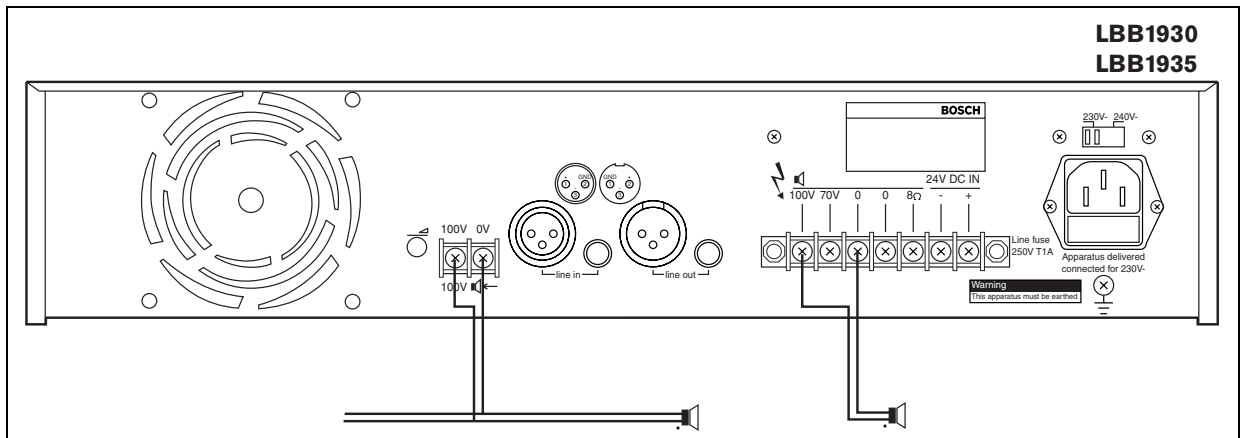


Figure 4.5

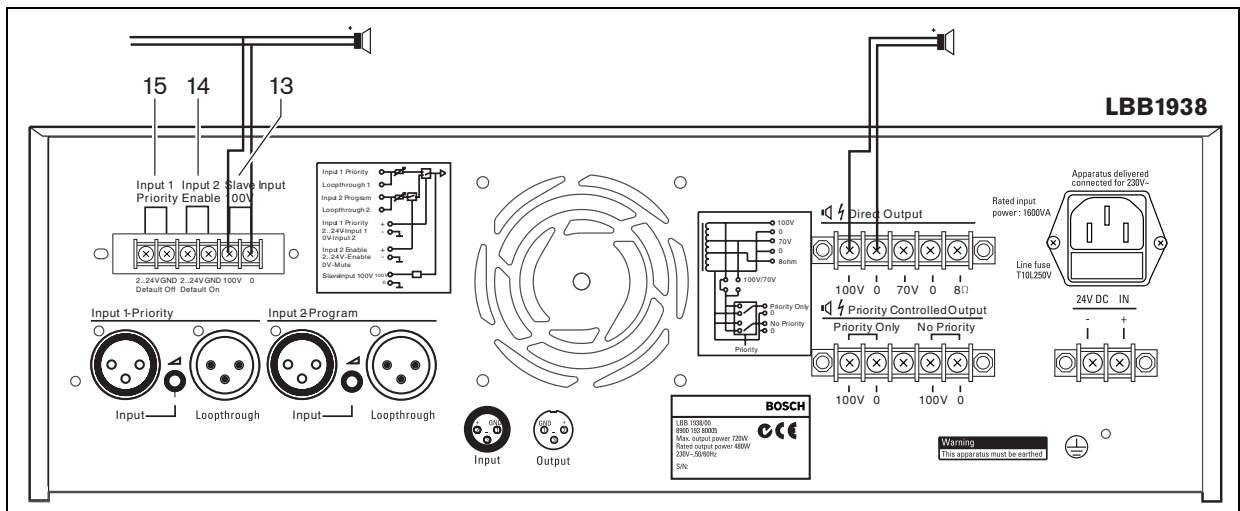


Figure 4.6

The booster amplifiers have a 100 V slave input that can be connected to an existing 100 V loudspeaker line. In this way it is easy to connect an additional booster amplifier on a remote location for more output power.

The 100 V input of the LBB1938 (13) is not affected by the control terminals for input 1 priority (15) or input 2 enable (14).

4.5 Connecting loudspeakers

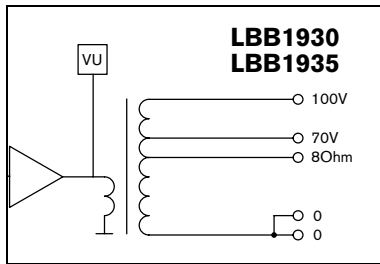


Figure 4.7

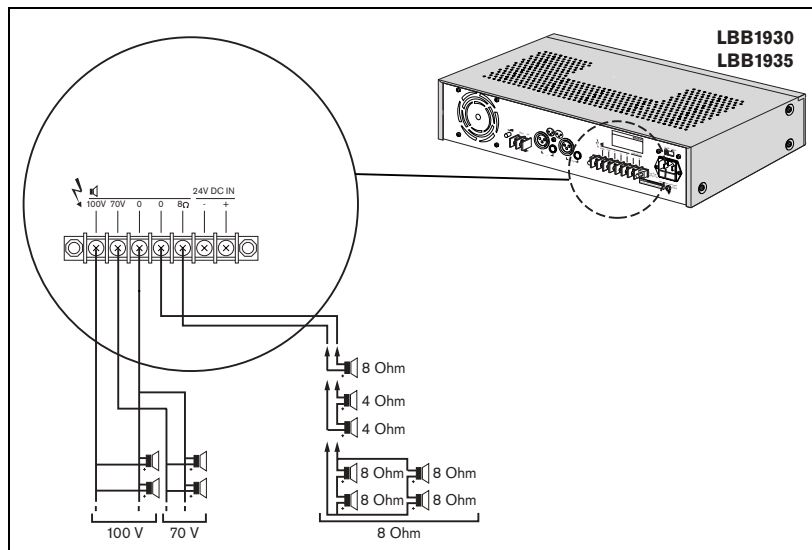


Figure 4.9

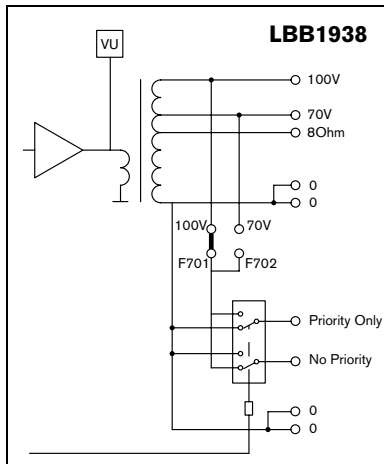


Figure 4.8

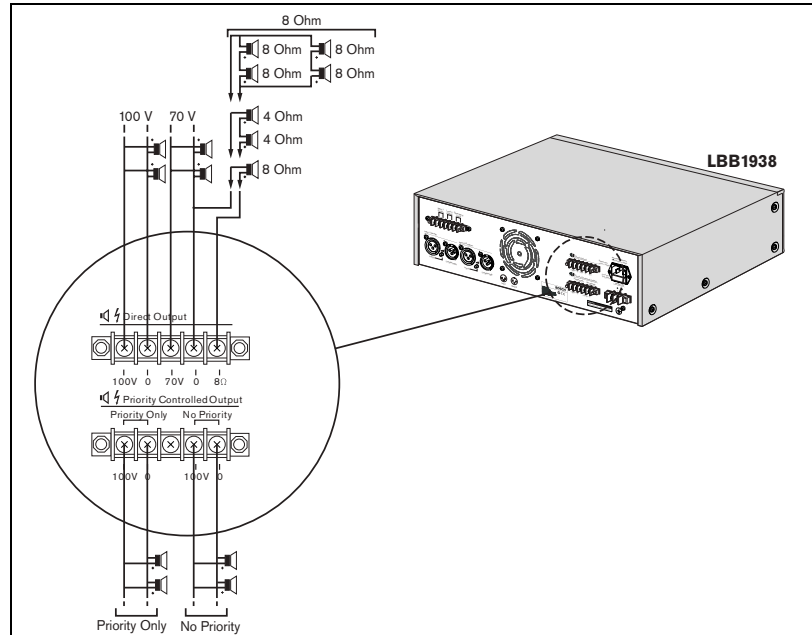


Figure 4.10

4.5.1 Constant voltage loudspeakers

The booster amplifier can drive 100 V constant voltage loudspeakers at full power (100 V) or half power (70 V). Connect the loudspeakers in parallel and check the loudspeaker polarity for in-phase connection. The summed loudspeaker power should not exceed the rated amplifier power.

LBB1938 only:

Ensure that the fuse for loudspeaker voltage selection is properly set (see chapter 2). The Priority Only and No Priority outputs are controlled by a priority relay. The Priority Only output only provides priority announcements, while the No Priority output just provides the program signal and switches OFF at priority calls. You can also use the Priority Only output for 3-wire remote volume control override. In this case, ensure that the selected voltage for the Priority Only output is the same as for the direct output used.

4.5.2 Low impedance loudspeakers

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.

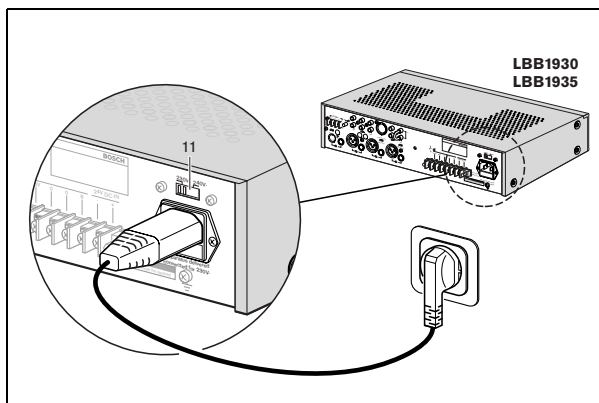
4.6 Mains connection

Figure 4.11

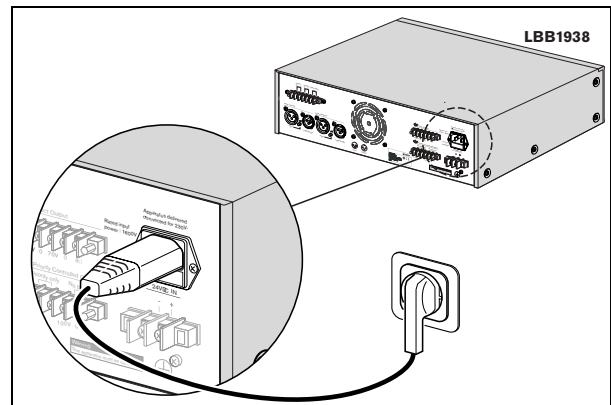


Figure 4.12

Use the supplied mains cord to connect the system to the mains supply.

**Note (LBB 1930 and LBB 1935 only)**

If necessary set the mains voltage switch 230/240 V (11) to the required voltage using a sharp object, e.g. a small screwdriver.

5 Operation of booster amplifier

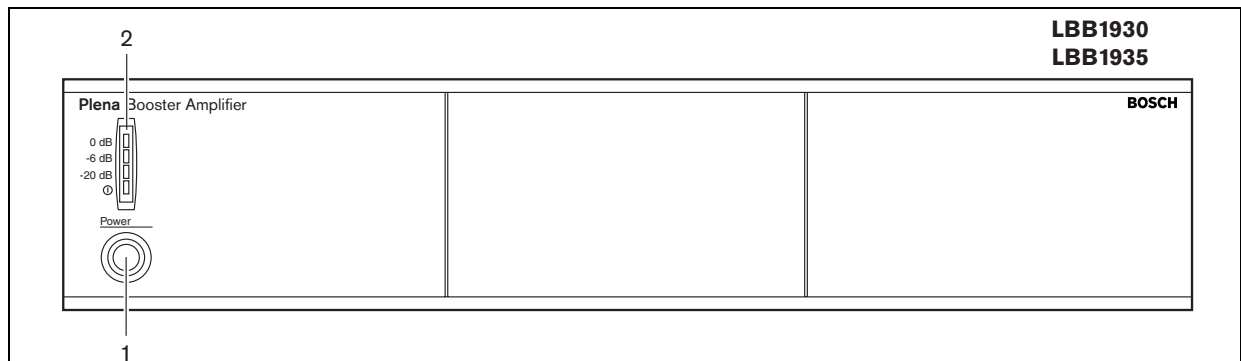


Figure 5.1

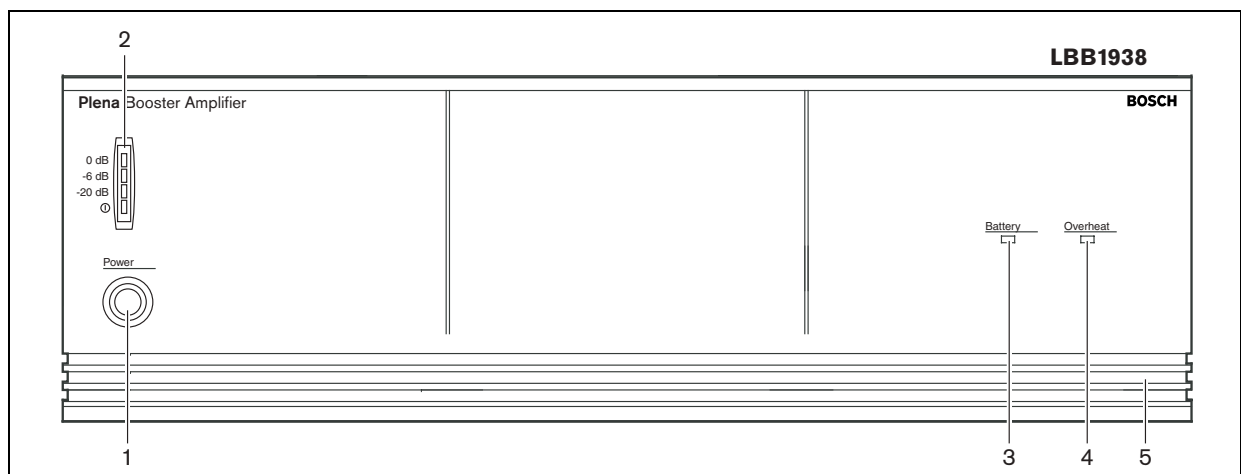


Figure 5.2

Upon switching ON the amplifier using the power button (1), the green Power On LED (2) lights up. The VU-bar shows the output level of the amplifier. If the internal temperature of the booster reaches a critical limit, due to poor ventilation or overload, an overheat protection circuit switches OFF the power stage.

LBB1938 only:

The overheat indicator (4) lights up if the power stage is switched OFF by the overheat protection circuit. The battery operation indicator (3) lights up if the mains power supply is failing and the back-up battery is in use.

6 Technical data

6.1 Electrical

Mains voltage

LBB1930/00, LBB1935/00	230/240 Vac, $\pm 10\%$, 50/60 Hz
LBB1930/50, LBB1935/50	110 Vac, $\pm 10\%$, 50/60 Hz
LBB1938/00	230 Vac, $\pm 10\%$, 50/60 Hz

Max mains power consumption

LBB1930/x0	400 VA
LBB1935/x0	800 VA
LBB1938/00	1600 VA

Max mains inrush current

LBB1930/00	8 A
LBB1930/50	16 A
LBB1935/00	9 A
LBB1935/50	19 A
LBB1938/00	19 A

Battery voltage

24 Vdc, $+20\%/-10\%$

Max battery current

LBB1930/x0	6 A
LBB1935/x0	11 A
LBB1938/00	30 A

6.2 Performance

Frequency response

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

Distortion

< 1% @ rated output, 1 kHz

S/N (flat at max volume)

LBB1930/x0	> 80 dB
LBB1935/x0	> 85 dB
LBB1938/00	> 90 dB

6.3 Inputs

Line input (3-pin XLR, 6.3 mm phone jack, balanced) - LBB1930/x0, LBB1935/x0

Sensitivity	1 V
Impedance	20 kOhm
CMRR	> 25 dB (50 Hz - 20 kHz)

Line input 1, 2 (3-pin XLR, balanced) - LBB1938/00

Sensitivity	1 V
Impedance	20 kOhm
CMRR	> 25 dB (50 Hz - 20 kHz)

100 V input (Screw, unbalanced)

Sensitivity	100 V
Impedance	330 kOhm

6.4 Outputs

Line loopthrough output (3-pin XLR, 6.3 mm phone jack, balanced) - LBB1930/x0, LBB1935/x0

Nominal level	1 V
Impedance	direct connection to line input

Line loopthrough output 1, 2 (3-pin XLR, balanced) - LBB1938/00

Nominal level	1 V
Impedance	direct connection to line input

Loudspeaker outputs (Screw, floating)

Max/rated output power	
70/100 V output	
LBB1930/x0	180 W/120 W
LBB1935/x0	360 W/240 W
LBB1938/00	720 W/480 W
8 Ohm output	
LBB1930/x0	31 V (120 W)
LBB1935/x0	44 V (240 W)
LBB1938/00	62 V (480 W)
Output power @ 24 V battery operation	-1 dB ref. rated power

6.5 Environmental conditions

Operating temperature range	-10 to +55 °C
Storage temperature range	-40 to +70 °C
Relative humidity	< 95%

6.6 General

EMC emission	acc. to EN 55103-1
EMC immunity	acc. to EN 55103-2
Acoustic noise level of fan	
LBB1930/x0, LBB1935/x0	< 45 dB SPL @ 1 m
LBB1938/00	< 48 dB SPL @ 1 m
Dimensions	
LBB1930/x0, LBB1935/x0	100 x 430 x 270 mm (19" wide, 2U high, with feet)
LBB1938/00	145 x 430 x 370 mm (19" wide, 3U high, with feet)
Weight	
LBB1930/x0	approx. 10.5 kg
LBB1935/x0	approx. 12.5 kg
LBB1938/00	approx. 25 kg
19" mounting brackets	included

For more information visit
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