



PL70BS

DIFFUSORE ACUSTICO ANTIFIAMMA A PLAFONIERA
FIRE PROTECTION CEILING SPEAKER
PLAFONNIER ACOUSTIQUE PARE-FLAMME
FLAMMENGESCHÜTZER DECKENLAUTSPRECHER
DIFUSOR ACÚSTICO ANTILLAMA A PLAFÓN

MANUALE D'INSTALLAZIONE E D'USO
INSTALLATION AND OPERATION MANUAL
INSTRUCTIONS D'INSTALLATION ET D'EMPLOI
INSTALLATIONS UND BEDIENUNGSANLEITUNG
MANUAL DE USO Y DE INSTALACION

Symbols used in the manual



WARNING: This symbol indicates very important instructions which must be followed carefully in order to prevent personal injury.



VERY IMPORTANT - This symbol indicates instructions that must be followed to the letter in order to prevent possible equipment damage or malfunctions. To ensure correct use of the product, it is indispensable to read and remember this information.



A CLOSER LOOK - This symbol calls attention to particular details, special instructions, suggestions, or other useful information.

1. Safety first!

Before installing and using this product, please read this instruction manual carefully and keep it on hand for future reference. Follow all the instructions to the letter.

WARNING: This product has been designed for installation only by qualified personnel having the technical know-how and experience or specific instructions to ensure correct execution of all the operations involved and to prevent any risk to personal safety. There are numerous factors that must be taken into consideration when installing a professional sound system, including mechanical and electrical evaluations as well as studies related to coverage and acoustic performance. We therefore strongly recommend that you have this product installed only by professional installers or specialized firms.

1. Attention to the precautions – Always follow the precautions provided on this product and in the instruction manual.
2. Water and humidity – Do not use this product near water; for example, in the vicinity of a bath tub or sink, in a damp cellar, near a swimming pool, etc..
3. Foreign bodies and liquids – Be careful not to allow any foreign bodies or liquids to come into contact with this product.
4. Installation – Do not install this product in any way that is not provided for in the instruction manual
5. Technical service – The user should never attempt to make any repairs on this product unless otherwise indicated in the instruction manual. All repairs should be made by qualified service technicians.
6. Respect the safety standards – The entire sound system must be created in compliance with the current standards and laws regarding electrical systems.
7. Specifications – When installing and using this product, keep in mind the technical specifications indicated in the dedicated section of this instruction manual.
8. Accessories – Install and use this product only with the accessories specified by the manufacturer or supplied with the product.



Hearing loss - Exposure to high sound levels can cause permanent hearing loss. The sound pressure level which leads to hearing loss varies considerably from one person to another, and depends on the duration of exposure. The U.S. Government's Occupational Safety and Health Administration (OSHA) has established the maximum sound pressure levels that can be withstood without causing damage, which are shown in the table below.

According to the OSHA regulations, any exposure over the maximum limits indicated in the table can reduce the hearing capacity of a person. To prevent potentially dangerous exposure to high sound pressure levels, anyone subjected to such levels must use suitable protection. When an product capable of producing high sound levels is being used, it is therefore necessary to wear ear plugs or protective earphones when the limits shown in the table are exceeded.

Duration per day (hours)	Sound level (dBA)	Typical example
8	90	Duet in a small club
6	92	
4	95	Underground train
3	97	
2	100	Classical music played at high volume
1.5	102	
1	105	
0.5	110	
0.25 or less	115	Particularly "hard" music at a rock concert



Consult the specifications provided in the instruction manual to know the maximum sound pressure (SPL) the speaker is capable of producing.

Contents

1. SAFETY FIRST!.....	7
2. OPERATING PRECAUTIONS	9
3. INTRODUCTION	9
4. INSTALLATION	9
5. CONNECTIONS	10
CONNECTING THE TERMINAL STRIP	10
CONNECTING THE LINE TRANSFORMER	10
EARTHING THE SPEAKER	10
6. SERVICE	11
7. APPENDIX A - Inputs cables.....	11
8. SPECIFICATIONS	11
9. FIGURES	27

2. Operating precautions

- Do not use solvent, alcohol, benzene, or other volatile substances for cleaning the external parts of the speaker.
- Do not use the speaker in tropical climates.
- If the speaker is used in particularly cold places, drive it with a low signal for 5-10 minutes before using it at maximum power.

3. Introduction

The PL 70 BS ceiling speaker, equipped with a fire protection steel base, can be installed flush-mounted in false ceilings or panels. It is particularly suitable for reproducing alarm messages, as it provides particularly intelligible voice reproduction and is resistant to the high temperatures that can be reached during a fire. The PL 70 BS has the following main features.

- High quality voice reproduction.
- Dual cone loudspeaker, diam. 160 mm (6"), featuring a broad frequency response and broad dispersion.
- Transformer for connection to constant voltage lines (70 V / 100 V).
- Possibility to select the output power from among several values.
- Steel construction, with metal protection grille.
- Fire protection steel base with an attachment system that ensures quick installation.
- Two ceramic terminal strips for connecting the input and output cable (IN/OUT).
- Support for connection terminals can be removed from the base to facilitate making connections.
- Possibility to complete the connection of the audio line to the terminal strip of the base without having to install the loudspeaker.
- Quick system for hooking the speaker to the base by means of two springs.
- Earth screws.
- Fire protection internal cables.
- Thermic fuse that prevents damage to the audio line due to heat on the speaker

4. Installation



WARNING: Make sure that the speaker is installed in a stable and secure way in order to avoid any conditions that may be dangerous for persons or structures.

Check to make sure that the support surface (e.g. wall, etc.) has the necessary mechanical characteristics to support the weight of the speaker without the danger of it falling.

Before suspending the speaker, carefully check all the components to be used to make sure that there is no damage, deformation, corrosion and/or missing or damaged parts that could reduce the safety of the installation.

In outdoor use, avoid installing the speaker in places exposed to harsh weather conditions.

The PL 70 BS is designed for flush-mount installation in false ceilings. Before installing the speaker, make sure that there is sufficient space behind the false ceiling panel to hold the speaker: with respect to the support surface of the front flange of the speaker, a free space of 125 mm (4.92") depth is necessary.

1. Drill a hole of diameter 202 mm (7.95") in the false ceiling panel, as shown in Figure 2 on page 27.
2. Loosen the two wing bolts A (Fig. 1, page 27) that secure the two attachment plates B (Fig. 1) and move the plates upward; then secure the two plates B by retightening the two wing bolts A.
3. Insert the fire protection base in the hole previously drilled, as shown in Figure 2 on page 27.
4. Loosen the two wing bolts A again and move the two attachment plates B downward, as shown in Figure 3 on page 28, to secure the base to the false ceiling. When this operation is completed, retighten the two wing bolts A.
5. Hang the speaker onto the base, fitting the ends of one of the two support springs C on the speaker into one of the hooks D on the base, as shown in Figure 4 on page 28.
6. Make the electrical connections as described in the section below.
7. Fit the ends of the other support spring C to the second hook D on the base.
8. Push the speaker into the base until the front flange lays against the false ceiling.

5. Connections



WARNING: To prevent the risk of electric shock, do not connect the speaker with the amplifier switched on.

Before using the speaker, carefully check that all the connections have been made correctly to make sure there are no accidental short circuits that could cause electrical sparks.

The speaker is factory-set for direct connection to audio lines at constant voltage of 100 V.

The speaker can be driven by constant voltage lines at 70 V or 100 V. Speaker connection is composed of two phases: connecting the terminal strip in the base, and connecting the line transformer attached to the loudspeaker.

When making the connections, keep the following indications in mind (Fig. 5, page 29).

- The input voltage selected on the speaker must correspond with the voltage selected on the amplifier.

- The sum of the operating power values of all the speakers connected to the audio line must not exceed that of the amplifier.

- To ensure correct audio reproduction, the connections should be made "in phase", where the +/- polarities of the amplifier output correspond with the +/- polarities of the speaker input.



A CLOSER LOOK: When two speakers reproduce the same frequencies but with phase differences, these frequencies may be annulled. In sound systems, speakers are often situated in adjacent positions and the sound waves

produced interact with each other. If a speaker is connected incorrectly; i.e. the polarity of the audio line conductors is inverted, the audio signals are transmitted with differences in phase and correct reproduction is therefore jeopardized.

Connecting the terminal strip

Connections with the audio line are made using the two ceramic terminal strips IN and OUT situated inside the base, and can be made even without the presence of the speaker, which can be installed at a later time. The IN +/- terminals are used for audio signal input and the OUT +/- terminals, being directly connected to the corresponding IN +/- terminals, can be used as an output for connecting an additional speaker in parallel (Fig. 6, page 29).

1. Run the conductors to be connected through the two rubber cable guides I (Fig. 6, page 29) on the base.
2. Connect the IN - conductor of the speaker to the negative conductor (-) of the audio line input, which leads from the amplifier terminal marked -, 0, or COM (Fig. 6).

3. Connect the IN + conductor of the speaker to the positive conductor (+) of the audio input line (Fig. 6).
4. Follow the same logic for connecting the OUT +/- terminals with the output line used to drive an additional speaker to be connected in parallel.



A CLOSER LOOK: To facilitate connections, especially when using particularly rigid fire protection cables, the ceramic terminals can be removed from the base by unscrewing the wing bolt E (Fig. 1, page 27) that secures the terminal support.

Connecting the line transformer

The line transformer F (Fig. 1, page 27) of the speaker must be connected to the terminal strip on the base using the two conductors with FASTON connectors already connected to the terminal strip.

1. Connect the FASTON connector marked COM to the terminal marked COM on the line transformer of the speaker (Fig. 7, page 30).
2. Connect the FASTON connector marked TAP to the terminal of the line transformer marked with the output power desired and the voltage of the audio line (Fig. 7). Be careful not to confuse the power indications referring to the 70 V input voltage with the power indications referring to the 100 V input voltage (e.g. 6W/70V with 6W/100V).



VERY IMPORTANT: To avoid damaging the speaker, never use the terminal of the transformer marked 6W/70V when the speaker is supplied with 100 V lines.

Earthing the speaker

1. Run the protective conductor of the local earth system through one of the rubber cable guides I (Fig. 6, page 00) on the speaker base.
2. Connect the protective conductor of the local earth system to the terminal on the base marked with the earth symbol \perp (Fig. 6).
3. Tighten the earth screw L (Fig. 7, page 30) of the speaker, and insert the forked terminal at the end of the GREEN conductor of the terminal strip under the washer of the screw.
4. Tighten the earth screw L (Fig. 7).

6. Service

If the product seems to be not operating correctly, before contacting the service centre, carry out all the tests the may confirm the malfunction. In many products taken to the service centre, it is not possible to reproduce the malfunction indicated because the problem is probably to be found elsewhere in the sound system. If the product does require service, place it in its original packaging and take it to your local dealer or to the nearest service centre.

7. Appendix A- Input cables

For connecting the speaker use cables with an adequate cross-section. The greater the distance between the amplifier and the speaker, the larger the connection cable cross-section should be.

To prevent inductive phenomena from giving rise to humming or disturbance that jeopardize the effective operation of the audio system, the speaker cables should not be run together with electrical energy conductors, microphone cables, or low level audio lines (e.g. LINE level).

To facilitate the "in phase" connection of the speaker, use bipolar cables that have markings to distinguish the polarity (e.g. insulation of different colours, conductors of different colours, ect.).

To minimize the inductive effects (hum) due to coupling with surrounding electrical fields, use cables with conductors braided together.

8. Specifications

Acoustic system

Frequency range (-10 dB):
150 Hz - 14 kHz

Frequency response (-3 dB):
200 Hz - 7 kHz

Angle of coverage:
[1000Hz]: 160°
[2000 Hz]: 80°
[4000 Hz]: 90°

Sensitivity¹:
95 dB 1W @ 1 m

Maximum sound pressure (SPL):
109 dB @ 1 m (3.3 ft.), maximum power

Impedance:
70 V: 6533Ω - 0.75W; 3300Ω - 1.5W;
1660Ω - 3W; 817Ω - 6W
100 V: 6533Ω - 1.5W; 3300Ω - 3W;
1660Ω - 6W

System power²:
6W nominal (IEC), 24W peak

Input voltage:
70V, 100 V

Selectable power values:
70V: 0.75 W - 1.5 W - 3 W - 6 W
100 V: 1.5 W - 3 W - 6 W

Thermic fuse:
150° C

Transducers

Extended range:
1 dual cone loudspeaker diam. 160 mm (6")

Physical characteristics

Main body:
Steel

Base: Steel

Attachment system:
Flush-mount

Inputs: Ceramic terminal strip

Dimensions (diam. x depth):
Ø 230 x 22 mm, front piece (Ø 9.06" x 0.86")
Ø 216 x 125 mm, base (Ø 8.50" x 4.92")

Weight: 2.0 kg (4.4 lbs.)

1 Measured on the axis in free field, with input signal of 1 watt (2.83 V RMS @ 8ohm) and referring to one metre of distance using the inverse square root law. The sound pressure indicated represents an average from 300Hz to 3kHz.
2 Nominal power: IEC test lasting 100 hours, with crest factor of +6dB.

Disclaimer

MACKIE DESIGNS (ITALY) S.p.A. applies a company policy based on constant research and development. With the aim of constantly improving our products, we reserve the right to make any aesthetic or functional modifications at any time and without prior notice.

RCF is a registered trademark of MACKIE DESIGNS (ITALY) S.p.A.

Any other trademark mentioned herein is a trademark or registered trademark of the respective owners, who we gratefully acknowledge.
©2002 MACKIE DESIGNS (ITALY) S.p.A.. All rights reserved. Printed in Italy.

9. Figure · Figures · Figures · Abbildunge · Figuras

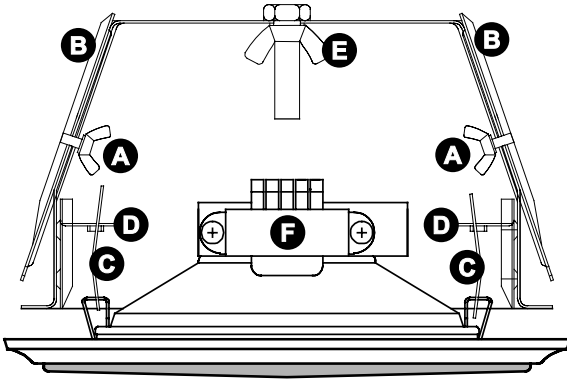


Fig./Abb.1

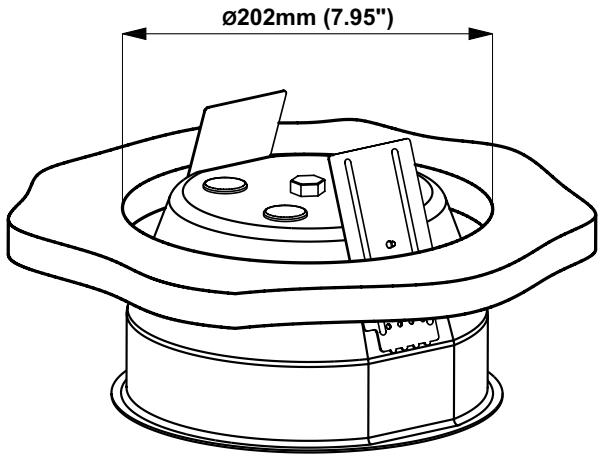


Fig./Abb.2

Fig./Abb.3

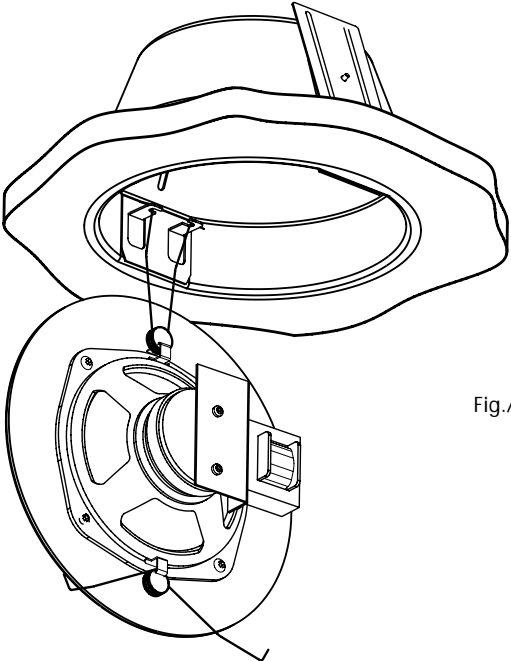
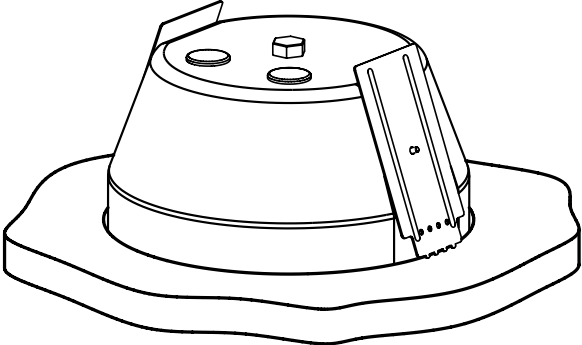
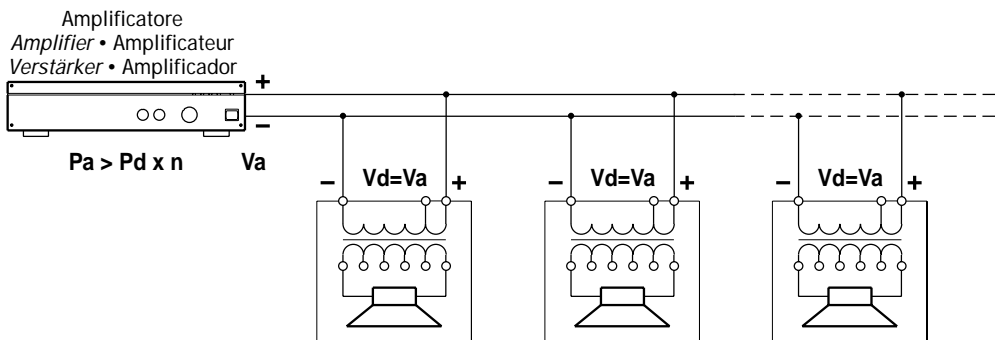


Fig./Abb.4



P_a = Potenza amplificatore • *Amplifier power* • Puissance amplificateur • *Leistung des Verstärkers*
 Potencia amplificador.

P_d = Potenza diffusore • *Speaker power* • Puissance enceinte • *Leistung des Lautsprechers* • Potencia difusor.

n = Numero diffusori • *Number of speakers* • Nombre d'enceintes • *Anzahl der Lautsprechers* • Numero difusores.

V_d = Tensione ingresso diffusore • *Speaker input voltage* • Tension entrée enceinte

Eingangsspannung des Lautsprechers • Tension entrada difusor.

V_a = Tensione uscita amplificatore • *Amplifier output voltage* • Tension sortie amplificateur

Ausgangsspannung des Verstärkers • Tension salida amplificador.

Fig./Abb. 5 - Collegamento di diffusori in un impianto a tensione costante.

Connecting speakers in a constant voltage system.

Connexion d'enceintes dans un système à tension constante.

Anschluss der Lautsprecherboxen an einer Anlage mit konstanter Spannung.

Conexión de difusores en una instalación a tensión constante.

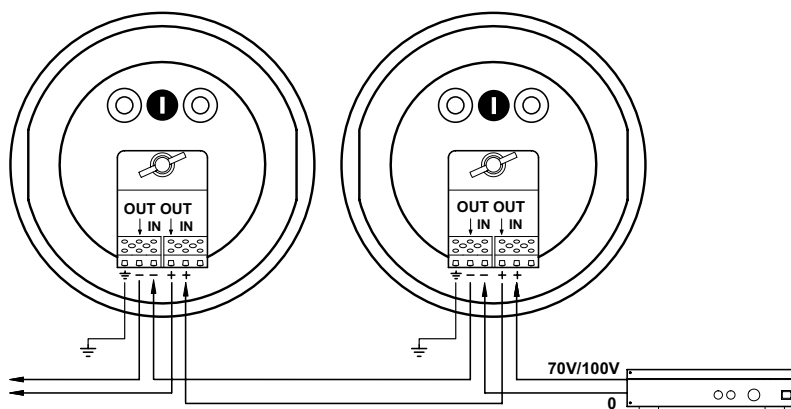


Fig./Abb. 6 - Collegamento alla morsetteria • *Connecting the terminal strip* • Connexion du bornier

Anschluss der Klemmleiste • Conexión de la caja de bornes

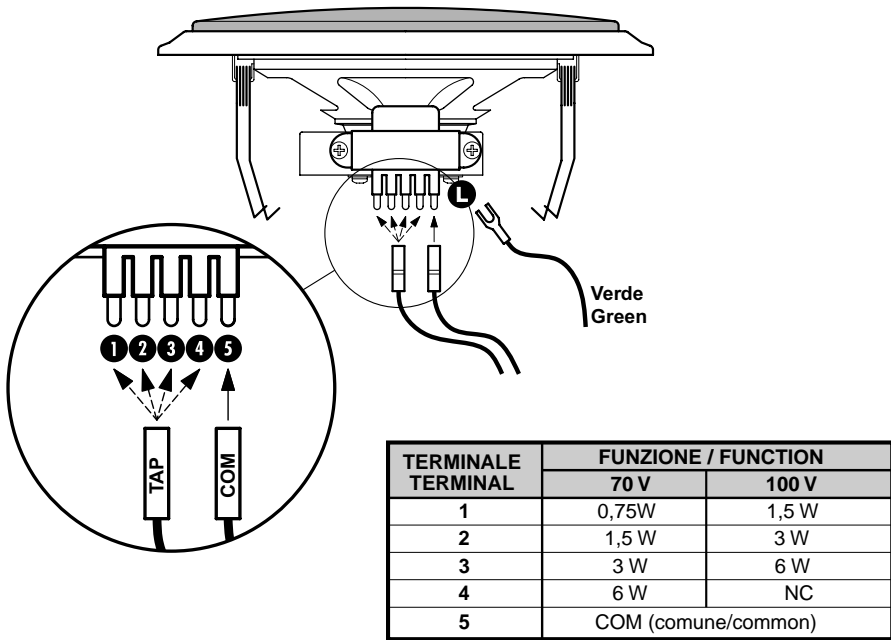


Fig./Abb. 7 - Collegamento del trasformatore di linea • *Connecting the line transformer* • Connexion du transformateur de ligne • *Anschluss des Leitungstransformators* • Conexión del transformador de línea

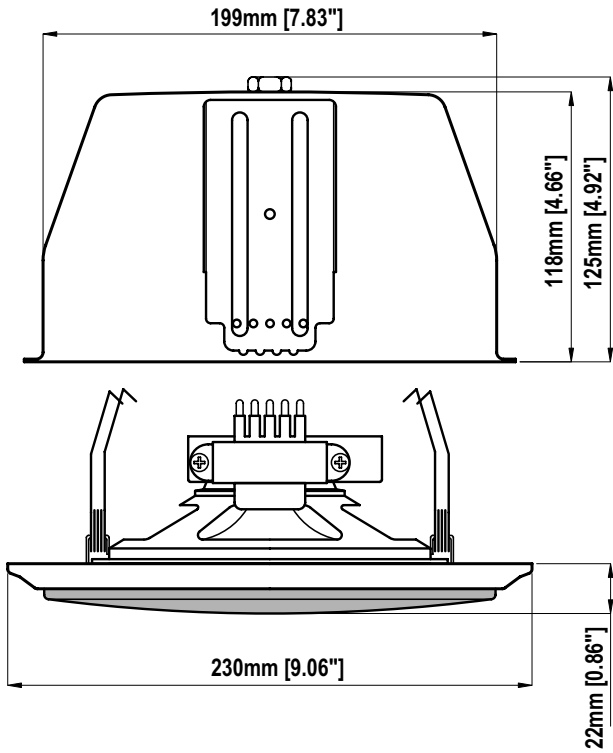


Fig./Abb.8 - Dimensioni • *Dimensions* • Dimensions • *Abmessungen* • Dimensiones

Mackie Designs (Italy) S.p.A.

Sede legale e Stabil.: 42010 Mancasale (RE) - Via Raffaello, 13 - Tel. (0522) 274411 - Fax (0522) 926208
Sede Amministr. e Uff. Commer.: 42029 S. Maurizio (RE) - Via G. Ferraris, 2 - Tel. (0522) 354111 - Fax (0522) 551875