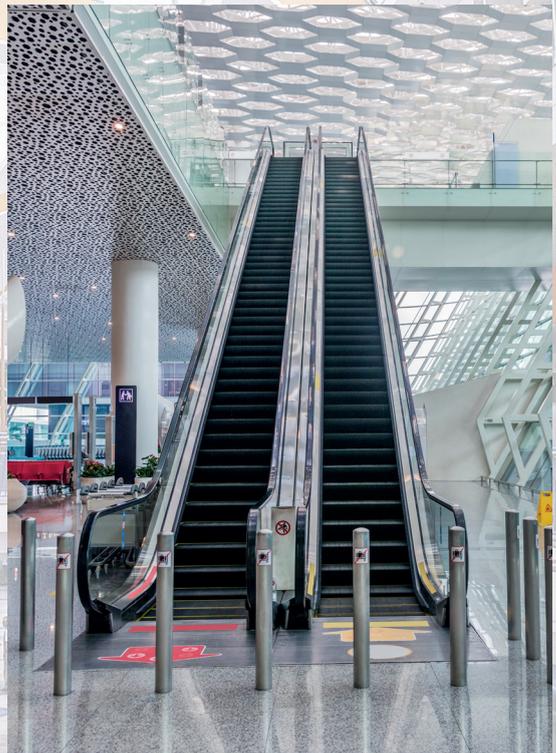
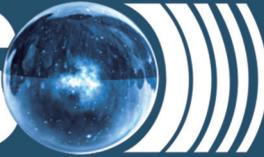


GENERAL CATALOGUE

PA Sound Broadcasting



pas 
SOUND SYSTEM SPECIALIST



Historical origins..

PASO S.p.A. is an industrial company established in 1973 as the result of the enthusiastic work of the managerial and technical staff previously employed by the historical Milan-based company GELOSO, active since 1931 and international leader on the market of professional sound-broadcasting. PASO took over GELOSO's trademark, their patents and a valuable heritage of experience, skills and technical knowledge.

With roots firmly embedded in solid and prestige know-how, the company continued to increase its knowledge in the field of system and industrial engineering, with the primary aim of constant evolution of its Public Address products, in terms of technology, quality and reliability.



*A gli interessati all'arte radiofonica
nessa utile il nostro sforzo
volontoso e costante per
raggiungimento di un sempre
più alto livello di perfezione -*
Geloso



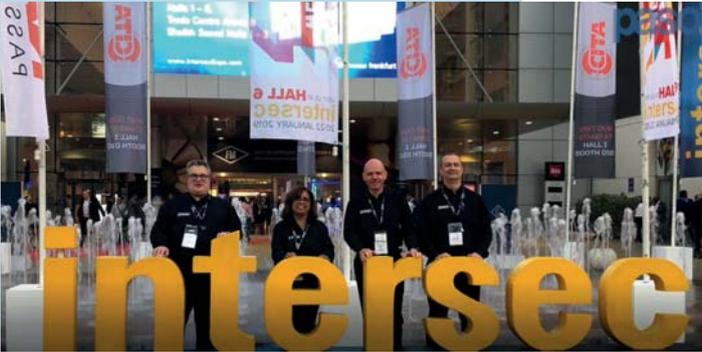
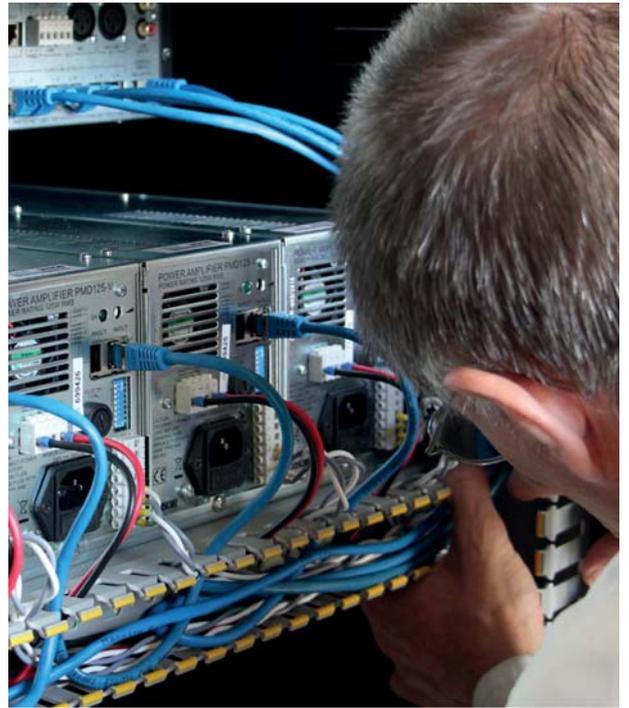
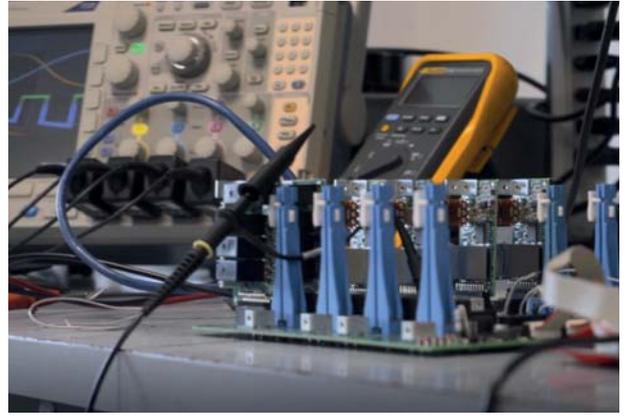
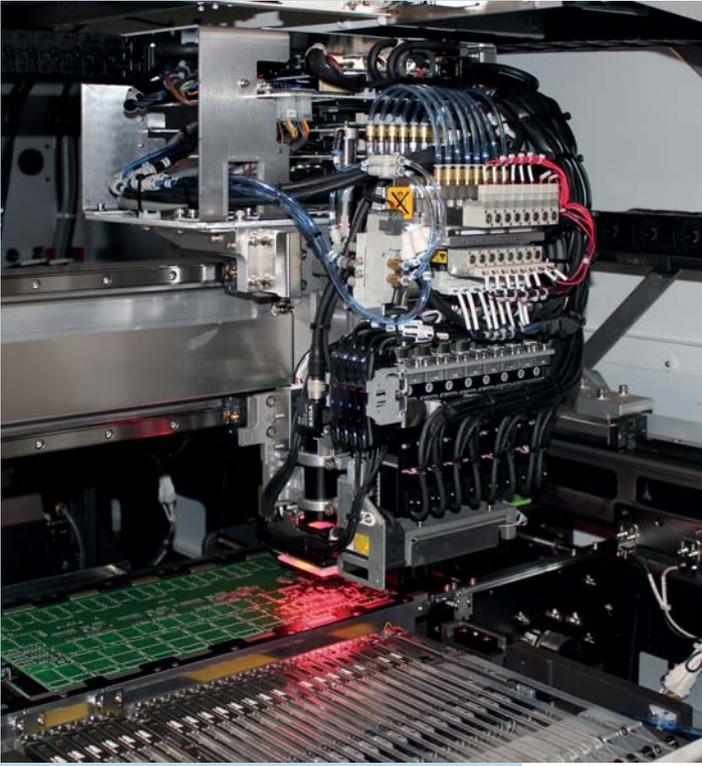
...an important reality.

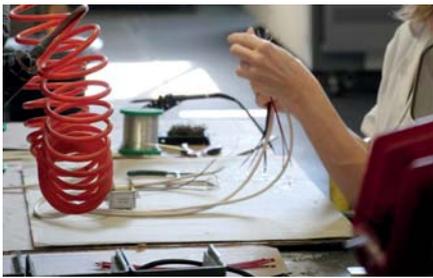
PASO S.p.A is now a leading company on the sound-broadcasting, congress and voice evacuation system markets and is highly appreciated both in Italy and abroad.

The key issue of the company's policy is customer satisfaction, achieved by ensuring top-quality products and a top-quality service, pursued consistently and with enthusiasm, and supported by a catalogue of products able to meet all sorts of different needs as well as by a competent and professional sales department. All this is topped by the guarantee provided by the Quality System certified according to the latest version of UNI EN ISO 9001.

In the current global marketplace context, PASO S.p.A. claims with well-justified pride its identity as an Italian manufacturing company that designs, develops, makes and markets its own products. Thanks to the commitment and professional skills of its personnel, the company has always remained in step with the technological evolution of both its products and its manufacturing activities, complying with the appropriate standards and directives that have succeeded each other in time.





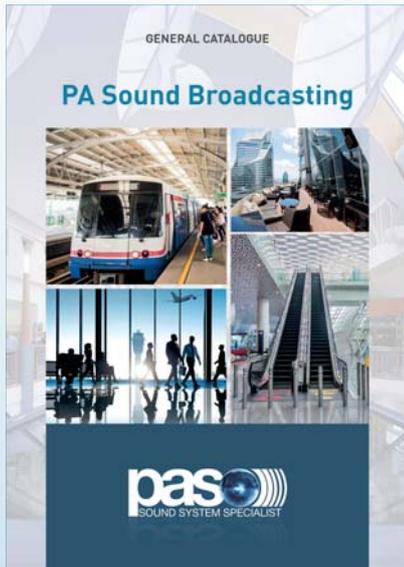


PASO is...

- ✓ Knowledge
- ✓ Professionalism
- ✓ Reliability

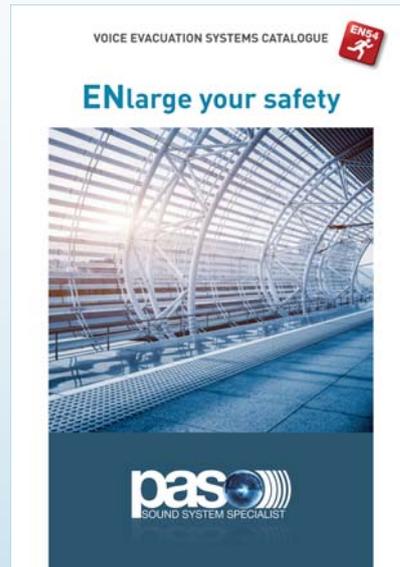


Our catalogues



GENERAL CATALOGUE PA Sound broadcasting

The **PA Sound broadcasting** catalogue includes the main product lines offered by PASO and it's intended to mark the Company's constant commitment. It is a useful tool for designing and creating sound amplification and conference systems for small and medium-sized applications. PASO also offers complete solutions for audio systems applied to emergency services and congress systems.



VOICE EVACUATION ENlarge your safety

The **ENlarge your safety** catalogue includes all the sound broadcasting systems designed by PASO specifically for voice evacuation: our response to the specific requirements of the laws in force today. This set out in detail the features that an electroacoustic system designed for audio evacuation and emergencies in places where the general public is present in large numbers must have.



Follow us on social media!

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SYSTEMS

PASO provides complete audio solutions for conventional sound-broadcasting systems and for systems applied to emergency able to manage alarm situation.





The new **MIM1000** system allows for the supervision via LAN of sound broadcasting systems and EN54 voice evacuation systems, with the advantage of being able to manage everything from the comfort of your smartphone and tablet (iOS/Android) or your PC (Windows/Mac OSX).

The all-in-one **SOURCE1000** multi-source module is characterised by its compact size and can be installed in 503 wall-mount boxes with the use of special adaptors (see next page). **SOURCE1000** has been designed for all applications where a compact and complete audio source is required which is able to easily connect with all the digital media devices on the market today, such as USB sticks or multimedia devices with a BLUETOOTH connection.

SOURCE1000 features an FM radio tuner, a USB port (only for reading music files from a mass storage device such as a USB stick - with FAT16 or FAT32 file system, max. cap. 16GB), Bluetooth receiver for streaming audio from a mobile device (smartphone, tablet, etc.), two auxiliary stereo audio inputs to connect additional external audio sources, a pre-amplified stereo audio output and a balanced pre-amplified mono output. It also has a balanced microphone input for connection to a microphone unit, allowing for speaker announcements with priority over any background music. This input is activated by a priority contact. The multi-source module is available in black (**SOURCE1000-B**) and white (**SOURCE1000-W**).



SOURCE1000-B



SOURCE1000-W

FUNCTIONAL FEATURES

- OLED display.
- USB audio file player (MP3, WMA, AAC).
- Bluetooth with playback control (play/pause, next/previous track).
- FM radio with RDS, 6 preset frequencies.
- 3-band graphic equaliser - HIGH MID LOW.
- Dual AUX input for local sources (e.g. TV, CD, PC, Sky...).
- Automatic ON/OFF function depending on the presence of a signal in the AUX1/AUX2 input.
- Balanced input for microphone unit.
- Balanced mono audio output.
- Stereo audio output.
- Selectable standby screen.
- Clock and alarm clock (programmable timer function for automatic ON/OFF).
- Compatible with all-in-one evacuation systems **PAW4500-VES**, **PAW5500-VES** and **PAW51K-VES**.



With the supplied IR remote control, you can use all the commands that you can physically control directly from the device, except for login and navigation within the menu.



The **MIM1000-ILan interface module** is an IP network supervision system for EN54 systems and SOURCE1000 audio devices, which allows you to manage them through a dedicated app; it is compatible with the compact all-in-one evacuation systems of the PAW4500-VES, PAW5500-VES and PAW51K-VES series and with the SOURCE1000 multi-source modules.

- > **When interfaced with EVAC PAW systems** through the MIM1000-IMod module, it allows you to use a dedicated app to remotely control the status of the EVAC system, providing status and fault information for it.
- > **When interfaced with the SOURCE1000 module**, it allows you to manage the main functions and view status information through the app.

The **Paso MIM1000 app**, which can be downloaded from the digital stores for Android/iOS operating systems, can be customised at the user interface level using dedicated software. The module allows for simultaneous control of compact EVAC systems in the PAW series and the SOURCE1000 source modules installed in the system in a quick and easy way from your smartphone and tablet (Android and/or iOS operating systems).

The **MIM1000-IMod PAW/MODBUS interface module** makes it possible for the EVAC systems of the PAW4500-VES, PAW5500-VES, PAW51K-VES series and the ModBus RTU protocol to communicate with one another; the ModBus address can be configured via a frontal dip-switch. The module features a front panel offering LED diagnostics of the existing communication between Modbus and LINK connection of the EVAC PAW systems, as well as the emission of an acoustic alarm in case of failure to communicate.



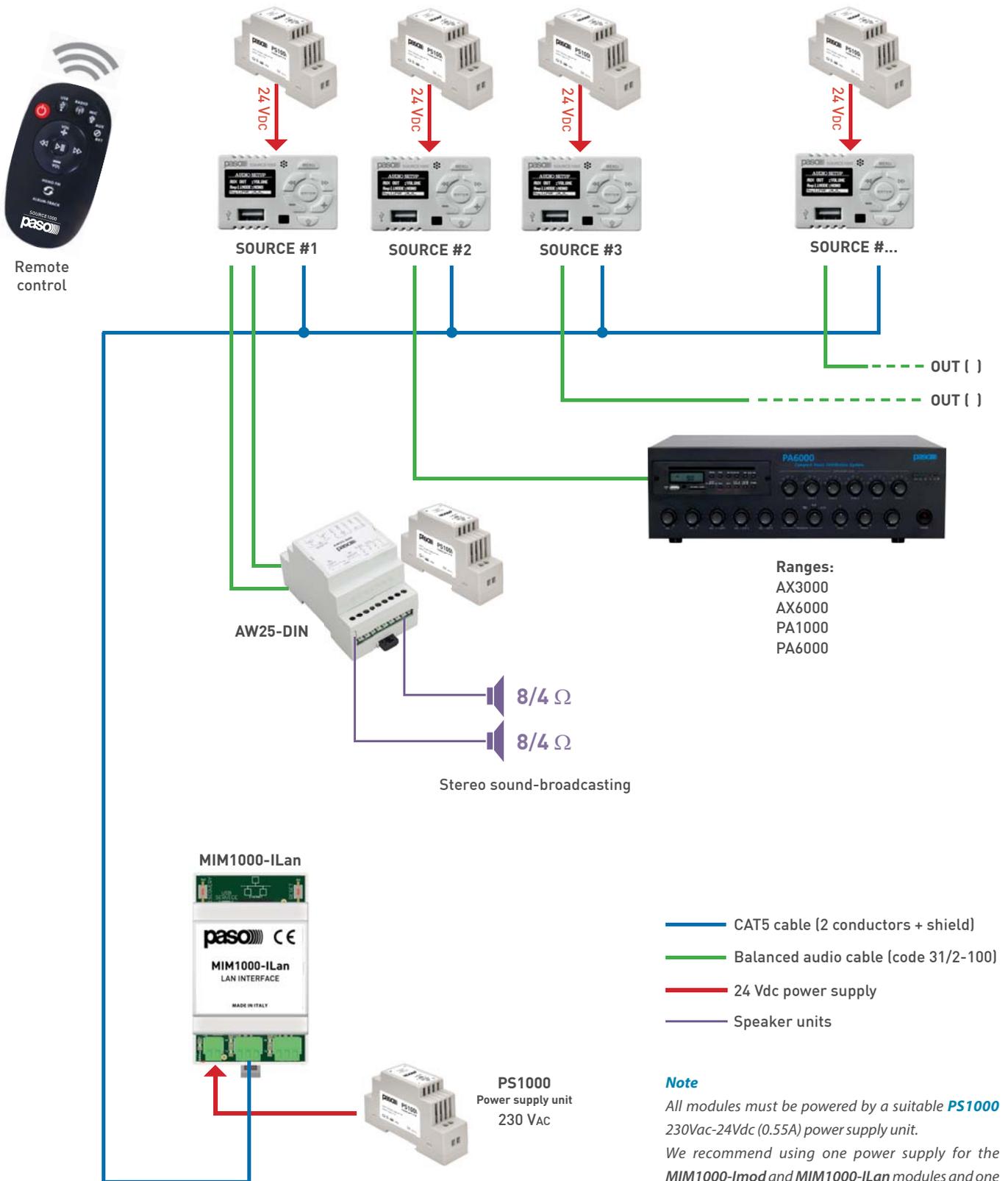
SOURCE1000 | Adaptors for the domestic range

CODE	COLOUR	DOMESTIC RANGE
ACMIM-1B	Charcoal grey	ABB Elos, GEWISS Playbus, VIMAR Idea
ACMIM-1W	White	
ACMIM-2B	Charcoal grey	BTICINO International / Air / Living / Luna / Modo - MASTER
ACMIM-2W	White	
ACMIM-3B	Charcoal grey	AVE Sistema 45
ACMIM-3W	White	
ACMIM-4B	Charcoal grey	VIMAR Plana
ACMIM-4W	White	
ACMIM-5B	Charcoal grey	LEGRAND Vela Quadra / Vela Tonda
ACMIM-5W	White	
ACMIM-6B	Charcoal grey	BTICINO Axolute / Axolute Air
ACMIM-6W	White	
ACMIM-7B	Charcoal grey	VIMAR Eikon / Eykon EVO / Arkè
ACMIM-7W	White	

CODE	COLOUR	DOMESTIC RANGE
ACMIM-8B	Charcoal grey	GEWISS Chorus / Geo
ACMIM-8W	White	
ACMIM-9B	Charcoal grey	AVE Sistema 44 / Life 44 / Domus 100
ACMIM-9W	White	
ACMIM-10B	Charcoal grey	BTICINO Matix
ACMIM-10W	White	
ACMIM-11B	Charcoal grey	FEEL
ACMIM-11W	White	
ACMIM-12B	Charcoal grey	URMET Simon Nea
ACMIM-12W	White	
ACMIM-13B	Charcoal grey	ABB Mylos
ACMIM-13W	White	
ACMIM-14B	Charcoal grey	ABB Chiara
ACMIM-14W	White	

MODEL	MIM1000-ILan	MIM1000-IMod
Software	<ul style="list-style-type: none"> • Paso MIM1000 Control APP (iOS/Android/MAC/PC). • Configuration software for PC (WIN/MAC). 	-
Protocols	<ul style="list-style-type: none"> • Paso SOURCE1000. • ModBus (Paso MIM1000-iMOD). 	<ul style="list-style-type: none"> • EVAC (RJ45 LINK). • ModBus RTU (Monitoring).
Connections	<ul style="list-style-type: none"> • 2x RS485 (1x Bus SOURCE1000 - 1x Bus MIM1000-iMOD). • 1x RJ45 (LAN). • 1x 12-24 VDC power supply. 	<ul style="list-style-type: none"> • 1x RS485 (ModBus RTU). • 1x RJ45 (EVAC LINK). • 1x 12-24 VDC power supply.
Power supply	<ul style="list-style-type: none"> • 12-24 VDC with PS1000* external power unit (DIN). • Max. Absorbtion: 1,5A@5Vcc. 	<ul style="list-style-type: none"> • 12-24 VDC with PS1000* external power unit (DIN). • * not included
Environmental conditions	Operating temperature +5 to +55° C. / Relative humidity 5% to 95% (no condensation)	
Dimensions	53 x 91 x 62 mm (3 modules DIN bar)	36 x 91 x 62 mm (2 modules DIN bar)
Weight	0,25 kg	0,2 kg

APPLICATION DIAGRAM no. 1 | Multi-source PA system



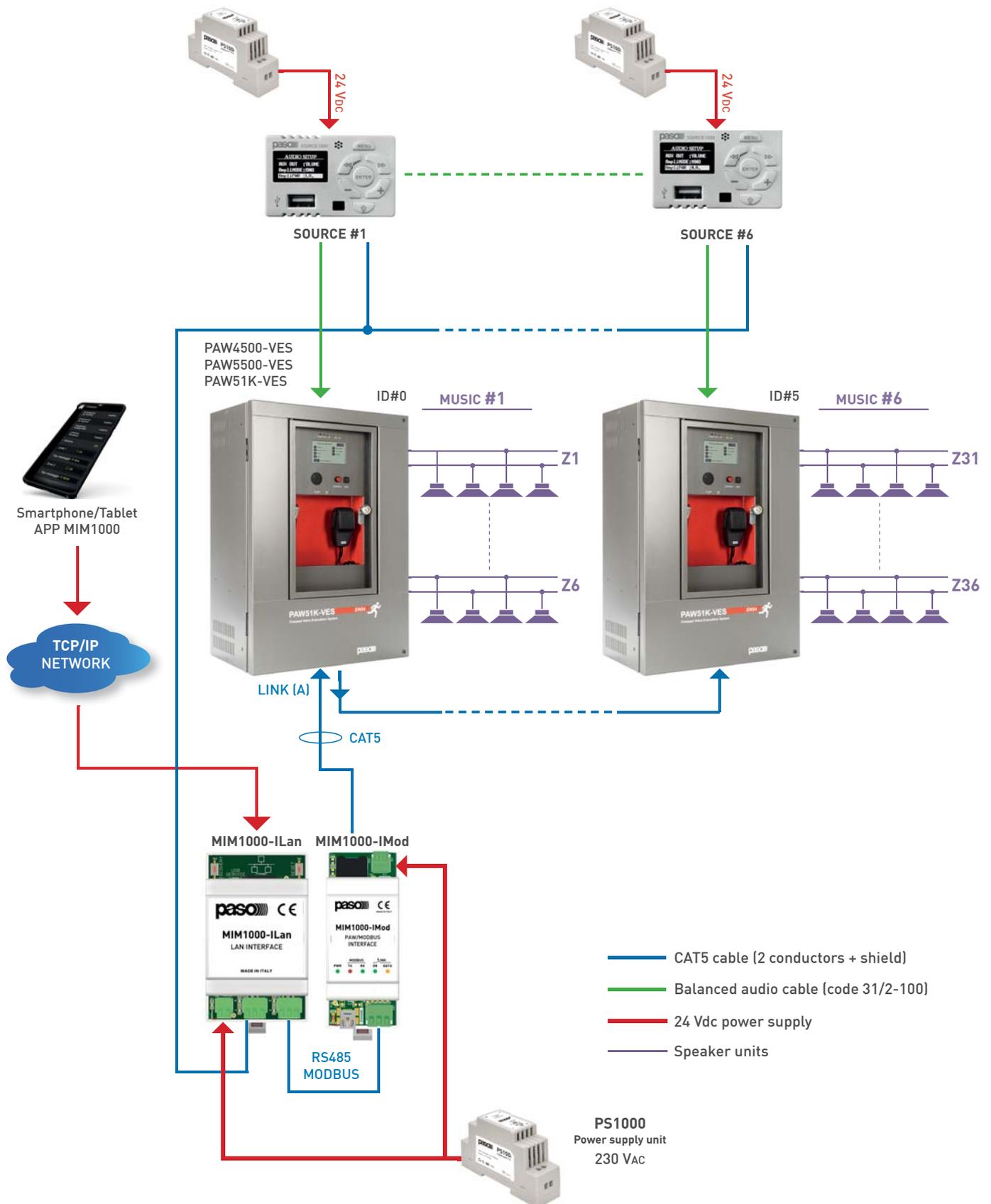
Ranges:
 AX3000
 AX6000
 PA1000
 PA6000

- CAT5 cable (2 conductors + shield)
- Balanced audio cable (code 31/2-100)
- 24 Vdc power supply
- Speaker units

Note
 All modules must be powered by a suitable **PS1000** 230Vac-24Vdc (0.55A) power supply unit.
 We recommend using one power supply for the **MIM1000-Imod** and **MIM1000-ILan** modules and one power supply for each **SOURCE1000** module installed.

APPLICATION DIAGRAM no. 2 | Type A voice evacuation system

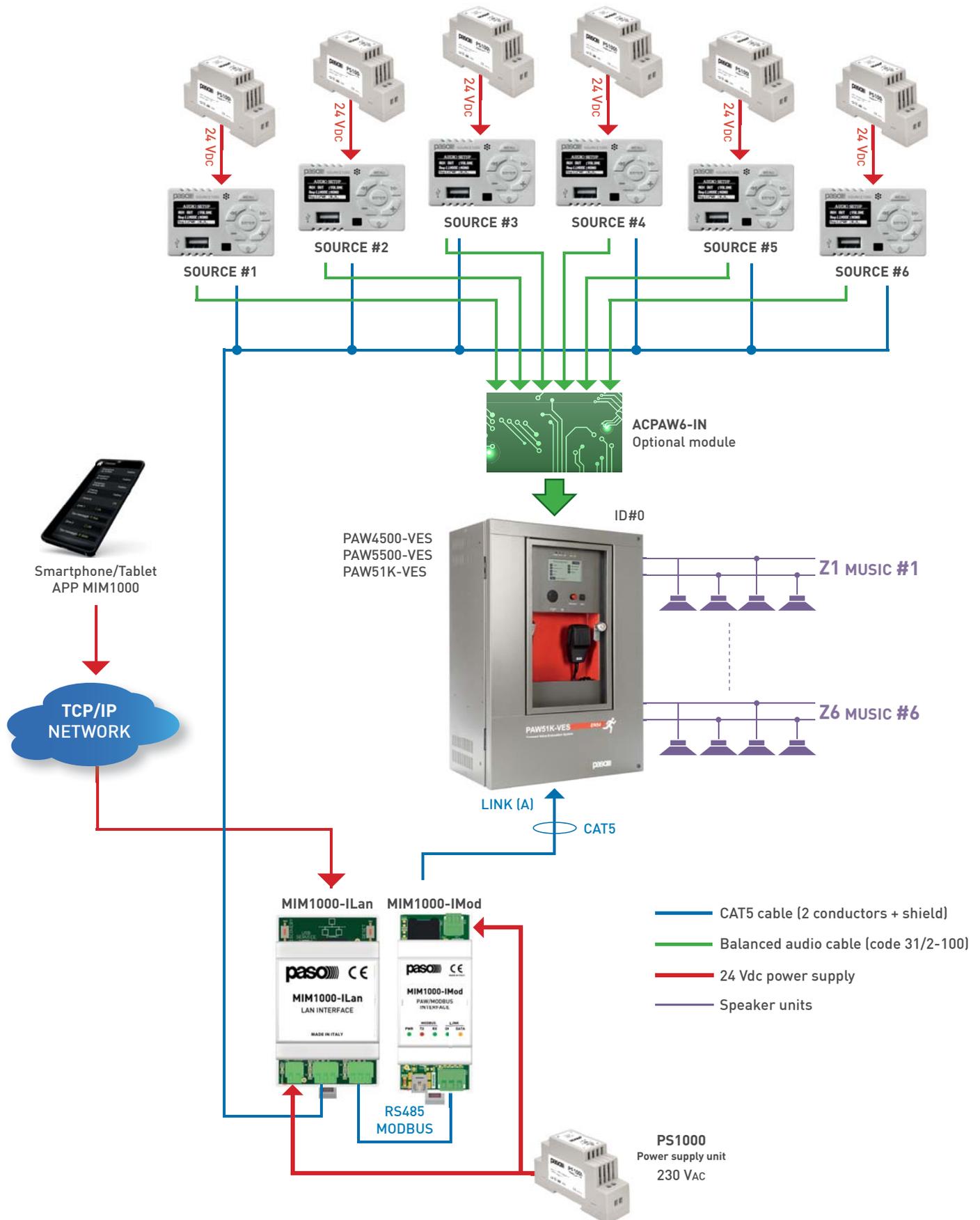
Multistation with a different sound source for each PAW



For the features of the compact systems in the PAW Series, refer to our catalogue dedicated to voice evacuation systems, *ENlarge your safety*, consulting the PAW Series | "ALL-IN-ONE Wall Systems" section.

APPLICATION DIAGRAM no. 3 | Type B voice evacuation system

Single-station with a different sound source for each area



For the features of the compact systems in the PAW Series, refer to our catalogue dedicated to voice evacuation systems, *ENlarge your safety*, consulting the PAW Series | "ALL-IN-ONE Wall Systems" section.



AW25



AW25-DIN
AW25R-DIN

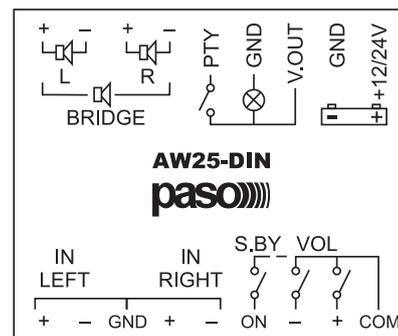
The ease of installation, the compact size and the high quality of these amplifiers make them particularly suitable for professional use for separate broadcasting of sound to small areas (e.g. TV signal in hotel rooms, booths of wellbeing centres, signals from video projectors/personal computers in meeting rooms) or for mobile applications such as amplification for market stalls, ships, buses, etc.

The models of the **AW25** range are high-efficiency Class D stereo amplifiers. They are small and compact but extraordinarily powerful thanks to the high-quality components with which they are made. They are capable of high performance levels in terms of signal dynamics. The basic **AW25** card can be installed directly inside electrical junction boxes or in false ceilings, while models **AW25-DIN** and **AW25R-DIN**, supplied with their own boxes, are suitable for installation on standard DIN guides. Contacts for remote volume control are provided, and if necessary it's possible to set operation simply as a booster unit (maximum volume on switching on). In this way, the output power will be determined by the level of the input power.

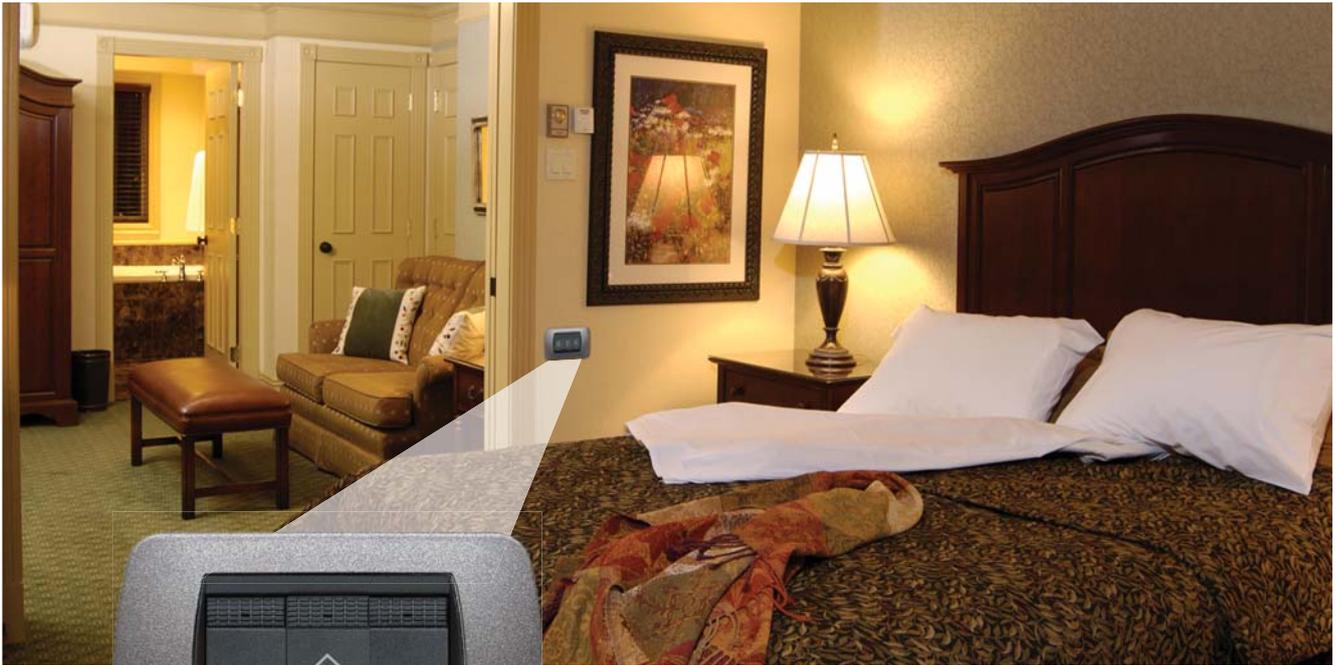


FUNCTIONAL FEATURES

- Class D stereo amplifier, 25 W maximum.
- High-efficiency.
- Small and compact sizes (**AW25** card version or **AW25-DIN** and **AW25R-DIN** models with box suitable for installation on standard DIN guides).
- Suitable for sound broadcasting to small areas (hotel rooms, booths of wellbeing centres, meeting rooms).
- 3 different operating modes: STEREO / BRIDGE / PA.
- Volume control simply by means of remote push-buttons.
- 12÷24 Vdc power supply.



Model **AW25R-DIN** has a trimmer-type volume control built into the internal circuit. This enables local adjustment of the volume of the two inputs, LEFT and RIGHT, in addition to any external volume controls.



An interesting feature of these models is that it is possible to control the volume simply by means of remote push-buttons (similar to common electrical UP/DOWN push-buttons), enabling all sorts of possible uses and making it easy to build them into systems. It is also possible to switch on the amplifiers from a remote station using a remote stand-by switch. A specific service output will enable activation of a signal confirming that they have switched on. These specifications, combined with the possibility of powering the amplifier from a source ranging from 12 to 24 Vdc, ensure excellent flexibility and versatility of installation.

OPERATING MODES

The unique feature of these amplifiers is that they can be used in three different modes, depending on requirements:

- **STEREO** | Amplifier with two stereo channels (L+R).
- **BRIDGE (mono)** | Amplifier with a single channel featuring a higher output power (bridge connection). If a stereo source is connected to them, the *Left* and *Right* inputs are mixed.
- **PA (mono)** | Amplifier with two independent channels, the first of which for background music and the second (priority) for calls, by activation from an external contact. The typical sound-broadcasting application for interrupting the background music, by means of a control, when a handsfree call is received.

MODEL	AW25, AW25-DIN, AW25R-DIN			
Operating mode	2 stereo channels		2 bridge channels (mono)	
Output power at 12 Vdc (D= 1%)	RL = 8 Ω + 8 Ω	1,5 + 1,5 W	RL = 8 Ω	6 W
	RL = 4 Ω + 4 Ω	2,5 + 2,5 W	RL = 4 Ω	10 W
Output power at 24 Vdc (D= 1%)	RL = 8 Ω + 8 Ω	7+7 W	RL = 8 Ω	25 W
	RL = 4 Ω + 4 Ω	11+11 W		
LINE input sensitivity (12 Vdc / 24 Vdc)	150 / 300 mV rms			
HIGH LEVEL input sensitivity	max 10 V rms			
S/N ratio @ 12 Vdc	> 80 dB			
S/N ratio @ 24 Vdc	> 85 dB			
Frequency response	60 ÷ 20.000 Hz (0 ÷ -3 dB)		40 ÷ 20.000 Hz (0 ÷ -3 dB)	
V.OUT output @ 12/24 Vdc	max 3W			
Power supply	11 Vdc (min) ÷ 28 Vdc (max)			
Maximum consumption @ 12/24 Vdc	1 A / 1,7 A			
Minimum consumption @ 12V/24 Vdc	60 mA / 70 mA			
Stand-by consumption	12 mA			
Dimensions (W x H x D)	AW25: 95 x 50 x 30 mm AW25-DIN and AW25R-DIN: 90 x 53 x 58 mm			

INTERPHONE SYSTEM FOR COUNTERS

Booth intercom for communication between rooms divided by glass or walls and in all structures where, for safety or hygiene reasons, it is necessary to maintain a separation between the two people speaking (ticket offices, bank counters, guard rooms, receptions, etc.).



The **ITC4000** is a device for communication between the operator and the public through the safety glass of the booth; the microprocessor operation provides a high level of quality and flexibility of performance. This system differs from other systems on the market thanks to its hands-free “HALF-DUPLEX TALK & LISTEN” operating mode, managed by a special algorithm entered in the microprocessor that allows for excellent switching speed between the operator channel and the public channel, preventing bothersome interruptions in communication or unwanted feedback (Larsen effect) whilst allowing the speakers to maintain a more natural conversation.

The operator’s station has a solid and sturdy ABS structure at its core, which is carefully designed and small in size (width ~12cm, depth ~20cm - less than half of an A4 sheet of paper, a feature that allows it to easily fit at workstations equipped with other electronic devices such as PCs, video terminals etc. without being cumbersome). It is equipped with a 35cm-long flexible-stem microphone with an electret microphone capsule and an on/off status LED.

The length of the stem and the electret capsule, which has an excellent level of sensitivity, allow for conversations with a natural tone and volume of voice, even from a slightly further distance: a crucial feature in applications where the operator must be able to move around freely to perform till transactions or input data on the video terminal. The station is completed by an integrated loudspeaker for listening and on/off and/or volume level adjustment buttons on both the operator side and

the public side. In addition to the “HALF-DUPLEX TALK & LISTEN” function, the intercom station also has a STANDBY function that allows the station to be deactivated after a certain period of inactivity (from 45 to 90 seconds), with the option of reactivating it automatically or manually. On the back of the operator station, there are two screw terminals for making connections to the power supply and the microphone and loudspeaker on the public side. Also on the back is a trimmer for configuration adjustments relating to the “HALF-DUPLEX” function.

For the listening function on the public side, the **ITC4000** system is completed by the aluminium **C401-B** loudspeaker, which is extremely robust and even suitable for anti-vandal applications (railway and underground stations, night pharmacies).

The ITC4000 intercom system consists of:

- Microphone unit, equipped with electret microphone on a flexible stem with a protective foam windscreen.
- External 230 Vac/12 Vdc 500mA power supply.
- Electret wall microphone, equipped with 3m-long shielded cable and designed to be installed on the glass of the booth thanks its double-sided anti-vibration adhesive layer.
- Screw terminals for power, microphone and loudspeaker connections on the public side.



P8136

P8236

This multizone system is particularly suitable for large and small installations in which particularly reliable, versatile and practical equipment is required.

The simplicity with which the various different units and the control bases can be connected to one another even when far away (CAT 5 connections) makes sound-broadcasting inside complex buildings effective and inexpensive, using both centralised and/or local control units.

Both the *Master* unit (**P8136**) and the *Slave* unit (**P8236**) enable management of up to six zones each. It is possible to activate/de-activate music for each zone using the front-panel switches provided for this purpose. The Master and Slave units can be used for switching both line signals (one amplifier for each zone) and the power signals (output from the amplifier, 100 V line). In this latter case, it is possible to connect two amplifiers (one for music and the other for speech, two-channel system) or a single voice/music amplifier (single-channel system). To increase the power being managed, the units have provisions for connecting two amplifiers for speech (3 zones each) and two for music. Depending on the size and configuration of the audio system, it is possible to use the Master and/or Slave units separately or connecting them to one another. The maximum system configuration envisages the use of 6 Master control units connected to 30 Slave units (five for each Master), thus managing up to 216 voice/music broadcasting zones. Up to 16 **PMB106-G** and/or **PMB112-G** microphone stations can be connected to each unit.

Unlike the Slave unit, on the P8136 there are four inputs for auxiliary sound sources with a selector switch and level control, two line inputs with automatic priority activation (VOX) and four RJ45 inputs for **PMB106-G** and/or **PMB112-G** call stations to be configured as Masters and able to control

all the zones in the system. The P8136 has provisions for inserting an optional **ACMG8136** card, needed for automatic and/or manual broadcasting of pre-recorded messages. **ACIO8136** cards can also be connected to the same lines as the "local" or "master" microphone stations. These are expansion cards with one balanced line input and 6+6 programmable input/output contacts and they can be used to send pre-recorded messages and/or the incoming audio signal to the various different zones in the system.

FUNCTIONAL FEATURES OF THE P8136 (MASTER)

- CAT 5 RJ45 inputs for:
 - **PMB106-G** and/or **PMB112-G** microphone stations configured as *Masters* (max. 4).
 - **PMB106-G** and/or **PMB112-G** microphone stations (max. 16).
 - **P8136** master unit (max. 5).
 - **P8236** slave unit (max. 5).
 - **ACIO8136** external I/O cards (max. 6).
- Configuration via software and USB link to a PC.
- Two VOX line inputs with automatic activation of priority (telephone/emergency audio inputs).
- Four music inputs (Tape, CD, Tuner, Aux).
- Line input from another Master unit (centralised BGM signal).
- Two separate 100-V inputs for voice and music signals.
- Six line-output zones split up into 2 groups of 3 each (100 V / 0 dB depending on how the system is configured).
- Voice and music audio outputs (0 dB).
- Music audio output (0 dB).
- Zone override connection (24 Vdc).
- **ACMG8136** pre-recorded message generating card (optional)
- Push-buttons for activating music in the six zones.
- Push-buttons and encoder for control and configuration.
- Power supply: 230 Vac/24 Vdc.



PMB range



FUNCTIONAL FEATURES OF THE P8236 (SLAVE)

- CAT 5 RJ45 inputs for:
 - PMB106-G and/or PMB112-G call stations (max. 16).
 - P8136 Master units (max. 1) / P8236 Slave units (max. 5).
 - ACIO8136 external I/O cards (max. 6).
- Local music input.
- Two separate 100-V inputs for voice and music signals.
- Six line-output zones split up into 2 groups of 3 (100V/0dB depending on how the system is configured).
- Voice and music audio output (0 dB).
- Zone override connection (24 Vdc).
- Push-buttons for activating music in the six zones.
- Power supply: 230 Vac/24 Vdc.



ACIO8136 | I/O card unit

- CAT5 master/slave unit connection
- 6 opto-insulated input contacts
- 6 output relay contacts
- 24 Vdc power supply
- 0 dB audio input
- Enable/disable VOX function (telephone/emergency audio input)
- 12 Vdc output



ACMG8136 | Message generator

- Optional P8136 master card unit
- SD memory card
- WAV message type
- 127 messages
- Microphone input
- Headphone output
- USB connector

MODEL	P8136	P8236
Mains power supply	230 Vca ± 10% - 50/60 Hz	230 Vca ± 10% - 50/60 Hz
Vdc external power supply	24 Vdc	24 Vdc
Mains consumption	30 VA	30 VA
Vdc consumption	1,5 A	1,5 A
Maximum power switchable for single zone	500 W (@ 100 V)	500 W (@ 100 V)
19" rack mounting (modular units)	Direct (2U)	Direct (1U)
Dimensions (W x H x D)	482 x 88 x 167 mm	482 x 44 x 143 mm
Weight	3,9 kg	2 kg



The **P8036** model enables up to six zones to be selected from a microphone base. It is possible to activate/de-activate music for each zone by means of the front-panel switches.

It can be used both with line signals (upstream from the amplifier) and with power signals (output from the 100 V line amplifier). The P8036 has provisions for connecting two amplifiers (one for music and one for speech) to it or it can be configured for operation with a single amplifier for both voice and music. It has 4 inputs for auxiliary sound sources with a selector switch and level control, an input on a terminal board for connecting several microphone stations (B711-G and/or B711/6-G) and a VOX priority input for sound sources such as a message or alarm-tone generator.

The selected music signal, with a controlled amplitude, will be available on the MUSIC OUT output, while the voice signal from the base or from the VOX input (depending on the priority) will be available on the MIX OUT output. If there is only one amplifier, the music featuring the lowest priority level may also be available on that input.

FUNCTIONAL FEATURES

- Selection of voice/music on six zones via relay
- Possibility of activating/de-activating music for each zone by means of front-panel switches
- Four inputs for music sources
- VOX line input with automatic activation of precedence and All Call
- Input for B711 range pre-amplified microphone bases on a screw-down terminal block
- Separate 100-V inputs for music and speech
- Selection of Base/VOX or VOX/Base priority
- Six zone-line outputs on screw-down terminal block with three-wire connection for overriding the local volume attenuators
- MUSIC OUT and MIX OUT outputs
- Service relay for special types of activation (pre-recorded messages, alarm tone, etc.).
- Can be mounted in a 19" rack, height: 1 module
- Power supply: 230 Vac/24 Vdc

MODEL	P8036			
Power supply (max consumption)	230 Vac ±10% - 50/60 Hz (18 W) / 24 Vdc (0,8 A)			
Max power switchable for single zone	500 W (@ 100 V)			
Service relays (12V coil)	Vmax = 35 V / Imax = 5 A			
Microphone stations	Preamplified B711-G and B711/6-G (max 5)			
Selectable inputs	CD	TAPE	TUNER	AUX
Type	Unbalanced, double RCA			
Sensitivity/Impedance	480 mV / 45 kΩ		100 mV / 33 kΩ	
S/N ratio	> 80 dB			
Frequency response @ -3dB	25 ÷ 20.000 Hz			
BASE INPUT input	Unbalanced, with terminals			
Sensitivity/Impedance	190 mV / 10 kΩ			
S/N ratio	85 dB			
Frequency response @ -3dB	50 ÷ 20.000 Hz			
VOX IN input	Unbalanced, RCA			
Sensitivity/Impedance	300 mV / 46 kΩ			
S/N ratio	85 dB			
Frequency response @ -3dB	30 ÷ 20.000 Hz			
Tripping threshold VOX	~30 mV			
Output	MIX. OUT	MUSIC OUT		
Type	Unbalanced, RCA			
Level/Impedance	775 mV / 100 Ω	775 mV / 600 Ω		
19" rack mounting (modular units)	Direct (1 U)			
Dimensions (W x H x D) / Weight	482 x 44 x 233 mm / 3,6 kg			

MICROPHONE STATIONS AND CONNECTIONS

It is possible to use **B711-G** (All-Call) and/or **B711/6-G** (zone calls) pre-amplified microphone bases, both of which have RJ45 sockets for direct SFTP CAT5 shielded cables (AUDIO IN / AUDIO OUT).

B711/6-G stations also have ZONE 1 to 6 sockets for controlling the zone-switching relays. The connectors must be shielded RJ45 connectors. On the **P8136**, on the other hand, there are two removable bayonet-type terminal blocks for connections: one for the audio and the precedence control ('BASE INPUT') and the other for selecting the zones to be called ('ZONE SELECT').



RJ45	B711-G B711/6-G	P8036 connections	B711/6-G	P8036 connections
PIN	AUDIO IN/OUT	BASE INPUT	ZONE 1÷6	ZONE SELECT
1	Audio +	AF	Zone 1	Zone 1
2	Audio -	-	Zone 2	Zone 2
3	GND	GND signal	Zone 3	Zone 3
4	Priority	Priority	Zone 4	Zone 4
5	N.C.	-	Zone 5	Zone 5
6	+Vdc	+ 12 Vdc	+ Vdc	+ Vdc
7	Serial +	-	Zone 6	Zone 6
8	Serial -	-	GND	-
Shield	GND	GND signal	GND	-

MIXER AMPLIFIERS BOOSTER UNITS

The functional nature and versatility of PASO amplifiers are the outcome of many years of experience with these systems.





This range of built-in amplifiers is characterised by its versatility, user-friendliness, robustness and reliability, designed for a vast range of applications in the field of sound-broadcasting for both commercial and industrial use. The numerous functions offered by the AX6000 range include three output lines (to zones), CAT5 links to the microphone stations for calling the zones, priority emergency calls to single zones or groups of zones and provisions for a USB/SD card music module.

The internal CPU is easily able to manage all the many functions of the equipment and the micro-switches on the rear panel can be used to select the required operating model. All the models have 5 inputs with independent front-panel controls and professional XLR connectors equipped with mechanical locking hold-down devices. The first two are of the electronically balanced microphone type, with a phantom power supply (input 1 with automatic VOX activation).

The third can be used either as a microphone input or as an input for PMB106-G microphone stations (RJ45 connector) with the possibility of making calls to zone. The last two can be configured separately, as microphone inputs (with or without phantom power supplies) or as line inputs. There are two auxiliary inputs (CD and TAPE) for connecting sources of music, with normalised input levels and a double RCA socket for using standard stereo cables.

There is a special Telephone/Emergency audio input with automatic activation (VOX) that can be used for a priority call. If the system requires acoustic correction, it is possible to connect any equalizer whatsoever or a device for preventing acoustic feedback (Larsen effect) to the PRE OUT and PWR IN sockets after positioning the control switch provided for this purpose.

The front panel has a compartment for housing an optional AC6000 module, enabling external devices such as SD/MMC cards and USB storage units used as sources of music to be played. All the amplifiers of the range ensure a high degree of reliability thanks to electronic devices protecting them from overload currents and over-temperatures of the power devices. Each unit also has a cooling fan, with automatic control of the speed depending on the temperature.

CARATTERISTICHE FUNZIONALI

- 2 balanced/unbalanced mic inputs with Phantom power supply.
- Microphone input or PMB microphone stations.
- 2 MIC/PH/LINE inputs with specific selector switch.
- 2 auxiliary inputs for sound sources (TAPE/CD).
- Telephone/emergency audio input for priority calls with adjustable threshold and sensitivity.
- Front-panel adjustment of the level of each microphone and auxiliary input.
- Front-panel control of overall volume and of treble and bass tones.
- Provisions for inserting a USB/SD CARD module (AC6000).
- Constant voltage (50/70/100 V) or 8 Ω impedance loudspeaker line output.
- 3 output lines for zones.
- Balanced line output for connection to other amplifiers.
- Output/input for connection to audio processors.
- LED-type Vu meter for clear and quick reading of power emitted.
- Micro-switches for setting operating modes.
- Includable/excludable speech filters on all microphone inputs.
- Contacts for activating input precedence and override.
- "Music On Hold" output with output level control (output of the selected auxiliary signal).
- Alerting signal (chime) with level control.
- Front-panel keys for selecting music listening zones.
- Power supply: 230/115 Vac and 24 Vdc.

CONFIGURATION MICRO-SWITCHES

The main feature of the AX6000 range is the presence of micro-switches on the rear panel enabling the settings of all the operational parameters of the equipment to be checked and/or changed. Specifically, it is possible to manage priorities among the various different audio inputs, to enable a warning signal, to enable VOX (automatic activation) of the MIC1 input and to programme the zones for calls by means of a precedence contact and from the telephone/emergency input.

TELEPHONE/EMERGENCY INPUT

There is a special audio input (TEL/EMERG) on the rear terminal block, balanced with a transformer and with automatic activation of precedence (VOX). Controls for adjusting the level and the activation threshold are provided on the rear panel. This input can be used for connecting the appropriate audio output of a telephone switchboard.



BACKGROUND MUSIC

This equipment enables activation/de-activation of BACKGROUND MUSIC in the chosen zone by means of the switches provided for this purpose on the front panel. The appropriate LED will light up to confirm that the music has been activated in the zone in question.



MICROPHONE STATIONS CONNECTION

With the amplifiers of the AX6000 range, connecting a **PMB106-G** microphone station, so as to enable messages to be sent to one or more receiving zones is simple and quickly done. It is essential to use SFTP CAT.5E shielded cables (IN UNITS input), and it is possible to connect up to 16 stations in cascade fashion over a maximum distance of up to 1 km. If necessary, the bases can be powered by means of their rear-panel sockets. The output level is adjustable by means of the appropriate front-panel control (MIC/UNITS).

AC6000

USB/SD CARD MODULE FOR AX6000 RANGE, WITH REMOTE CONTROL

Each amplifier of the AX6000 range has a compartment for housing an optional module enabling an external device such as an SD/MMC card or a USB storage unit to be played. The player has a display for indicating the presence/lack of a SD/MMC/USB medium, the chosen functions and information about the tracks. A remote control unit is also provided with the module.



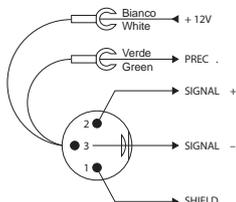
FUNCTIONAL FEATURES

- Keys for normal control of how the tracks are played out (PLAY/PAUSE, PREV, NEXT, STOP).
- RANDOM function for playing out the tracks at random.
- REPEAT function for playing out one or more pieces of choice.
- PROGRAM function for playing out a pre-set sequence of pieces of music.

CONNECTIONS

Microphone precedence and warning signal

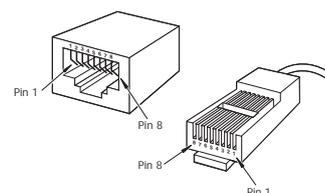
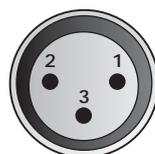
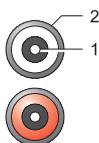
When the precedence contacts (PR and +12V) on the rear terminal block are closed, all the inputs except for MIC.1 and TEL./EMERG are muted (it is in any case possible to use the micro-switches to programme the inputs to be muted and priority of the precedence contact). Closing the contact generates a two-tone warning signal (CHIME).



Auxiliary inputs (RCA)

UNBALANCED connection

- 1 Signal
- 2 Shield and GND



Microphone inputs (XLR)

BALANCED connection

- 1 Shield
- 2 Signal (hot side)
- 3 Signal (cold side)

UNBALANCED connection

- 1 Shield and GND
- 2 Signal
- 3 Shield and GND

UNITS input (RJ45)

Pin	Description
1	Audio +
2	Audio -
3	GND
4	Not connected
5	Not connected
6	+ Vdc
7	Serial +
8	Serial -
Shield	GND

MODEL	AX6120	AX6240
Rated power output	120 W	240 W
Constant voltage outputs / Low impedance outputs	100-70-50 V and 8 Ω	
Tones control	Bass ± 10 dB (100 Hz) ; Treble ± 10 dB (10 kHz)	
Microphone inputs MIC.1 and MIC.2	2 balanced XLR (phantom supply 17,5 V), MIC1 with activation threshold (A.P.T.)	
Sensitivity/Impedance	1,2 mV / 1300 Ω	
S/N ratio	> 66 dB	
Frequency response	40 ÷ 19.000 Hz	
Microphone input (MIC.3 / UNITS)	Balanced XLR (phantom supply 17,5 V) / 1 RJ45 (for PMB106-G microphone station)	
Sensitivity/Impedance	MIC.: 1,2 mV / 1,5 kΩ ; UNITS: 900 mV / 47 kΩ	
S/N ratio	MIC.: > 66 dB ; UNITS: > 71 dB	
Frequency response	MIC.: 40 ÷ 19.000 Hz – UNITS: 60 ÷ 15.000 Hz	
Maximum number of microphone station units (PMB106-G)	Up to 16 stations in cascade fashion over a maximum distance of up to 1 km; if necessary, the bases can be powered by means of their rear-panel sockets	
Microphone/Line inputs (MIC / LINE 4 and 5)	2 balanced XLR with Phantom/Mic/Line selection	
Sensitivity/Impedance	MIC: 1,3 mV / 1300 Ω ; LINE: 140 mV / 130 kΩ	
S/N ratio	MIC: > 66 dB ; LINE: > 75 dB	
Frequency response	MIC: 35 ÷ 17.000 Hz ; LINE: 30 ÷ 20.000 Hz	
Auxiliary inputs	2 RCA (CD + TAPE)	
Sensitivity/Impedance	CD: 600 mV / 35 kΩ ; TAPE: 300 mV / 18 kΩ	
S/N ratio	> 80 dB	
Frequency response	30 ÷ 20.000 Hz	
Telephone / Emergency (TEL / EMERG) audio input	Balanced with terminals (HOT-COM-GND) w/activation threshold adjustment	
Sensitivity/Impedance	120 mV / 5,5 kΩ	
S/N ratio	> 80 dB	
Frequency response	250 ÷ 20.000 Hz	
Line signal outputs	5	
LINE OUT	XLR balanced 1,3 V / 4 kΩ	
PRE OUT	1 RCA 1 V / 3,7 kΩ	
TAPE OUT	2 RCA 1,2 V / 2 kΩ	
Music On Hold (MOH) PRE-AMPLIFIED LINE	Terminals (HOT-COM) 2,6 V - 300 Ω	
Music On Hold (MOH) AMPLIFIED LINE	Terminals (GND-MON) 1 W – 8 Ω	
Power supply	230/115 Vac - 50/60 Hz / 24 Vdc	
Maximum consumption	280 W (325 VA)	530 W (600 VA)
Current consumption @24 Vdc (max. power / no signal)	6,9 A / 0,3 A	13 A / 0,3 A
19" rack mounting (modular units)	Optional AC5660 brackets with recommended AC50 supports (2U)	
Dimensions (W x H x D)	432 x 88 x 360 mm	
Weight	9,5 kg	11,8 kg



Models of the AX3500 range have excellent functional features and stand out for their exceptionally good price/performance ratios.

The **AX3504** 40 W amplifier is the basic model of the AX3500 range. It is particularly suitable for small systems, and features great flexibility of use thanks to the large variety of inputs and outputs: two microphone inputs (one on the front panel with VOX priority, handy and simple to use), two auxiliary inputs for sound sources (Tape, CD) that can be selected by means of a front-panel control and an audio input with automatic activation of precedence (VOX). A precedence contact activates priority of the microphone over the auxiliary sources, sending a warning signal (chime) at the same time. This unit can be mounted on a standard 19" rack using the specific **AC3504** brackets.

The wide range of possible configurations of the **AX3506** (60 W) and **AX3512** (120 W) makes each of them a versatile unit able to meet the needs of any small or medium-sized system.

Three balanced microphone inputs with phantom power supplies plus an input for **B711-G** microphone stations.

There are two auxiliary inputs for sources of sound (Tape, CD) that can be selected by means of the front-panel control. On the rear terminal block there is an audio input with automatic activation of precedence (VOX); the level and activation threshold can be adjusted via the rear panel. This input can be used for connecting the appropriate audio output of a telephone switchboard.

The precedence contact can be used to activate priority of the microphones over the auxiliary sources, sending a warning signal (chime) at the same time.

A VU-meter on the front panel indicates clearly the power being output and any overloads. Each amplifier has electronic protection against short circuits on the loudspeaker line.

These units can be mounted on a standard 19" rack using the specific **AC3500** brackets.

FUNCTIONAL FEATURES OF AX3504

- Microphone input (jack 1/4"). Input with automatic precedence function (VOX) and threshold adjustment.
- Microphone input with phantom power supply (XLR).
- 2 auxiliary inputs for sound sources (TAPE/CD).
- Telephone/emergency audio input for priority calls with adjustable threshold and sensitivity.
- Front-panel level control for each microphone and auxiliary input.
- Front-panel treble and bass controls.
- Constant voltage (50/70/100 V) or 8 Ω impedance loudspeaker line output.
- Auxiliary line output.
- Contacts for activating precedence on line input.
- Alerting signal (chime) with level control.
- Selectable 230/115 Vac and 24 Vdc mains power supply.



...AND PLUS, ON MODELS AX3506 AND AX3512

- Mic input (XLR) with phantom power supply or RJ45 to connect **B711-G** microphone stations.
- MIC/PH/LINE input with associated selector switch.
- LED-type Vu meter for immediate monitoring of output power.
- Micro-switches for setting priorities and input functions.
- Inclusion/exclusion of speech filter on all microphone inputs.



MODEL	AX3504
Rated power output	40 W
Constant voltage outputs / Low impedance outputs	100-70-50 V / 8 Ω
Tones control	Bass ± 10 dB (100 Hz) ; Treble ± 10 dB (10 kHz)
Microphone inputs (MIC.1 and MIC.2)	2 balanced (MIC1: Jack 6,5 mm, no phantom - MIC2: XLR with phantom 16,5 V)
Sensitivity/Impedance	1 mV / 1300 Ω
S/N ratio	MIC.1 > 64 dB; MIC.2: > 61 dB
Frequency response	35 ÷ 20.000 Hz
Auxiliary inputs	2 unbalanced RCA (CD, TAPE)
Sensitivity	520 mV (CD) – 250 mV (TAPE)
S/N ratio	> 73 dB
Frequency response	30 ÷ 20.000 Hz
Telephone / Emergency (TEL / EMERG) audio input	Balanced with terminals (HOT-COM-GND)
Sensitivity/Impedance	150 mV / 6 kΩ
S/N ratio	> 73 dB
Frequency response	170 ÷ 12000 Hz
Line signal outputs	Unbalanced, RCA
LINE OUT	800 mV / 100 Ω
Power supply	230/115 Vac - 50/60 Hz / 24 Vdc
Maximum consumption	100 W (117 VA)
24 Vdc current consumption (max power / with no signal)	2,8 A / 0,1 A
19" rack mounting (modular units)	Optional AC3504 brackets (2U)
Dimensions (W x H x D)	275 x 88 x 230 mm
Weight	4,2 kg

MODEL	AX3506	AX3512
Rated power output	60 W	120 W
Constant voltage outputs / Low impedance outputs	100-70-50 V / 8 Ω	
Tones control	Bass ± 10 dB (100 Hz) ; Treble ± 10 dB (10 kHz)	
Microphone inputs (MIC.1 and MIC.2)	2 balanced, XLR (phantom power supply 17,5 V), MIC1 with activation threshold (A.P.T.)	
Sensitivity/Impedance	0,9 mV / 900 Ω	
S/N ratio	> 62 dB	
Frequency response	40 ÷ 20.000 Hz	
Microphone input (MIC3 / UNITS)	Balanced, XLR (phantom power supply 17,5 V) / 1 RJ45 (for B711-G microphone stations)	
Sensitivity/Impedance	MIC.: 0,9 mV / 900 Ω - UNITS: 290 mV / 700 kΩ	
S/N ratio	MIC.: > 62 dB – UNITS: > 65 dB	
Frequency response	40 ÷ 20.000 Hz	
Maximum number of microphone station units (B711-G)	Up to 6 microphone stations in cascade fashion over a maximum distance of up 200 m	
Microphone / Line input (MIC / LINE 4)	Balanced, XLR with Phantom/Mic/Line selection	
Sensitivity/Impedance (MIC / LINE 4)	MIC: 0,9 mV / 900 Ω - LINE: 90 mV / 50 kΩ	
S/N ratio MIC / LINE 4	MIC: > 62 dB – LINE: > 70 dB	
Frequency response MIC / LINE 4	40 ÷ 20.000 Hz	
Auxiliary inputs	2 balanced, RCA (CD, TAPE)	
Sensitivity	450 mV (CD) – 230 mV (TAPE)	
S/N ratio	> 70 dB	
Frequency response	35 ÷ 20.000 Hz	
Telephone / Emergency (TEL / EMERG) audio input	Balanced with terminals (HOT-COM-GND) w/activation threshold adjustment	
Sensitivity/Impedance	150 mV / 6 kΩ	
S/N ratio	> 72 dB	
Frequency response	250 ÷ 17.000 Hz	
Line signal outputs	Unbalanced, RCA	
LINE OUT	900 mV / 100 Ω	
Power supply	230/115 Vca - 50/60 Hz / 24 Vcc	
Maximum consumption	130 W (150 VA)	270 W (320 VA)
24 Vdc current consumption (max power / with no signal)	3,4 A / 0,1 A	6,7 A / 0,2 A
19" rack mounting (modular units)	Optional AC3500 brackets (2U)	
Dimensions (W x H x D)	430 x 88 x 234 mm	
Weight	6,5 kg	9 kg



AW5612
120 W

AW5624 
240 W

AW5648 
480 W

The **AW5600** range of booster units is specifically designed for professional sound-broadcasting systems with service and emergency messages. Thanks to the great reliability of the protection circuits used, combined with an attractive appearance and very tough structures, these units are ideal products for quality amplification, with an interesting price/performance ratio.

Each amplifier of the **AW5600** range has an electronically balanced line input/output with a double XLR socket, one female socket and one male socket to facilitate connection of a number of boosters in cascade fashion. To connect a source of sound directly, it is possible to use a second unbalanced input by means of a double RCA socket for using standard stereo cables.

All the boosters of this range have an RJ45 input for connection to **B711-G** pre-amplified microphone bases simply by means of SFTP CAT.5E shielded cables.

There is a special balanced input (**TEL/EMERG**) with a transformer and automatic activation of precedence (**VOX**) on the rear panel.

Controls for adjusting the level and the activation threshold are present on the rear panel. This input can be used for connecting the appropriate audio output of a telephone switchboard.

The **AW5600** range has a large number of devices for protection against overloads and short circuits (an output current peak-limiting circuit, a thermal circuit-breaker inside the power transformer, a resettable thermal circuit-breaker in contact with the power-transistor heat sink, mains fuses).

In addition, each unit has a cooling fan, with automatic control of the speed depending on the temperatures of the heat sinks to which the power devices are applied.

FUNCTIONAL FEATURES

- Balanced line input/output (XLR-F and XLR-M sockets, with adjustable sensitivity).
- Unbalanced line input (double RCA socket).
- B711-G microphone station input (RJ45 socket).
- Telephone/emergency audio input for priority calls with adjustable threshold and sensitivity.
- Front panel overall volume control and treble and bass controls.
- Rear-panel selector switch for enabling/disabling front-panel tone and volume controls.
- Constant voltage (50/70/100 V) or 8Ω impedance loudspeaker line output.
- LED-type Vu meter for clear and immediate monitoring of output power.
- Contacts for activating precedence on line input.
- Alerting signal (chime) with level control.
- Selectable 230/115 Vac and 24 Vdc mains power supply.



The following models are certified for use in voice evacuation systems:

- **AW5624** Cert. EN54-16:2008 no. 0068/CPR/082-2013
- **AW5648** Cert. EN54-16:2008 no. 0068/CPR/082-2013

FRONT PANEL CONTROL EXCLUSION

If this amplifier is used in emergency systems, it is possible to disable all the front-panel controls (tone and volume controls). In this way it is possible to prevent the levels set at the time of commissioning the system from being accidentally altered (NORM/DIRECT rear switch). The **AW5624** and **AW5648** models are fully compliant and certified under EN 54-16: 2008.

TELEPHONE/EMERGENCY INPUT

There is a special audio input (TEL/EMERG) on the rear terminal block, balanced with a transformer and with automatic activation of precedence (VOX). Controls for adjusting the level and the activation threshold are provided on the rear panel. This input can be used for connecting the appropriate audio output of a telephone switchboard.



MICROPHONE STATIONS CONNECTION

B711-G microphone stations can be used simply and rapidly with the amplifiers of the **AW5600** range. It is essential to use CAT5e SF/UTP shielded cables (IN input UNITS), and it is possible to connect up to 6 microphone stations in cascade fashion. The output level can be adjusted by means of the appropriate rear-panel control (LEV).

MODEL	AW5612	AW5624	AW5648
Rated power output	120 W	240 W	480 W
Constant voltage outputs / Low impedance outputs	100-70-50 V / 8 Ω		
Tones control	Bass ± 10 dB (100 Hz) ; Treble ± 10 dB (10 kHz)		
Microphone input UNITS	RJ45 (for B711-G microphone units)		
Sensitivity/Impedance	1250 mV		320 mV
S/N Ratio		> 78 dB	
Frequency response		30 ÷ 20.000 Hz	
Maximum number of microphone station units (B711-G)	Up to 6 microphone stations in cascade fashion over a maximum distance of up 200 m		
Line input	Balanced XLR, unbalanced RCA		
Sensitivity/Impedance	300 mV / 60 kΩ		
S/N Ratio	>77 dB		
Frequency response	30 ÷ 20.000 Hz		
Telephone / Emergency (TEL / EMERG) audio input	Balanced with terminals (HOT-COM-GND) with activation threshold adjustment		
Sensitivity/Impedance	120 mV / 6 kΩ		
S/N Ratio	>75 dB		
Frequency response	230 ÷ 13.000 Hz		
Line output (LINEA OUT)	Balanced, XLR		
Power supply	230/115 Vac - 50/60 Hz / 24 Vdc		
Maximum consumption	280 W (320 VA)	535 W (610 VA)	1160 W (1330 VA)
24 Vdc current consumption (max power / with no signal)	6,6 A / 0,2 A	13,2 A / 0,2 A	33 A / 0,8 A
19" rack mounting (modular units)	Optional AC5660 brackets with recommended AC50 supports (2U)		
Dimensions (W x H x D)	432 x 88 x 272 mm		432 x 88 x 360 mm
Weight	8,2 kg	10,5 kg	16 kg



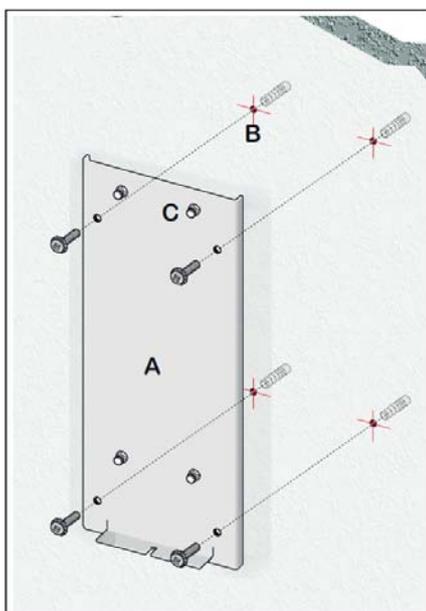
The peculiarity of these amplifiers is that they are able to withstand high voltages between the mains power supply/loudspeaker outputs and the frame, even reaching up to 4 kV. This feature increases the safety of the system, preventing possible discharges on the mains or on the loudspeakers connections from passing along the audio chain thus causing serious damage or personal injury.

- AXF120-HV** 120 W RMS mixer amplifier, 4 kV insulation
- AXF240-HV** 240 W RMS mixer amplifier, 4 kV insulation
- AWF120-HV** 120 W RMS booster unit, 4 kV insulation
- AWF240-HV** 240 W RMS booster unit, 4 kV insulation

The input of the amplifier is electronically balanced. For special needs, for example in case of particularly long connecting lines or lines prone to interference, it is possible to isolate the input galvanically by means of an optional **TM92** card equipped with a line transformer.

Each amplifier is equipped with a diagnostics card able to provide a high number of additional functions (line impedance measurements, amplifier diagnostics, check of integrity of the loudspeaker line, volume control, selection of two inputs, failure-signalling relay control, possibility of including a 'LOW CUT' filter, operation in the 'LOW POWER' energy-saving mode). In addition to all the operations and/or checks set locally by means of the micro-switches, it will also be possible to alter all the parameters via the RS485 serial interface.

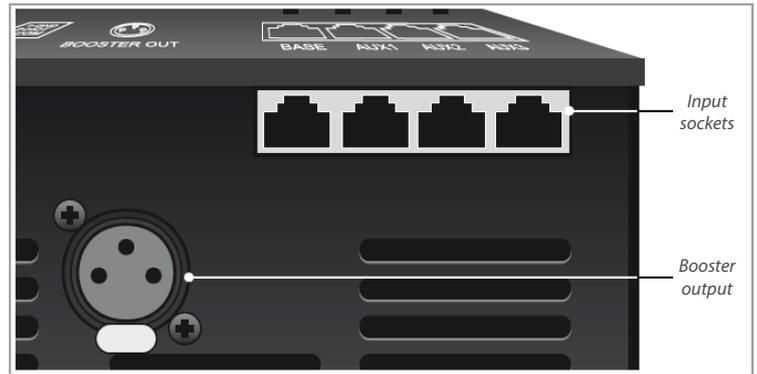
This built-in amplifier has a standard format that enables it to be mounted also inside telephone type cabinets. The fact that it can be directly wall-mounted using the special backplate enables it to be used in all situations in which there is little room available.



Models **AXF120-HV** and **AXF240-HV** have four inputs with RJ45 sockets on the lower panel: one input for a **B711-G** microphone station (BASE) and three auxiliary inputs (AUX1, AUX2 and AUX3).

These inputs, which are electronically balanced, are switched to one another and have their own order of priority: the BASE input has priority over inputs AUX1/2/3, input AUX1 over AUX2/3 and input AUX2 over AUX3.

On each of them, switching of the inputs takes place by means of a positive power supply from outside. There is a voltage on sockets AUX1/2/3 that is cut off in the event of failure of the amplifier or if it is switched off. This enables operation of the amplifier to be monitored from a remote station. There is a 'busy' signal on sockets AUX 2 and AUX 3 when the BASE input or the AUX 1 input are active.

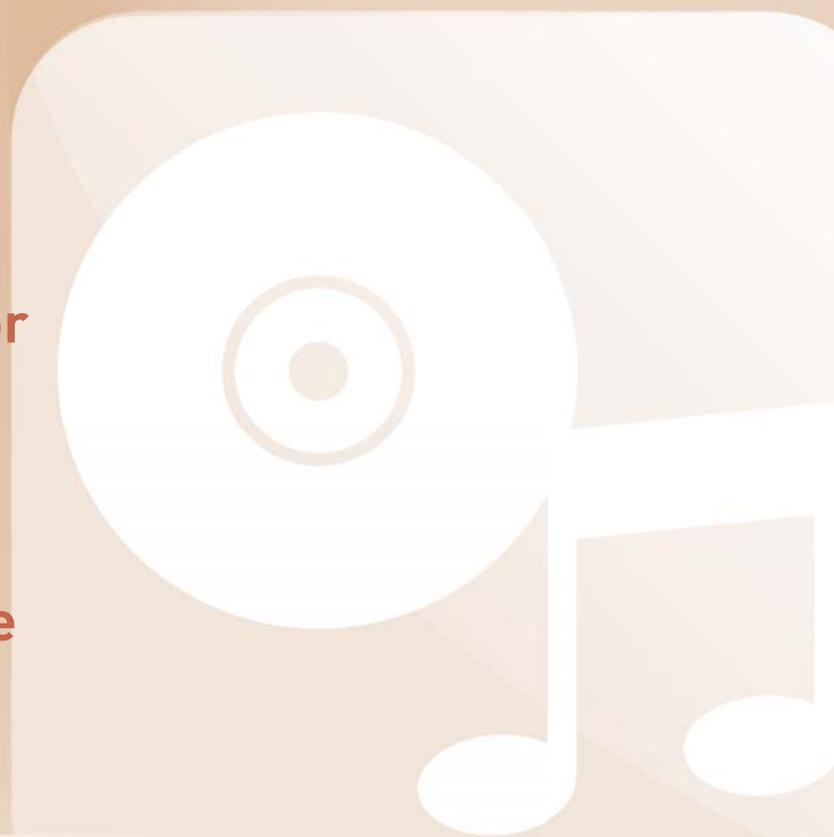


MODEL	AWF120-HV	AWF240-HV
Rated power output @230Vac	120 W	240 W
Rated power output @24Vdc	90 W	150 W
Constant voltage outputs / Low impedance outputs	100-70-50 V / 8-4 Ω	
Distortion at rated power	< 1 %	
Remote control	Serial RS485	
Inputs	Balanced, XLR	
Sensitivity	770 mV	
S/N Ratio	> 90 dB	
Frequency response	40 ÷ 30.000 Hz	
Secondary input	Balanced with terminals	
Sensitivity	720 mV	
Frequency response	50 ÷ 18.000 Hz	
Distortion	< 0,5%	
Power supply	230 Vac - 50/60 Hz / 24 Vcc	
Maximum consumption	250 W / 300 VA	500 W / 600 VA
24 Vdc current consumption (max power)	6,5 A	11 A
Dimensions (W x H x D)	150 x 368 x 150 mm	
Weight	7,4 kg	10,7 kg

MODEL	AXF120-HV	AXF240-HV		
Rated power output @230Vac	120 W	240 W		
Rated power output @24Vdc	90 W	150 W		
Constant voltage outputs / Low impedance outputs	100-70-50 V / 8-4 Ω			
Distortion at rated power	< 1 %			
Remote control	Serial RS485			
Inputs	BASE	AUX1	AUX2	AUX3
Sensitivity	400 mV	260 mV		
S/N Ratio	> 85 dB			
Frequency response	60 ÷ 19.000 Hz			
Secondary input	Balanced with terminals			
Sensitivity	720 mV			
S/N Ratio	50 ÷ 18.000 Hz			
Frequency response	< 0,5%			
Power supply	230 Vac - 50/60 Hz			
Maximum consumption	250 W / 300 VA	500 W / 600 VA		
24 Vdc current consumption (max power)	6,5 A	11 A		
Dimensions (W x H x D)	150 x 365 x 150 mm			
Weight	7,4 kg	10,7 kg		

CMDS SYSTEMS, PROCESSORS AND SOUND SOURCES

PASO compact systems, sound sources and mixers provide many possible solutions for broadcasting music and messages able to meet any needs in the most appropriate and effective manner.





The **PA6000** compact systems combine in a single container a multi-function sound source (CD-MP3 player, USB, SD/MMC card and AM/FM tuner) and an amplifier-mixer, 120 W and 240 W RMS respectively, with six output zones and separate volume control.

They have an internal CPU able to manage easily the many functions of the equipment. Specific micro-switches on the rear enable the desired operating mode to be selected. Designed starting out from the amplifier-mixers of the **AX6000** range, all **PA6000** models have five inputs with independent front-panel controls and with professional XLR connectors with mechanical holding devices. The first two are of the electronically balanced microphone type, with a phantom power supply (input 1 with automatic VOX activation). The third can be used either as a microphone input or as an input for **PMB106-G** microphone stations (RJ45 connector) with the possibility of making zone calls. The last two can be configured separately, as microphone inputs (with or without phantom power supplies) or as line inputs.

There are two auxiliary inputs (CD and TAPE) for connecting to external sources of music, with normalised input levels and a double RXA socket for using standard stereo cables.

There is a special Telephone/Emergency audio input with automatic activation (VOX) that can be used for a priority call. If the system requires acoustic correction, it is possible to connect any equalizer whatsoever or a device for protection against acoustic feedback (Larsen effect) to the PRE OUT and PWR IN sockets after positioning the control switch provided for this purpose.

All the models of this range ensure a high degree of reliability thanks to electronic devices protecting them from overload currents and over-temperatures of the power devices. Each unit also has a cooling fan, with automatic control of the speed depending on the temperature.

FUNCTIONAL FEATURES

- 2 off balanced/unbalanced microphone inputs with Phantom power supply.
- Microphone input or microphone bases of the PMB range.
- 2 off MIC/PH/LINE inputs with associated selector switch.
- 2 off auxiliary inputs for sound sources (TAPE/CD).
- Telephone/emergency audio input for priority calls with adjustable threshold and sensitivity.
- Front-panel level controls for each microphone and auxiliary input.
- Front panel overall volume control and treble and bass controls.
- Multi-purpose sound source module with CD-MP3/USB/SD CARD player and AM/FM tuner.
- Constant voltage (50/70/100 V) or 8Ω impedance loudspeaker output lines
- 6 output lines (zones) with front-panel level control for the music signal for each single zone.
- Output/input for connection to audio processors.
- Uscita/ingresso per il collegamento a processori audio
- Connection to an external amplifier for simultaneous music and speech in different zones.
- LED-type Vu meter for clear and immediate monitoring of output power.
- Micro-switches for setting the operating modes.
- Inclusion/exclusion of speech filter on all microphone inputs.
- Contacts for activating input precedence and override.
- "Music On Hold" output with output level control (output of selected auxiliary signal).
- Alerting signal (chime) with level control.
- Selectable 230/115 Vac and 24 Vdc mains power supply.



TELEPHONE/EMERGENCY INPUT

There is a special audio input (TEL/EMERG) on the rear terminal block, balanced with a transformer and with automatic activation of precedence (VOX). Controls for adjusting the level and the activation threshold are provided on the rear panel. This input can be used for connecting the appropriate audio output of a telephone switchboard.



CONFIGURATION MICRO-SWITCHES

The main feature of the PA6000 range is the presence of micro-switches on the rear panel enabling the settings of all the operational parameters of the equipment to be checked and/or changed. Specifically, it is possible to manage priorities among the various different audio inputs, to enable a warning signal, to enable VOX (automatic activation) of the MIC1 input and to programme the zones for calls by means of a precedence contact and from the telephone/emergency input.

MICROPHONE STATIONS CONNECTION

With the compact systems of the PA6000 range, connecting a PMB106-G microphone station, so as to enable messages to be sent to one or more receiving zones is simple and quickly done. It is essential to use SFTP CAT.5E shielded cables (IN UNITS input), and it is possible to connect up to 16 stations in cascade fashion over a maximum distance of up to 1 km. If necessary, the bases can be powered by means of their rear-panel sockets. The output level is adjustable by means of the appropriate front-panel control (MIC/UNITS).

MULTI-FUNCTION MODULE

Each unit of the PA6000 range has a multi-function module with a tuner/ CD/MP3 player that also enables external devices such as SD/MMC cards to be played and an USB storage unit.

The module has a display for indicating the presence or lack of CD/SD/MMC/USB media, the chosen functions, information about the tracks and the type of tuning selected. All the keys needed for control of the module are accessible on the front panel: selection of the device to be used, controls for playing out the tracks in the normal module, programming functions for listening to the pieces of music, repeating them or playing them out in random order. The AM/FM tuner can be used for automatic or hand tuning and for storage of 10 programmes in both bands.



EXTERNAL CALL AMPLIFIER

With a single internal amplifier, the compact system functions in the single-channel mode: a zone call will interrupt the background music also in those areas not receiving the call. With the PA6000 it is possible to connect an external dedicated voice amplifier. In this way it will be possible to receive both announcements and background music in different zones at the same time.

“MUSIC ON HOLD” OUTPUT

The presence of the Music On Hold output (MOH OUTPUT) provides an interesting function. The signal from the selected sound is always available, without being subject to any type of precedence. On the output terminal block provided for this purpose, there are a balanced line signal with a transformer (COM-HOT terminals) for connection to other equipment or to a telephone exchange, and a power signal (MON-GND terminals) for driving directly an 8 Ohm/1 W monitoring loudspeaker. The output level can be controlled directly from the rear panel.

CALLS TO ZONES

The unique feature of this equipment is that the group of zones to be activated for each available source of calls can be configured: the PMB106-G microphone stations can be used, directly via the keypad, to send a call to one or more receiving zones; the announcements to be made with automatic activation of the MIC.1 input, those to be made with the emergency input (TEL./EMERG) and those to be made by closing the precedence contact may affect one or more receiving zones, depending on the settings made by means of the micro-switches on the rear panel.

MODEL	PA6120	PA6240
Rated power output	120 W	240 W
Constant voltage outputs / Low impedance outputs	100-70-50 V / 8 Ω	
Tones control	Bass ± 10 dB (100 Hz) ; Treble ± 10 dB (10 kHz)	
Microphone inputs (MIC.1 and MIC.2)	2 balanced XLR (Phantom supply 17,5 V), MIC1 with activation threshold (A.P.T.)	
Sensitivity/Impedance	1,2 mV / 1300 Ω	
S/N Ratio	> 66 dB	
Frequency response	40 ÷ 19.000 Hz	
Microphone input (MIC.3 / UNITS)	Balanced XLR (phantom supply 17,5 V) / 1 Rj45 (PMB106 microphone station unit)	
Sensitivity/Impedance	MIC: 1,2 mV / 1,3 kΩ ; UNITS: 850mV / 800 kΩ	
S/N Ratio	MIC: > 66 dB ; UNITS: > 76 dB	
Frequency response	MIC: 30 ÷ 20.000 Hz ; UNITS: 30 ÷ 20.000Hz	
Maximum number of microphone station units (PMB106-G)	Up to 16 stations in cascade fashion over a maximum distance of up to 1 km; if necessary, the bases can be powered by means of their rear-panel sockets	
Microphone/Line inputs (MIC / LINE 4 and 5)	2 balanced XLR with Phantom/Mic/Line selection	
Sensitivity/Impedance	MIC: 1,2 mV / 1,3 kΩ ; LINE: 110 mV / 130 kΩ	
S/N Ratio	MIC: > 66 dB ; LINE: > 77 dB	
Frequency response	MIC: 30 ÷ 20.000 Hz ; LINE: 30 ÷ 20.000 Hz	
Auxiliary inputs	2 RCA (CD + TAPE)	
Sensitivity/Impedance	CD: 450 mV / 35 kΩ ; TAPE: 220 mV / 18 kΩ	
S/N Ratio	> 80 dB	
Frequency response	30 ÷ 20.000 Hz	
Telephone/Emergency audio input (TEL / EMERG)	Balanced with terminals (HOT-COM-GND) with activation threshold adjustment	
Sensitivity/Impedance	105 mV / 6 kΩ	
S/N Ratio	> 74 dB	
Frequency response	200 ÷ 20.000 Hz	
Line signal outputs	5	
LINE OUT	Balanced XLR, 1 V / 3,9 kΩ	
PRE OUT	RCA, 0,8 V / 3,8 kΩ	
TAPE OUT	2 RCA, 0,9 V / 2 kΩ	
Music On Hold (MOH) PRE-AMPLIFIED LINE	Terminals (HOT-COM), 2 V / 300 Ω	
Music On Hold (MOH) AMPLIFIED LINE	Terminals (GND-MON), 1,9 W / 8 Ω	
Power supply	230/115 Vac - 50/60 Hz / 24 Vdc	
Maximum consumption	280 W (325 VA)	510 W (590 VA)
24 Vdc current consumption (max power / with no signal)	6,8 A / 0,2 A	13,1 A / 0,3 A
19" rack mounting (modular units)	Optional AC50/3 brackets (3U)	
Dimensions (W x H x D)	432 x 133 x 360 mm	
Weight	14 kg	16,5 kg



When it comes to CMDS systems, the **PA1000** range has excellent functional characteristics and stands out for its exceptionally good price/performance ratio. A multi-function module with a digital FM tuner, an MP3 player for a USB/SD-MMC card, an amplifier-mixer and the wide range of possible configurations make each of these units a versatile sound-broadcasting system able to cover the needs of any small or medium-sized installation.

The XLR sockets on the rear panel can be configured separately as microphone inputs (with or without phantom power supplies) or as line inputs: the mode is selected by means of the specific three-position switches. Each of these inputs has its own level control for metering the amplitude of the various different signals suitably. Furthermore, the INPUT1 microphone input has an automatic precedence function (VOX): when the microphone connected to this input is used to speak, all the music and microphone inputs will automatically be muted.

For connection to external music sources there is an auxiliary input with a double RCA socket for using standard stereo cables.

It's possible to connect all dynamic microphones and **B701-MG** microphone bases to PA1000 compact systems.

A precedence terminal block on the rear panel enables signals from the MP3 player, from the tuner and from the auxiliary input to be muted.

If, due to a particularly difficult environment, the system requires acoustic correction, it is possible to connect any equalizer whatsoever or a device for preventing acoustic feedback (Larsen effect) to the PRE OUT and PWR IN sockets. All the models ensure a high degree of reliability thanks to electronic devices protecting them from overload currents and over-temperatures of the power devices. Each unit also has a cooling fan, with automatic control of the speed depending on the temperature.

FUNCTIONAL FEATURES

- MP3 player module (via USB, SD or MMC card).
- Digital FM tuner.
- 3 MIC./LINE inputs with mode selection.
- 1 VOX input (INPUT 1).
- 1 auxiliary input for sources of sound (TAPE/CD).
- Front-panel level control for each microphone an auxiliary input.
- Front-panel master volume control and treble and bass control.
- XLR sockets for connecting dynamic microphones and/or **B701-MG** stations.
- Constant-voltage (25/70/100 V) or 4 Ω impedance loudspeaker line output terminal block
- Terminal block for activating precedence of microphone inputs.
- Output/input for connection to audio processors.
- Unbalanced line output for connection to other amplifiers.
- LED-type Vu meter for clear and immediate check of output power.
- Terminal block for DC power (24 Vdc).
- Selectable mains power (230/115 Vac).
- Mountable in standard 19" rack using optional brackets.

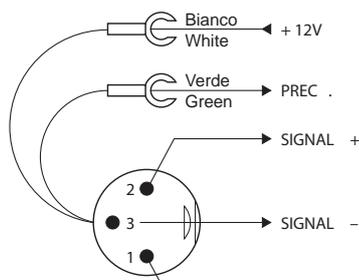


CONNECTIONS

Microphone precedence

When the precedence contacts (P and +) on the rear terminal block are closed, all the music sources and auxiliary input are muted.

Microphone stations B701-MG



Microphone inputs (XLR)

BALANCED connection

- 1 Shield
- 2 Signal (hot side)
- 3 Signal (cold side)



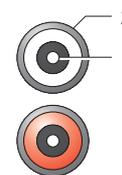
UNBALANCED connection

- 1 Shield and GND
- 2 Signal
- 3 Shield and GND

Auxiliary input (RCA)

UNBALANCED connection

- 1 Signal
- 2 Shield and GND



MODEL	PA1060		PA1120		PA1240	
RMS output power (THD <1%)	60 W		120 W		240 W	
Constant voltage outputs			100, 70, 25 V			
Low impedance outputs			4 Ω			
Tones control						
Bass tones @100 Hz			± 12 dB			
Treble tones @10 kHz			± 11 dB			
Microphone/line inputs	MIC.	LINE	MIC.	LINE	MIC.	LINE
Sensitivity/Impedance	3 mV / 1,5 kΩ	250 mV / 100 kΩ	3 mV / 1,5 kΩ	250 mV / 100 kΩ	3 mV / 1,5 kΩ	250 mV / 100 kΩ
S/N Ratio	68 dB	72 dB	70 dB	76 dB	70 dB	76 dB
S/N Ratio ('A' weighted)	73 dBA	80 dBA	73 dBA	82 dBA	73 dBA	82 dBA
INPUT 1 VOX activation threshold	0,9 mV	-	0,9 mV	-	0,9 mV	-
Frequency response			35 ÷ 16.000 Hz			
Phantom supply	18 V / 2,2 kΩ	-	18 V / 2,2 kΩ	-	18 V / 2,2 kΩ	-
Auxiliary input						
Sensitivity/Impedance			400 mV / 22 kΩ			
S/N Ratio	78 dB		80 dB		80 dB	
S/N Ratio ('A' weighted)	85 dBA		82 dBA		85 dBA	
Frequency response			30 ÷ 18.000 Hz			
VOX and precedence attenuation			- 60 dB			
PWR IN input						
Sensitivity/Impedance			1 V / 22 kΩ			
S/N Ratio	85 dB		93 dB		93 dB	
S/N Ratio ('A' weighted)	100 dBA		100 dBA		100 dBA	
Frequency response			30 ÷ 18.000 Hz			
LINE OUT output						
Output level / Impedance			1 V / 200 Ω			
PRE OUT output						
Output level			1 V			
Power supply						
			230/115 Vac - 50/60 Hz / 24 Vdc			
Maximum consumption @230Vac	P= 150 W		P = 300 W		P = 600 W	
Maximum consumption @24Vdc	4 A		10 A		20 A	
Dimensions (W x H x D)			430 x 88 x 270 mm			
Weight	6,3 kg		8,3 kg		10,5 kg	

P8083 | CD-MP3/USB/SD Card player and FM/AM stereo tuner.



A single container that can be mounted in a standard 19" rack and is one modular unit high, comprises a CD-MP3/USB/SD Card player and an FM/AM stereo tuner. Volume control and independent audio outputs on a double RCA socket for both sources of sound. There is an additional combined audio output from which it is possible to pick up both signals of the modules with priority of the CD player over the tuner. The CD player module has a back-lit display, a shockproof system, and normal, repeat, random or programmed play functions. The CD player is supplied with a remote control enabling full remote management. Stereo FM/AM tuner module with backlit display, automatic and/or manual tuning, pre-selection of up to 20 stations (10 FM plus 10 AM), and SLEEP function. FM and AM aerial included.

MODEL	P8083
Mains power supply	230 Vac / 115 Vac ±10% 50/60 Hz
Dc external power supply	24 Vdc
Consumption @230 Vac	45 VA
Consumption @24 Vdc	700 mA (max)
CD/USB/SD player output level	250 mV
Tuner output level	450 mV
Dimensions (W x H x D)	482 x 44 x 285 mm
Weight	4,5 kg

P8083-R | Digital USB/SD Card player/recorder



The **P8083-R** is a digital recorder and player for audio files in MP3 format on external storage devices such as SD cards or USBs (playing of MP3/WMA audio files and recording in MP3 format). Front-panel master volume control. Rear-panel line input and output on a double RCA socket. Management of external storage devices from 128 MB to 16 GB (SD Card/USB). Possibility of selecting the recording quality (128 Kbps or 192 Kbps). Recordable audio tracks up to a maximum of 99. It is possible to programme customised sequences for playing out the music and to select and repeat a single section of a piece of music. Files can be deleted and it is possible to copy data from a USB to an SD card or vice versa. Large backlit display for showing the various different functions. A remote control enabling full remote management is supplied with the equipment. The P8083-R has provisions for mounting in a standard 19" rack and has the height of a single unit.

MODEL	P8083-R
Mains power supply	230 Vac / 115 Vac ±10% 50/60 Hz
Dc external power supply	24 Vdc
Consumption @230 Vac	45 VA
Consumption @24 Vdc	300 mA (max)
Output level	0,9V
External memory management	128 MB ÷ 16 GB (SD / SDHC / USB)
Recording quality (selectable)	128 Kbps / 192 Kbps
Dimensions (W x H x D)	482 x 44 x 285 mm
Weight	4 kg

MODELS AVAILABLE ON REQUEST

Other models created by combining various different modules of the P8083 range are available on request. They all feature a standard container suitable for mounting in a standard 19" rack and of the height of one modular unit. Double RCA sockets are provided for connecting the line outputs on the rear panels, using standard stereo cables. Power supply requirements: 230/115 Vac - 50/60 Hz / 24 Vdc. Dimensions (W x H x D): 482 x 44 x 285 mm

P8083-ALL | CDM-P3/USB/SD CARD player and FM/AM tuner. Master volume control. Backlit display. CD player with shock-absorbing system. normal, repeat, random or programmed play functions. Tuner with automatic scanning and pre-selection of up to 20 stations (10 FM and 10 AM stations). Remote control and aerials included in the supply.

P8083-2ALL | Double CD-MP3/USB/SD CARD player and FM/AM tuner.

P8083-T | FM/AM stereo tuner. Master volume control, backlit display, automatic and manual tuning, pre-selection of up to 20 stations (10 FM and 10 AM stations) and SLEEP function. FM and AM aerial included in the supply.

P8083-2T | Two completely independent FM/AM stereo tuners.

P8083-P | CD-MP3/USB/SDCARD player with PITCH speed control. Master volume control and control of speed at which the audio tracks are played out (PITCH). Backlit display, shock-absorbing system and normal, repeat, random or programmed play functions. Remote control included in the supply.

DMX8008 • 8IN/8OUT MATRIX-MIXER



The **DMX8008** model is a high-performance 8 inputs x 8 outputs digital matrix-mixer; specifically designed for commercial and professional applications such as conference rooms, auditoriums, and public entertainment venues. The device includes 8 independently switchable MIC/LINE inputs with Phantom power supply, 8 balanced line outputs, 8 IN/OUT logic control ports, TCP/IP and RS485 In/Out connection; it offers complete addressing between inputs and outputs for multi-zone applications where the **DMP8008** remote panel provides the dual control function on the single zone or global; the complete configuration of two dynamic algorithms such as N.O.M. and GAIN SHARING guarantee full functionality of the DMX8008 as Automixer. For each input channel, it is possible to select the MIC/LINE sensitivity, select a first-order Lo/Hi-pass filter, configure a 3-band parametric EQ, configure the Noise Gate and set the anti-feedback based on the “Pitch Shifting” algorithm. For each output a 5-band parametric EQ is available, together with crossover filters up to the fourth-order, a compressor section with Peak Limiter, phase control and Delay; 8 IN/OUT logic ports complete the interface to other systems (eg: it is possible to recall room scenarios and synchronize them to a particular audio preset). Furthermore, each input has a priority level selection for the management of emergency messages and microphone signals.

MODEL	DMX8008
AUDIO	8, electronically balanced (Mic - Line - Unbalanced)
Analog inputs / Analog outputs	8, electronically balanced / Line: +14 dBu; Mic: -20/0 dBu (+6 dBu unbalanced)
Input level / Output level	35 dB (23 dB analog, 12 dB digital)
Microphone input gain	+14 dBu
THD + N	0.005% @ 1 kHz 0 dBu
S/N ratio / Frequency response	> 104 dBA / 20 Hz ÷ 20.000 Hz ± 1 dB
AD & DA converters	4 x AK5385B 24bit, 1 x AK4358 24bit (48 kHz)
Phantom power supply	48 Vdc
DSP & PROCESSING	
DSP processor	Dream SAM3716, 24bit (data) x 96bit (coeff.), resolution 24 x 32 bit
EQ input	3-band parametric (Peaking or Low/High Shelving)
EQ output	5-band parametric (Peaking or Low/High Shelving)
EQ gain / EQ frequency	-12 dBu ÷ +12dBu (0.5 dBu steps) / Resolution: 1/24 octave (20 Hz steps)
Q/BW EQ	Q from 0.4 up to 10 (0.1 steps)
HPF/LPF crossover	Butterworth 6/12/18/24 dB per octave; Bussel, Linkwitz-Riley and custom 12/24dB per octave; Resolution: 1/24 octave
RMS compressor and peak limiter	Threshold: 14.2 dBu ÷ -33.8 dBu ; Attack Time: 5 ms ÷ 200 ms (1ms up to 20ms, 10ms up to 100ms, 20ms up to 200ms) Release Time: 0.1s ÷ 3s (resolution 0.1s) ; Ratio: 1:1 ÷ 32:1 (compressor) ; adjustable Soft or Hard Knee (compressor)
Delay	380,998 ms (21 us steps)
Feedback / Automixer	Pitch shifting algorithm (microphone channels only) / NOM, GAIN SHARING, DUCKING algorithm
GENERALS	
Presets	6 standard presets + 4 extra (remote access)
Mains power supply	90 ÷ 240 Vac 50/60 Hz - 40 W
Dimensions (W x H x D) / Weight	483 x 44 x 229 mm (1U) / 3,5 kg



The **MX5124** model is a mixer pre-amplifier with 12 inputs and 4 outputs.

Four of these inputs are MIC/LINE type, with Neutrik Combo connector, XLR balanced micro input with 1mV sensitivity and stereo jack for the balanced line (0.775 V sensitivity). These inputs can have priority over all the others, and the first inputs has priority over the other three.

In addition to volume control, the micro inputs feature a “voice” control and the possibility to activate a 24 Vdc Phantom power supply. The mixer also features 4 stereo line inputs on double RCA connectors for music sources, activated by means of a dedicated selector, with volume and tones control.

Outputs are 2 XLR type for the right and left channels, with independent volume controls and a mono/stereo selection function. The outputs are completed by 2 stereo outputs, one of which dedicated to recording.

MODEL	MX5124
MONO CHANNEL MIC	
Impedance	2,2 kΩ
Max. input signal	0 dBu
Max. gain (@main out)	65 dB
CMMR (@ main out, 75 dB gain)	-65 dB
MONO CHANNEL LINE	
Impedance	33 kΩ
Max. input signal	30 dBu
Max. gain (@main out)	25 dB
MONO CHANNEL TONES	
Voice	± 12 dB
STEREO CHANNEL LINE	
Impedance	22 kΩ
Max. input signal	10 dBu
Max. gain (@main out)	10 dB
STEREO CHANNEL TONES	
Bass (@ 12 kHz)	± 15 dB
Treble (@ 12 kHz)	± 15 dB
GENERAL OUTPUTS	
Impedance	600 kΩ
Max. output (@ main out)	22 dBu
Distortion + Noise @ 16 dBu (@main out, 40 dB gain)	0,025%
S/N ratio (20 dB)	96 dB
Frequency response (@ 0/1 dB)	20 Hz ÷ 20.000 Hz
Dimensions (W x H x D)	482 x 44 x 160 mm
Weight	2,1 kg

DLC9000 | Automatic audio level controller



FUNCTIONAL FEATURES

- Level of background noise shown in real time.
- Storage of background noise level (minimum and maximum).
- Level of attenuation definable on the basis of the required S/N ratio.
- Incremental adjustment of the ratio.
- "Precedence" contact or "VOX" function for emergency calls.
- Monitoring loudspeaker.

The **DLC9000** is a device for automatic control of the audio level for broadcasting messages in places featuring variable background noise levels such as, by way of example, a railway station or a chain store where the level of the background noise is higher when the area is crowded than when there is no movement. The DLC9000 uses a microphone, not included in the supply (for example, an **M940** dynamic microphone or an **MC102** flat electret microphone) to detect the ambient noise. The output of the control is connected between the pre-amplifier and the power amplifier of the zone considered.

MODEL	DLC9000
Mains power supply	230 Vac ± 10% 50/60 Hz
External DC power supply	24 Vdc
Phantom power supply	12 V
Max. power absorbed (by mains)	10 W
Max. power absorbed (by 24Vdc input)	480 mA
Max. monitor loudspeaker power	1 W
Line attenuation	0÷78 dB
Impedance of SENS MIC input (balanced)	1 kΩ
Impedance of LINE IN input (balanced)	500 Ω
Impedance of LINE OUT output (electronic, balanced)	330 Ω/line
Maximum signal amplitude	2 Vrms
S/N ratio	62 dBA
Selectable averages	1, 2, 4, 8, 16, 32, 64
'Min' and 'Max' excursions settable	0÷ ±20 dB
Precedence control	12 V
Precedence activation threshold (Vox)	35 mV - 90 mV 200 mV - 280 mV 370 mV - 470 mV 720 mV - 1,15 V - 2 V
Fixed attenuation	0÷78 dB
Selectable incremental ratio	1 : 0,25 1 : 0,50 1 : 1 1 : 2
Microphone calibration	± 4 dB
Dimensions (W x H x D) / Weight	275 x 225 x 45 mm / 2,150 kg

The noise measuring device is extremely simple to configure. The various different stages of programming can be selected easily using only three push-buttons (Up/Down and Select) in the menu shown on the 16-digit backlit display. Rack mounting with optional **27/2469** brackets (1 U).

DAG9300 | Alarm-tone generator and voice recorder

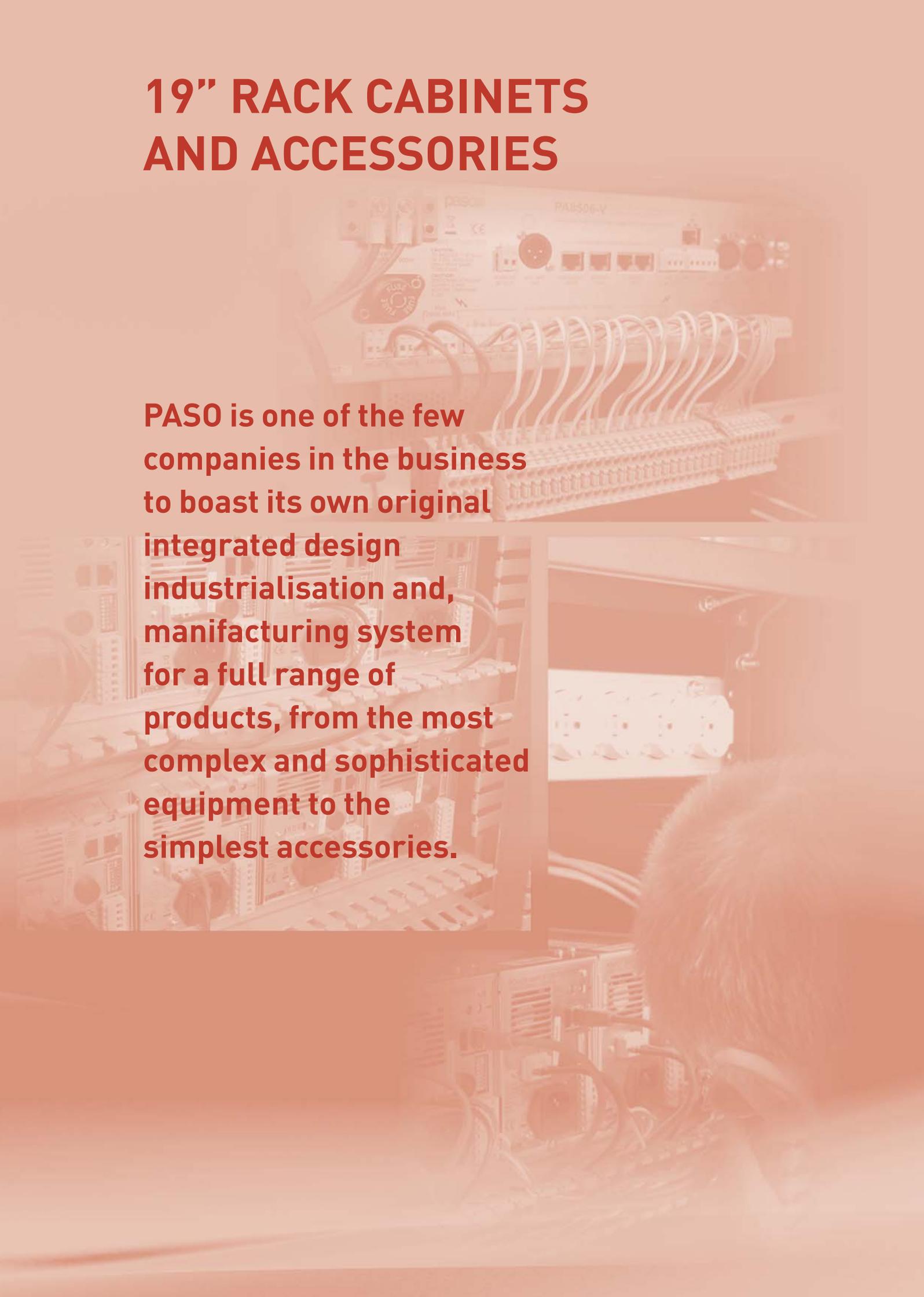


The **DAG9300** is an alarm-signal generator that can be used to record and play out two voice messages. 12 different alarms (to be chosen from among the 20 different synthesised tones available). The tones and pre-recorded messages can be activated either by means of the front-panel controls or by means of contacts on the rear panel. A very interesting feature is that a microphone station of the **B711** range can be used to record a voice message and play it out with a certain delay after completion of the recording ("DELAY PLAY" mode). In this way it will be possible to make voice announcements to be broadcast with a certain delay, so as to avoid triggering the Larsen effect, created when the microphone is too close to the loudspeakers. With the "REC PLAY" mode, on the other hand, it will be possible to use the base for sending out a pre-recorded message. Standard rack 19" mounting (1U).

MODEL	DAG9300
Mains power supply	230 Vac ±10% 50/60 Hz 5W
External DC power supply	24 Vdc 140 mA
Number of alarms / messages	12 / 2
Max. message recording time	NORM: 60 sec. HIGH: 40 sec.
Alarm play time	60 sec. / continuous
Continuous alarm frequency range	400 ÷ 900 Hz
Auxiliary input	
Sensitivity / Impedance	200 mV / 25 kΩ
S/N ratio	75 dB
Frequency response	40 ÷ 20.000 Hz
Recorded message	
S/N ratio	50 dB
Frequency response	NORM: 50 ÷ 3.500 Hz HIGH: 50 ÷ 5.500 Hz
Output level / Impedance	1 V / 50 Ω
Operating temperature	-10°C ÷ +45°C
Dimensions (W x H x D) / Weight	482 x 44 x 135 mm / 2,5 kg

19" RACK CABINETS AND ACCESSORIES

PASO is one of the few companies in the business to boast its own original integrated design industrialisation and manufacturing system for a full range of products, from the most complex and sophisticated equipment to the simplest accessories.





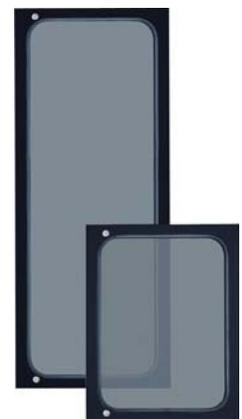
These rack containers have been specifically designed for housing all PASO electronic equipment and service panels with provisions for modular fixing in 19" racks and to comply with IEC 297-2 and CEI EN 60065 standards. Also, as called for in the general safety regulations for electrical systems (CEI 64-8, CEI 64-11, CEI 23-48), both the racks and the various different accessories (doors, closing panels, etc.) are equipped with the appropriate terminals for connection to earth.

All the models of both **P5800-D** range and the new **P5800-L** range (depth = 65 cm) are made of thick reinforced steel sheeting and are available in black.

A mounting kit consisting of two sides with ventilation slits, an upper closing panel and a lower one, four feet, a set of screws for mechanical assembly, 4 cables with lugs on the ends for connecting the equipment to earth and a set of caged nuts for securing the service equipment. Black front window panels with double locks are available for opening to the right or to the left (**P5700** range). As an alternative to the normal rear closing panels secured by screws, black blind rear doors with locks and ventilation slits are also available (**P5400-D** range).



Rack cabinets



Front window panels



Rear closing panels



Rear doors

Service panels



P8001-B
Panel with 16 A mains switch, ON/OFF lamp and mains fuse (1 U).



P8002-M
Monitoring panel with 6-position switch (6 lines), volume control and loudspeakers (1U).



P8003/2-B
Forced ventilation panel complet with two 230 Vac - 50/60 Hz fans (3 U).



P8004
Panel with mains 50 A circuit-breaker and ON/OFF lamp. Monitoring section with 6-position switches, loudspeaker and volume control (2 U).



P8009
Mains distribution unit with nine multi-standard sockets.



P8032
Drawer for accessories (3 U).



P8035
Top for supporting audio/video sources and various types of equipment (adaptable 2, 3 and 4 U).

Accessories



AC50
Pair of side brackets.



AC51
Pack of 40 caged nuts (type: M5).



AC52
Pack of 20 screws and 20 washers (type: M5).

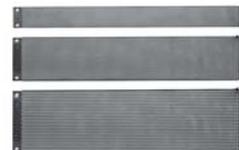


AC54-D
Kit consisting of four wheels, load-bearing capacity: 65 Kg each.



AC5801-D
Foundation base for cabinets with cable output.
* Only for P5800-D series racks.

Closing panels



Perforated panels
Equipped with earth terminals.
P5201-D 1 modular unit
P5202-D 2 modular unit
P5203-D 3 modular unit



Blind panels
Equipped with earth terminals.
P8011-D 1 modular unit
P8012-D 2 modular unit
P8013-D 3 modular unit
P8014-D 4 modular unit

MODEL	P5808	P5812-D	P5816-D	P5820-D	P5824-D	P5830-D	P5840-D	P5828-L	P5836-L	P5842-L
Modular units	8 U	12 U	16 U	20 U	24 U	30 U	40 U	28 U	36 U	42 U
Technical specifications	19" standard rack consisting of two sides with ventilation slits, an upper closing panel and a lower one, a set of screws for mechanical assembly, cables with lugs on the ends for connecting the equipment to earth and a set of caged nuts for securing the service equipment.									
Width	52,5 cm									
Depth	45,6 cm	52,5 cm						65 cm	65 cm	65 cm
Height	40,8 cm	58,6 cm	76,4 cm	94,2 cm	112 cm	138,6 cm	183,1 cm	129,8 cm	165,3 cm	192 cm
Front window door	-	P5712	P5716	P5720	P5724	P5730	P5740	P5728-L	P5736-L	P5742-L
Rear door	-	-	P5416-D	P5420-D	P5424-D	P5430-D	P5440-D	P5428-D	P5436-D	P5442-D
Rear closing panel	P5404-D (4 U), P5408-D (8 U) and P5410-D (10 U)									
Colour	Black									



ACFK20, ACFK20-DIN | VOX audio filter board

The module **ACFK20** activates an Automatic VOX function in presence of a signal in input despite the presence of tone signals (typically 30 Hz and 20 kHz) used for diagnosis in voice evacuation systems. The input signal, filtered eventually, is brought - via a line buffer - to low impedance and balanced output. The board audio input can be connected to signal line (0 dB) or to the usual 100V speakers (100V). Suitable trimmers allow VOX and audio output levels set up. During the installation, it is possible to select

the filter (Low -pass and or High-pass). An output relay contact will be activated during a VOX active function status. The interface then helps to report to the eventual auxiliary apparatus the presence of an audio signal (for example an announcement message) excluding eventual pilot tone of control. The boards require an external power supply within the range of 12Vdc - 24Vdc. ACFK20 can be installed inside an electrical derivation box, while **ACFK20-DIN** is supplied with a plastic box for an easy and fast installation on standard DIN guide.

MODEL	ACFK20	ACFK20-DIN
Power supply	11 ÷ 28Vdc	11 ÷ 28 dc
Absorption @24Vdc	40 mA	40 mA
Absorption @12 Vdc	80 mA	80 mA
Maximum input signal	2 Vrms / 100 Vrms	2 Vrms / 100 Vrms
Output level / Output impedance	Max 4 Vrms / 200 Ω	Max 4 Vrms / 200 Ω
Gain (max)	6 dB	6 dB
VOX activation threshold (min/max)	20 mV / 2V	20 mV / 2V
Maximum relay contact capacity	Imax 300 mA 60Vcc	Imax 300 mA 60Vcc
Low-pass filter cut-off frequency (-3dB)	200 Hz	200 Hz
High-pass filter cut-off frequency (-3dB)	10 kHz	10 kHz
Dimensions	50 x 103 x 15 mm	53 x 87 x 58 mm

ACREL2, ACREL2-DIN | 2-AUX-relay board

The board **ACREL2** is ideal for cabling and installatons where the relay use is necessary for generic purposes. The board is equipped by two independent relays with double ex-change 5A (500W/100V) with all In/Out present contacts on terminal strip. The particularity of this interface is the versatile power supply circuit which allows the coil to be driven within the range of 12Vdc - 24Vdc.

The board ACREL2 can be inserted inside an electrical derivation box, while the module **ACREL2 -DIN** is supplied with a plastic box for a practical and fast installation on standard DIN guide.



ACLTR1, ACLTR1-DIN | 100V/Line interface board

The module **ACLTR1** allows audio signal interface through a galvanic separator transformer. The audio input of the board can be connected to a balanced mono line 0db, 4 Ohm amplified line, 100V constant tension line or to an unbalanced signal line L+R (audio sources typical signal) in order to have the sum of L+R channels in mono. The output line level is balanced by a transformer and its setting can be done thanks to an appropriate trimmer used

in attenuation or by inserting a passive filter in order to eliminate the test signal (typically 20 KHz) used with voice evacuation system. These boards are passive units and do not require external power supply. This module is necessary for long distance connections of unbalanced sources or when it is necessary to convert the signal coming from a 100V speaker line to a 0 dB signal line. The module **ACLTR1** can be installed inside an electrical derivation box.

The **ACLTR1 -DIN** is already supplied with a plastic box allowing a fast and practical installation into DIN standard guide.



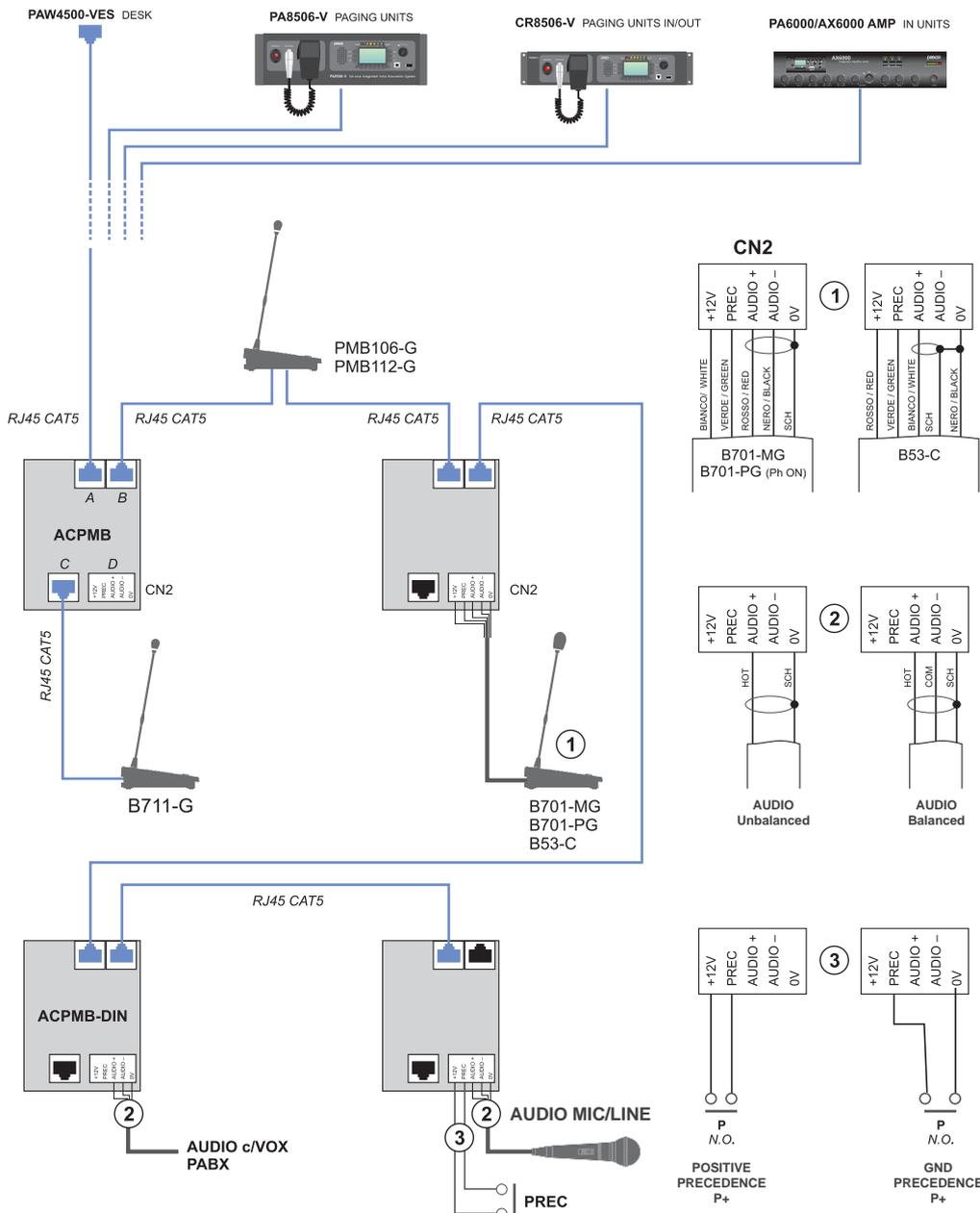
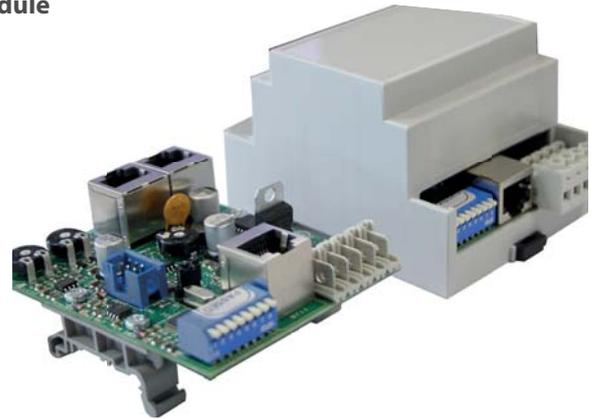
ACPMB, ACPMB-DIN | Microphone call stations interface module

The interface **ACPMB** allows to manage standard microphones (dynamic or electret types) or an audio input with level signals (0 dB) in order to operate within the communication line of **PMB106/112** PASO paging units series. These units are daisy chain connected to the same PMB stations system line.

On CAT5e SF/UTP cables are present power supply, analogue audio signal, digital command and interface addresses; it is possible to connect up to 4 units to the single serial line.

The audio input, electronically balanced with or without phantom power, can be a microphone input (**B700** series) or suitable to pre-amplified microphones stations (**B711**, **B53**, etc. series).

The volume output and input sensibility can be easily set through a trimmer. The interface operates in "automatic activation mode" through **VOX** with adjustable level or through a priority contact. Thanks to appropriate dip-switches, it is possible to set the selection of the zone to which the messages must be sent (general call or group of zones from 1 to 6). The **ACPMB** board can be fit in a common DIN rail electrical box. The item **ACPMB-DIN** is already supplied with a plastic box which is making practical and fast its relevant installation on standard DIN guide.





ACRJ45/M-DIN | RJ45/terminal strip connector adapter

The **ACRJ45/M-DIN** is an ideal adapter for installation and cabling purposes when the soldering or the crimping are not recommended. **ACRJ45/M-DIN** features a female RJ45 socket where the pins are 8 quick coupling, the wires can be fast-fixed thanks to flathead screwdriver. **ACRJ45/M-DIN** is having a specific support for installation on DIN standard guide set internally to a rack or inside an electrical derivation box

MODEL	ACRJ45/M-DIN
Type of connectors	RJ45 female 180°
Terminal strip	Double
Type of terminals	Spring
Connection cable diameter	1,5 mm ²
Maximum current	1,5 A
IP degree	IP 00
Operating temperature	0°C ÷ 55°C
Mounting	DIN guide
Standards	CE
Dimensions	30 x 65 x 82 mm

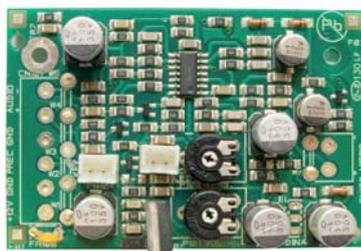
ACRJ45, ACRJ45-DIN | RJ45 In/Out terminal strip interface

The module **ACRJ45** is ideal for installations that need to wiring standard cables to cat5 cables via RJ45 connectors. **ACRJ45** allows - in a fast and easy way - daisy connections, derivations terminal, bus interruption and, when it becomes necessary, to insert an audio signal or a supplementary power supply in CAT5 lines. **ACRJ45** terminal strip interface features two RJ45 sockets for daisy connection continuity and screw clamps for single wires cabling.

The modules **ACRJ45**, besides normal RJ45 terminal adapter functions of **ACRJ45/M**, provide jumpers based on the different use set up and possible systems configuration as follows:

- Daisy bus interruption by opening the various RJ45 pins.
- To insert an analogue audio signal into the secondary input of PASO PMD amplifiers series on CAT5 line.
- To insert a supplementary power supply destined to pre-amplified stations (i.e. B711 and B53 series) by setting a protection by a diode on power supply pin.
- Parallel connection of two inputs "UNIT" (amplifiers AW5600 / AX3500 series) for the bases B711 and B53 series, with power supply protection.

The boards **ACRJ45** can be installed inside an electrical derivation box. The **ACRJ45-DIN** is already supplied with a plastic box allowing a practical and fast installation on DIN standard guide.



AC14-B | Pre-amplifier module

Pre-amplifier module for dynamic and electret microphones. Screw connectors. Suitable to install into standard electric box (e.g. 503). Balanced audio output. Sensitivity and output signal level can be adjusted. It has provisions for connection to a LED and a push-button activation.

Power supply 12/24 Vdc. | Dimensions: 74 x 50 x 10 mm

MICROPHONES, MICROPHONE UNITS AND WIRELESS SYSTEMS

PASO offers a full range of professional microphones, microphone units and wireless systems that combine exclusive design and specific technical characteristics able to meet any need.



M985

Very sensitive dynamic microphone with a hyper-cardioid pattern, suitable for use for both speech and music. Its high degree of directivity make it advisable also in difficult situations with acoustic feedback problems (Larsen effect). It has an ON/OFF switch and a 5-metre long XLR/XLR cable and a coupling for mounting on a stand.



M940

Unidirectional dynamic microphone with a cardioid pattern, for general use. It features high sensitivity, particularly good intelligibility of speech and good reproduction of music. The supply includes an ON/OFF switch, a 5-metre XLR/XLR cable and coupling for mounting on a stand.



M1-NC

Unidirectional dynamic microphone with PTT push button, 1.5 m spiralled cable and XLR plug.

MC102 • MC102-N

Ultra-flat surface microphones with a hemi-cardioid polar pattern. They are used on flat horizontal surfaces (tables, floors). Their peculiar directivity characteristics (60° from the front in respect of the surface on which they rest) makes them particularly suitable for conferences, religious ceremonies and/or theatrical events. Phantom power supply and 5-metre long cable with carrier case.



MC250

Pen microphone with a hyper-cardioid polar pattern. It ensures high levels of useful signal with a limited receiving angle, thus keeping the impact of surrounding noises to a minimum. It has a very extensive frequency response. It is suitable also for critical receiving situations at some distance from the source with minimum sensitivity to the Larsen effect.



MC260 • MC265

Family of electret microphones featuring an elegant appearance and able to meet the increasingly demanding specifications of architectural design and interior decoration of halls, conference rooms and places of worship. The cardioid type response of the microphone housing and the very sensitive electret capsule make these microphones perfect for enhancing the user's oratory qualities.

B260

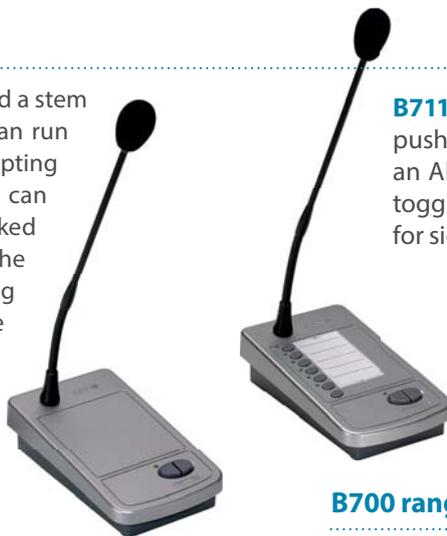
Table-top base for MC260 and MC265 microphones. Equipped with ON/OFF switch, XLR/F connector with mechanical locking device for fitting a microphone and rear XLR/M output connector.



MODEL	M1-NC	M940	M985	MC102 MC102-N	MC250	MC265	MC260
Characteristics	Dynamic unidirectional, cardioid		Dynamic unidirectional, hyper-cardioid	Electret unidirectional, hemi-cardioid	Electret, hyper-cardioid	Electret, cardioid	
Power supply	-			Phantom 11 ÷ 52 Vcc		Phantom 9 ÷ 52 Vcc	
Impedance	600 Ω	500 Ω	600 Ω	100 Ω	150 Ω	200 Ω	
Sensitivity	- 78 dB/ μbar	- 75 dB/ μbar	- 72 dB/ μbar	- 65 dB/μbar	- 54 dB/μbar	- 58 dB/μbar	
Frequency response	100÷10.000 Hz	80÷13.000 Hz	50÷16.000 Hz	50÷16.000 Hz	20÷20.000 Hz	50÷18.000 Hz	
Body	ABS	Zamak	Zamak	Die-cast Al	Brass	Brass	
Finish	Black	Black	Black	White (MC102) Black (MC102-N)	Mat black	Black	
Supplied accessories	1,5 m spiralled cable (XLR)	5m detachable cable (XLR)	5m detachable cable (XLR)	5m detachable cable (Micro-XLR/ XLR) and shock-proof carrying case	4,5 m detachable cable (XLR) Jointed microphone support, shock-proof carrying case	-	
Dimensions	100 x 60 x 50 mm	Ø 54 x 171 mm	Ø 53,5 x 176 mm	90 x 17 x 115 mm	Ø 23 x 163 mm	Ø 19 x 424 mm (Ø 7 stem)	Ø 19 x 550 mm (Ø 7 stem)
Weight	165 g	185,5 g	296 g	264 g	148 g	124 g	140 g

B700 range | Pre-amplified units

Each unit has an electret microphone and a stem with a flexible part on the unit. They can run on a 12 and/or 24 Vdc power supply, adapting to any application-related need. They can be mixed with one another or interlocked with two priority levels. The level of the microphone signal and of the warning tone ("Chime" generator included) can be adjusted via the rear panel.



B711/6-G | Pre-amplified unit with six zone push-buttons and associated signalling LEDs, an All-Call key, a hold-down call key (PTT), a toggle key (LOCK) for long messages and a LED for signalling activation of the microphone.

B711-G | Pre-amplified unit with a hold-down key (PTT, press to speak), a toggle button (LOCK) for long messages and a LED for signalling activation of the microphone.

B700 range | Non pre-amplified unit

B701-MG | Non pre-amplified unit with a dynamic microphone, a gooseneck stem and a status LED. It has a hold-down key (PTT, press to speak) and a toggle push-button (LOCK) for long messages.



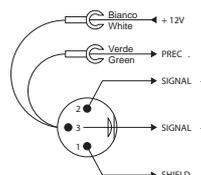
Pre-amplified microphone units connection

PIN	AUDIO IN/OUT	ZONE 1÷6
1	Audio +	Zone 1
2	Audio -	Zone 2
3	GND	Zone 3
4	Prec. IN/OUT	Zone 4
5	N. C.	Zone 5
6	+ Vdc	+ Vdc
7	Serial +	Zone 6
8	Serial -	GND
Shield	GND	GND

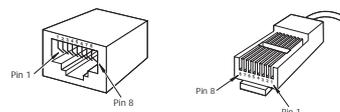
Each unit is equipped with RJ45 sockets for direct connection by means of SFTP Cat 5 shielded cables (AUDIO IN and AUDIO OUT). The B711/6-G unit also has a ZONES 1 to 6 socket for controlling the switching relays for the zones and/or for activating alarms.

The connectors must be of the shielded RJ45 type.

Non pre-amplified units connection



Each base is supplied with a 5-metre long balanced shielded cable fitted with an XLR plug and terminals for activating microphone precedence in PASO amplifiers.



PMB range | Digital microphone units

These models feature an electret microphone and a stem with a flexible part near the base. It can be run on a central and/or local power supply (18 to 36 VDC). The following can be configured from the keypad: setting of the address (up to 31), priority level (up to 7), adjustment of microphone sensitivity, programming of zone keys and of the All-Call key (ALL), activation of the speech filter for improved intelligibility.



PMB112-G | Pre-amplified unit with 12 programmable zone push-buttons and associated indicator LEDs, an All-Call key, a hold-down call key (PTT), a toggle button (LOCK) for long messages and a microphone activated and busy LED.



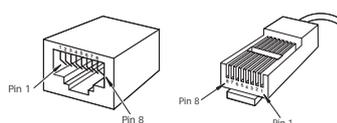
PMB106-G | Pre-amplified unit with 6 programmable zone push-buttons and associated indicator LEDs, an All-Call key, a hold-down call key (PTT), a toggle button (LOCK) for long messages and a microphone activated and busy LED.

PMB112-EG | Expansion keypad for PMB112-G microphone units, 12 programmable zone push-buttons, signalling LEDs, All-Call key. It is possible to connect up to two units in cascade fashion.



PIN	AUDIO IN/OUT
1	Audio +
2	Audio -
3	GND
4	Not connected
5	Not connected
6	+ Vdc
7	Serial +
8	Serial -
Shield	GND

PMB microphone units are equipped with RJ45 sockets for direct connection by means of SFTP Cat 5 shielded cables. **All the connectors must be shielded RJ45 type.**

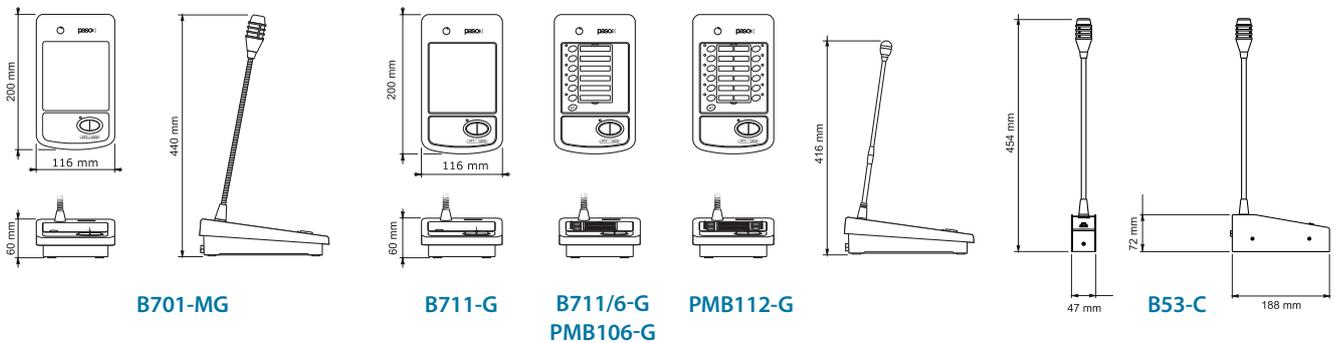


B53-C | Special applications

Pre-amplified microphone unit with a dynamic microphone featuring a gooseneck stem, a hold-down key for making calls and LED that lights up when a call is in progress. Its limited width makes it suitable for fixing to surfaces on which there is not much room (e.g. supermarket cash desks). Adjustable sensitivity and line output signal level. 1.5-metre long cable with weldable wires included in the supply.



MODEL	B701-MG	B711-G	B711/6-G	PMB106-G	PMB112-G	B53-C
Characteristics	Dynamic microphone, general call push-button (PTT), automatic release or one switch type (LOCK)	Electret microphone, general call push-button (PTT), automatic release or one switch type (LOCK), dynamics compressor			Dynamic microphone, general call push-button (PTT), dynamics compressor	
Zone selection	1	6 + ALL		12 + ALL		1
Sensitivity / Impedance	1,8 mV/Pa / 500 Ω	Trimmer adjustment		Keyboard adjustment		Trimmer adjustment
Frequency response	100 ÷ 12.000 Hz	100 ÷ 15.000 Hz		100 ÷ 14.000 Hz		50 ÷ 14.000 Hz
Output audio level	-	1,2 Vrms (balanced)		2,2 V max		2V RMS (unbalanced)
Connections	5 m cable with XLR plug and 2 terminals for activating microphone precedence	RJ45 (AUDIO OUT)	RJ45 (AUDIO OUT and ZONE 1÷6)		RJ45 (IN/OUT)	
Power supply	12 Vdc (precedence)	12 / 24 Vdc		18 / 36 Vdc		11 ÷ 28 Vdc
Consumption	LED 8 mA (12 V)	45 mA	60 mA	16 mA	22 mA	30 mA
Finish	Light grey ABS structure					Black metal
Dimensions (W x H x D)	116 x 440 x 200 mm	116 x 416 x 200 mm				47 x 454 x 188 mm
Weight	0,88 kg	0,8 kg		0,6 kg		0,8 kg
Accessories	AC700 fixing mounting kit for B700 and PMB microphone station range; ACPMB and ACPMB-DIN interface					-



COMPATIBILITY BETWEEN PASO MICROPHONE/CONSOLES AND AMPLIFIERS

MODEL	M1-NC M940 M985	MC102, MC250 MC260, MC265	B701-MG	B53-C	B711-G	B711/6-G	PMB106-G PMB112-G
Type	Dynamic microphone	Electret microphone (Phantom supply)	Unit with dynamic microphone (+12V precedence)	Pre-amplified unit with dynamic microphone (+12V precedence)	Pre-amplified unit (+12V precedence)		Pre-amplified unit (RS485 serial data)
Connector	XLR	XLR + 2 precedence wires	Wires	RJ45 sockets (SFTP CAT5 direct shielded cables and shielded connectors)			
Functionality	Mixing	Mixing or with priority if connecting precedence	With priority	With priority	With priority and zone selection keys		
Compatibility with audio inputs of PASO amplifier/control units							
AX3504	MIC 2	MIC 2 + Precedence	TEL/EMERG + Precedence (wires connection)	-	-		
AX3506, AX3512	MIC 1 ÷ 4	MIC 1 ÷ 4 + Precedence	TEL/EMERG + Precedence (wires connection)	IN UNITS	-		
AX6000 range	MIC 1 ÷ 5	MIC 1 ÷ 5 + Precedence	TEL/EMERG + Precedence (wires connection)	-	IN UNITS		
PA6000 range	MIC 1 ÷ 5	MIC 1 ÷ 5 + Precedence	TEL/EMERG + Precedence (wires connection)	-	IN UNITS		
PA1000 range	MIC 1 ÷ 3	MIC 1 ÷ 3 + Precedence	MIC 1 ÷ 3 + Precedence (wires connection and XLR)	-	-		
AW5600 range	-	-	TEL/EMERG + Precedence (wires connection)	IN UNITS	-		
P8036	-	-	-	BASE IN with precedence (wires connection)	BASE IN with prec. + ZONE (wires connection)	-	
P8136	-	-	-	Using ACIO8136 module (wires connection)			MASTER UNITS and LOCAL UNITS
P8236	-	-	-	Using ACIO8136 module (wires connection)			LOCAL UNITS
Connection accessories							
Extension cables	CV15, CV24	CV15, CV24 + 2 wires for precedence	-	CV20xx range cables			
Cable rolls	31/2-100	31/84-100	31/65-250	31/142-100			



The **MA855/R850A** kit is a wireless microphone system of the Diversity UHF type featuring high performance levels and PLL technology. It enables selection of 120 channels for maximum flexibility. The “Diversity” technology of the receiver and the microphone antenna ensure an exceptionally broad range for maximum reliability of the signal and freedom of movement.

The **MA855A** handgrip transmitter has a handy mute function, an LCD display, a keypad lock and a battery-status indicator.

The **R850A** receiver, which has its own power supply, is equipped with an automatic scanning system for identifying the frequency of the microphone, a large LCD display, an RF/AF level measuring device and a squelch circuit that enables any interferences present in the surrounding environment to be eliminated.

MODEL	MA855/R850A
Characteristics	<ul style="list-style-type: none"> • Hand-held wireless microphone with dynamic capsule • 120 channels
Carrier frequency	638 ÷ 662 MHz (UHF)
RF sensitivity	-100 dBm/30dB
Frequency response	50 ÷ 15.000 Hz
Receiver output level	Balanced XLR, 25 mV / Unbalanced Jack 6,3 mm, 750 mV
Operating range (line of sight)	100 m
Power supply	R850A receiver: 12 Vdc / 500 mA MA855A or MA853A transmitter: AA (2 off) batteries 1,5 Vdc or rechargeable NiMH batteries
Supplied accessories	AC/DC power supply units, audio LF cable, 2 antennas, color ID caps
19" rack mounting (modular units)	AC850 optional support for one R850A receiver (1 U) AC852 optional support for two R850A receivers (1 U)
Transmitters battery recharge	With AC855 optional charger
Dimensions (W x H x D)	MA855A transmitter: 51 x 278 mm R850A receiver: 210 x 46 x 159 mm
Weight	MA855A transmitter: 240 g R850A receiver: 950 g

ACCESSORIES FOR MICROPHONES AND MICROPHONE UNITS



27/59 | Adaptor for screwing supports **S1** and **S10** onto the pins of telescopic bases with M12 x 1 or 3/8" threads.



S1 | Jointed microphone support, can be screwed onto telescopic table-top or floor bases.



S8 | Jointed support for microphones and wireless microphones with spring-type seal.



S10 | Jointed microphone support, same features as the **S1**, with vibration damping elastic body.



B13-N | Floor stand

Complete with telescopic rod and folding tripod. With adjustable height and microphone boom. Height minimum / maximum: 92 ÷ 152 cm Base width: 70 cm | Weight: 2 kg

B116-B | Table top base in black cast-iron, with chromium-plated telescopic rod, adjustable from 37 to 60 cm. For microphone supports S1, S8 and S10.

B20-B | Floor stand with circular cast metal supporting structure. Telescopic rod with adjustable height and painted black tubular metal. Height minimum / maximum: 95 ÷ 175 cm Base width: 30 cm | Weight: 4 kg

B160 | Table top for MC30-GN microphones, complete with shielded cable (L) 100 cm. Dim.: Ø 4,5 cm; (H) 4,2 cm.

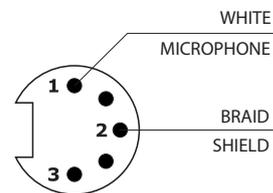
MC30-GN | Electret microphone

Electret microphone with a cardioid polar response and flexible support. It's equipped with a 5-poles DIN male connector. It is possible to use with **AC14-B** preamplifier card (see page 43).

Length: 44 cm

Frequency response: 100 ÷ 20000 Hz

Sensitivity: - 67 dBV/µbar | Impedance: 680 Ω



CODE	DESCRIPTION
CV2002	CAT5e SF/UTP shielded cable, length 2 m, with RJ45 connectors
CV2005	CAT5e SF/UTP shielded cable, length 5 m, with RJ45 connectors
CV2010	CAT5e SF/UTP shielded cable, length 10 m, with RJ45 connectors
31/142-100	CAT5e SF/UTP shielded cable, 100 m roll
31/2-100	Shielded cable (2 wires + shield), 100 m roll, suitable for microphones connection
31/84-100	Shielded cable (2 wires and 2 wires + shield), 100 m roll, suitable for non pre-amplified microphone units (as B701-MG)
31/65-250	CEI 20-22 II cable, (3 wires + 1 shielded wire), 250 m roll, suitable for pre-amplified microphone units (as B53-C)
CV15	5 m microphone extension cable, complete with male and female XLR connectors
CV24	10 m microphone extension cable, complete with male and female XLR connectors

SPEAKER UNITS

Thanks to the variety of models and characteristics of PASO speaker units, it is easy to find just the right model and the most suitable for each and every application and/or environment.





C7200-EN 
100 W, H=849 mm

The **C7200-EN** sound column is extremely compact and elegant, and features a refined and functional design. Its uncompromising quality enables it to meet the requirements of the most demanding installations.

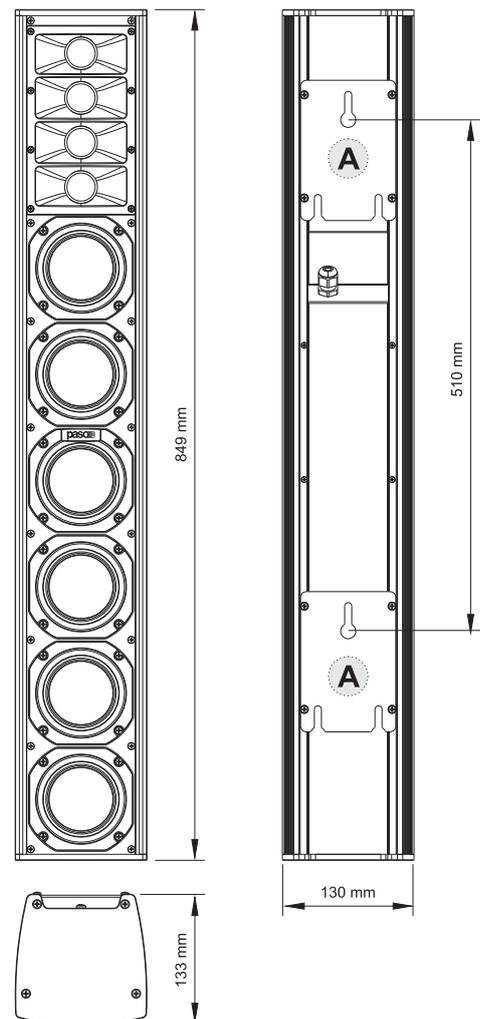
This unit is equipped with six 4" woofers and four 1" tweeters. The cylindrical wave-front of this sound column makes for the pleasant effect of a very powerful and precise forward-projected sound, with none of the typical reverberation of conventional speaker units that excite reflections within the environment, directing acoustic energy where it is not needed. The very narrow and elongated shape enables this sound column to fit into any environment in a very discreet manner that is not invasive at all. It comes complete with a thermal cutoff and a flame-proof connecting cable (L: 90 cm).



This speaker unit is certified for use in voice evacuation systems.

C7200-EN Cert. EN54-24 no. 0068/CPR/058-2013

MODEL	C7200-EN
Rated power	100 W
Adjustable power	100 / 50 W
Rated impedance	8 Ω
Loudspeakers	6 Wf + 4 Tw
Characteristics	Struttura in alluminio
Sound pressure SPL Pnom/1m	110 dB
Efficiency 1W/1m	91 dB
Frequency response	140 ÷ 20.000 Hz
Dispersion angle @ 2 kHz	Or. 120° - Ver. 15°
Protection degree	IP 32
Mounting	AC7200 Wall-mounting jointed support
Colour	White
Dimensions (W x H x D)	130 x 849 x 133 mm
Weight	8 kg



NOTE

This speaker unit can be wall mounted using the **AC7200** jointed support (not included).



Suited to both indoor and outdoor use, the **C6000-EN** range is completely dustproof and waterproof and offers powerful features for systems integrators facing challenging acoustic conditions.

Equipped with four 3" full range woofers, these columns have the same sleek, lightweight and durable, powder-coated aluminum housing. Completely dustproof and waterproof, the enclosure's grille is covered with a special hydrophobic fabric to ensure absolute rejection of all atmospheric agents (IP protection degree). The C6000-EN range also offers powerful features for systems integrators facing challenging acoustic conditions. Both the C6120-EN and C6060-EN are characterized by an integrated passive directivity control system which delivers a consistent frequency-based vertical dispersion, and which offers users the choice of two angles – NARROW and WIDE. Full EN54-24 certification also means each column can be used for emergency and evacuation applications – in the event of a fire, all **C6000-EN** columns are equipped with a ceramic terminal block and thermal fuse.

A wide range of accessories is also available for total system configuration flexibility. The accessories match to the enclosures with sliding guides and integrated quick release pins for an exceptionally quick, easy and effective installation.



Flying bar
AC6101 (white)
AC6101-N (black)



Joint bar
AC6102 (white)
AC6102-N (black)

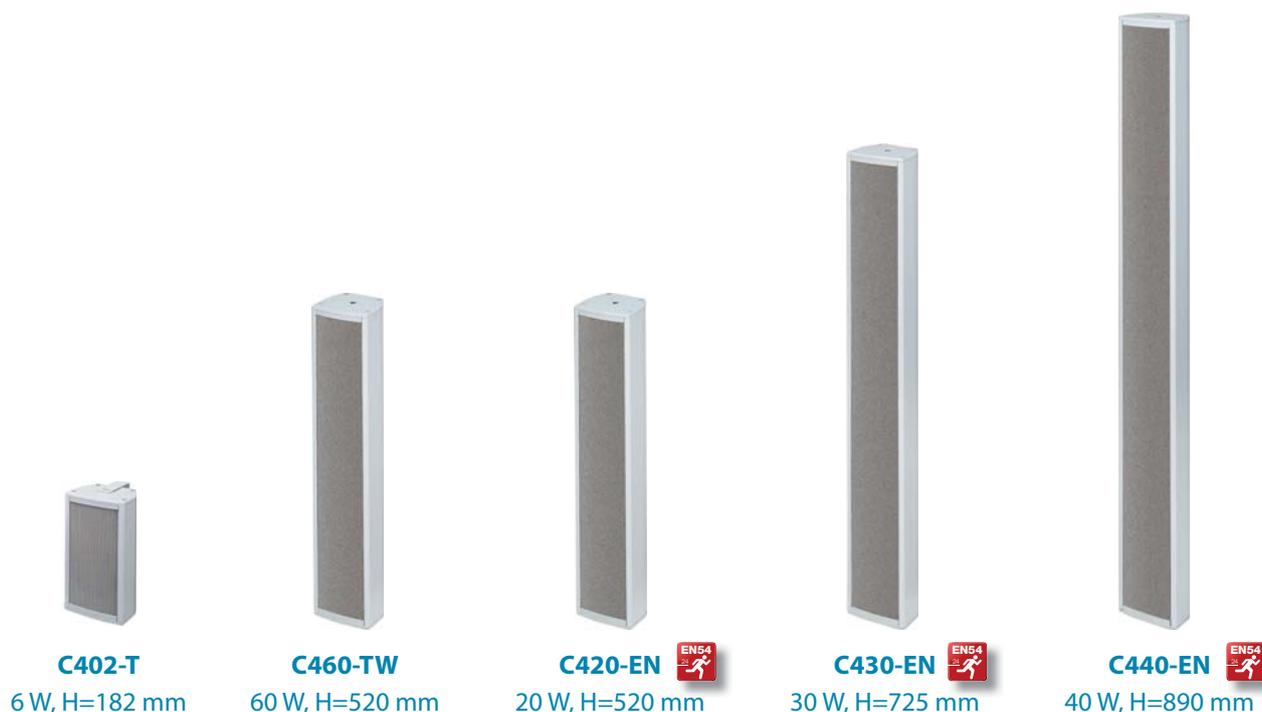


Vertical support
AC6103 (white)
AC6103-N (black)



Horizontal support
AC6104 (white)
AC6104-N (black)

MODEL	C6060-EN	C6060N-EN	C6120-EN	C6120N-EN
Rated power	60 W	60 W	120 W	120 W
Adjustable power	60 W / 30 W	60 W / 30 W	120 W / 60 W	120 W / 60 W
Loudspeakers	4 Wf 3"	4 Wf 3"	8 Wf 3"	8 Wf 3"
Characteristics	Aluminium structure	Aluminium structure	Aluminium structure	Aluminium structure
Sound pressure level SPL cont/peak	113 dB / 116 dB	113 dB / 116 dB	119 dB / 122 dB	119 dB / 122 dB
Efficiency 1W/1m	92 dB	92 dB	95 dB	95 dB
Frequency response	140 ÷ 20.000 Hz			
Dispersion angle	H: 110° x V: 25° <i>narrow</i> H: 110° x V: 50° <i>wide</i>	H: 110° x V: 25° <i>narrow</i> H: 110° x V: 50° <i>wide</i>	H: 110° x V: 15° <i>narrow</i> H: 110° x V: 40° <i>wide</i>	H: 110° x V: 15° <i>narrow</i> H: 110° x V: 40° <i>wide</i>
Protection degree	IP 55	IP 55	IP 55	IP 55
Mounting	Supports AC6101 (-N), AC6102 (-N), AC6103 (-N), AC6104 (-N)			
Colour	White	Black	White	Black
Dimensions (W x H x D)	100 x 368 x 125 mm	100 x 368 x 125 mm	100 x 704 x 125 mm	100 x 704 x 125 mm
Weight	2,8 kg		4,7 kg	



A compact size and high acoustic performance are the typical features of the sound columns of the **C400-EN** range. They consist of a weight-bearing structure made of extruded aluminium painted pale grey, a solid front grille and sealed shockproof end panels.



S4-B

Each column has a swivelling support for quick securing to a wall and a constant-voltage line transformer. Connections to the various sockets are made via the cable coming out of the column. A pair of sliding guides running along the whole height of the rear of the column enables the **S4-B** swivelling support included in the supply to be positioned so as to simplify mounting. The acoustic properties of this sound column are characterised by great intelligibility of speech and excellent reproduction of music, in addition to the limited size. This means that they are the ideal choice for places that are difficult from the acoustic point of view, where uniform distribution of the sound and excellent directivity are required.

Models **C420-EN**, **C430-EN** and **C440-EN** are equipped with a constant-voltage line transformer, a ceramic terminal block, a thermal cutoff fuse and fire-resistant cable according to **UNI 9795 2010** (length: 80 cm).

Model **C460-TW** is also suitable for outdoor use in poor weather conditions. The two-way model **C402-T**, features a compact size and high-quality reproduction and a swivelling bracket for fixing it is included in the supply.

Using an M6x20 grub screw, as shown in the figure, it is possible to mount two sound columns (of the same type) with one on top of the other; this gives rise to a single sound column of twice the height, with an opening angle on the vertical plan that is further reduced.



This speaker units are certified for use in voice evacuation systems.

Cert. EN54-24 no. 0068/CPR/039-2016

MODEL	C402-T	C420-EN	C430-EN	C440-EN	C460-TW
Rated power	6 W	20 W	30 W	40 W	60 W
Adjustable power	6 / 15 / 3,5 W	20 / 10 / 5 W	30 / 15 / 7,5 W	40 / 20 / 10 W	60 / 30 / 15 / 7,5 W
Sound pressure level SPL Pnom/1m	101 dB	105 dB	108 dB	109 dB	108 dB
Efficiency 1W/1m	94 dB	92 dB	93 dB	93 dB	90 dB
Frequency response	200 ÷ 18.000 Hz	180 ÷ 16.000 Hz	180 ÷ 16.000 Hz	150 ÷ 14.000 hz	130 ÷ 15.000 Hz
Dispersion angle @ 2 kHz	H: 210° V: 140°	H: 150° V: 35°	H: 150° V: 20°	H: 140° V: 20°	H: 150° V: 30°
Protection degree	IP 44	IP 44	IP 44	IP 44	IP 66
Dimensions (W x H x D)	95 x 182 x 78 mm	95 x 520 x 80 mm	95 x 725 x 80 mm	95 x 890 x 80 mm	95 x 520 x 80 mm
Weight	1,2 kg	3,5 kg	4,8 kg	5,65 kg	4,65 kg



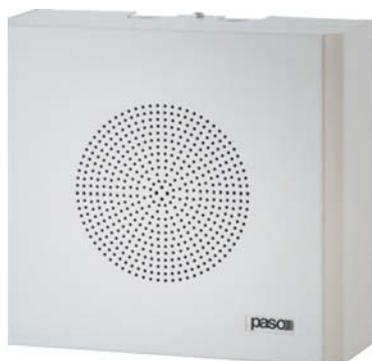
C33/10-T | 10W Flat two-way speaker unit

Flat two-way speaker unit for wall-mounting, in white ABS with metal front grille. Elegant and discreet design with good reproduction of both speech and music. Suitable for any indoor environment. Wall-mounting is quick and easy. A transformer for connecting to constant-voltage lines is included in the supply.

C34-RB, C34-TB | 6W Wall-mounting speaker unit

The speaker units of the **C34** range for interiors consist of a shockproof plastic housing with a white UV-stabilised finish, fitted with a metal grille of the same colour.

These units have loudspeakers with a broad frequency response for excellent reproduction of background music and speech. Both models have transformers for constant-voltage lines. The **C34-RB** speaker unit also has an external step-by-step volume control.



C37/6-EN | 6W Wall-mounting speaker unit 

The **C37/6-EN** speaker unit has been developed specifically for use in a vast range of applications. It can be wall or ceiling-mounted. The structure consists of a particularly strong metal case, matt white powder-coated.

It has a ceramic terminal block and a thermal fuse to ensure safety of the line connecting the loudspeakers in the event that one or more of the speaker units connected to it are damaged by fire.



The C37/6-EN model is certified for use in voice evacuation systems.

Cert. EN54-24 no. 0068/CPR/033-2013

MODEL	C37/6-EN	C34-TB	C34-RB	C33/10-T
Rated power	6 W	6 W	6 W	10 W
Adjustable power	6 / 3 / 1,5 W	6 / 3 / 1,5 W	6 / 3 / 1,5 / 0,75 / 0,3 W	10 / 5 W
Characteristics	Metal	UV-stabilised shockproof plastic housing, metal front grille	UV-stabilised shockproof plastic housing, metal front grille	ABS body, metal front grille
Loudspeakers	1 broadband	1 broadband	1 broadband	1 Wf + 1 Tw
Sound pressure level SPL P _{nom} /1m	99 dB	100 dB	100 dB	99 dB
Efficiency 1W/1m	91 dB	93 dB	93 dB	89 dB
Frequency response	150 ÷ 15.000 Hz	180 ÷ 16.000 Hz	180 ÷ 16.000 Hz	200 ÷ 18.000 Hz
Dispersion angle @ 2 kHz	90°	110°	110°	90°
Mounting	Screws	Screws	Screws	Screws
Colour	White	White	White	White
Dimensions (W x H x D)	210 x 190 x 70 mm	218 x 216 x 120 mm	218 x 216 x 120 mm	185 x 272 x 46 mm
Weight	1,6 kg	1,24 kg	1,24 kg	0,92 kg



C36/6-T
C36/6-EN 
 6 W

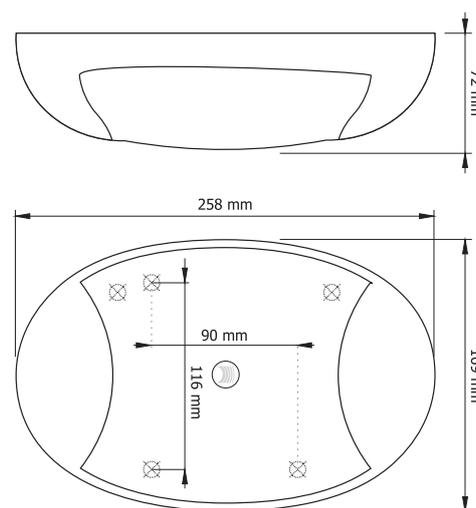


C36/6-2T
C36/6-2EN 
 3+3 W

The speaker units of the **C36** and **C36-EN** ranges, featuring a refined and modern design and ideal for both background music and speech, have been designed specifically for schools, hospitals, waiting rooms, hotels, shops, offices and restaurants.

These speaker units can be either wall-mounted or ceiling-mounted. The housing is made of white self-extinguishing ABS (UL94-V0) with a metal front grille. **C36/6-T** and **C36/6-EN** models each have a loudspeaker with a transformer for constant-voltage lines (50, 70 and 100 V); the output power is adjustable (6, 3 or 1.5 W).

The bi-directional models **C36/6-2T** and **C36/6-2EN**, on the other hand, has two loudspeakers and is particularly suitable for installation in passageways and corridors; Each unit has two 3 W loudspeakers, again with a transformer for constant-voltage lines (50, 70 and 100V) and the output power is adjustable to 6, 3 or 1.5 W. The **-EN** models have a ceramic terminal block and a thermal fuse.



I modelli C36/6-EN e C36/6-2EN sono certificati per l'utilizzo in impianti d'evacuazione vocale.

C36/6-EN Cert. EN54-24 no. 0068/CPR/033-2013

C36/6-2EN Cert. EN54-24 no. 0068/CPR/039-2016

MODEL	C36/6-T	C36/6-2T	C36/6-EN	C36/6-2EN
Rated power	6 W	6 W (3+3W)	6 W	6 W (3+3W)
Adjustable power	6 / 3 / 1,5 W			
Characteristics	ABS UL94-V0 body, front metal grille			
Loudspeakers	1 broadband	2 broadband	1 broadband	2 broadband
Sound pressure level SPL Pnom/1m	95 dB	93 dB	100 dB	93 dB
Efficiency 1W/1m	88 dB	86 dB	92 dB	86 dB
Frequency response	150 ÷ 10.000 Hz	130 ÷ 14.000 Hz	180 ÷ 10.000 Hz	170 ÷ 16.000 Hz
Dispersion angle @ 2 kHz	150°	150° (4 kHz)	110°	H: 35° - V: 120°
Protection degree	IP 32	IP 32	IP 32	IP 32
Mounting	Wall or ceiling mounting, with screws			
Colour	Bianco	Bianco	Bianco	Bianco
Dimensions (W x H x D)	258 x 169 x 72 mm			
Weight	0,8 kg	0,93 kg	0,8 kg	0,95 kg



C94/15-TN
15 W

C94/15-T
15 W

C94/30-T
30 W

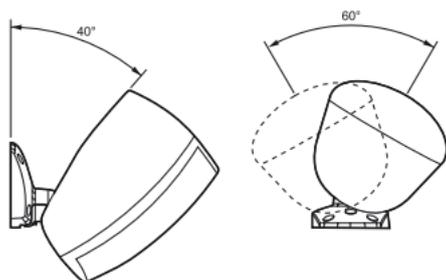
C94/30-TN
30 W

C94/60-T
60 W

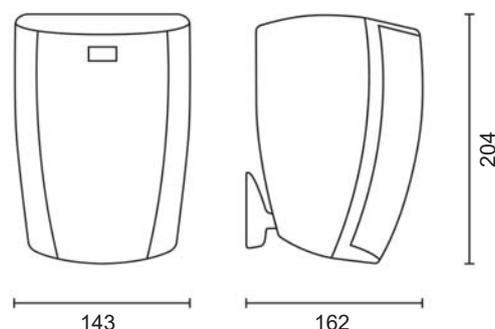
C94 speakers units have been created and designed in Italy. Their exclusive and elegant design allows the loudspeakers to be used for any installations and environment, keeping the same high quality sound throughout.

The **C94** range, made of ABS with a front metal grille, utilizes a compact two-way system guaranteeing high performances, wide dynamics, high fidelity sound reproduction and high voice intelligibility. C94 speakers are equipped with an exclusive fully adjustable support bracket for easy installation, to cut costs and save installation time.

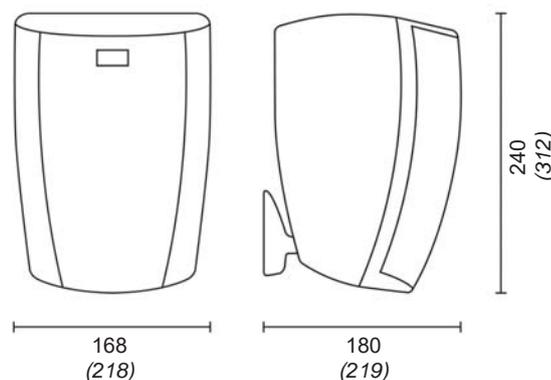
The bracket may be attached to the wall prior to installing the loudspeaker and is provided with a safety cable. Connection to the loudspeakers is via plug in "Euroblock" connector and adjustment of loudspeaker output is made via screwdriver adjustable switch.



C94/15-T, C94/15-TN



C94/30-T, C94/30-TN (C94/60-T)

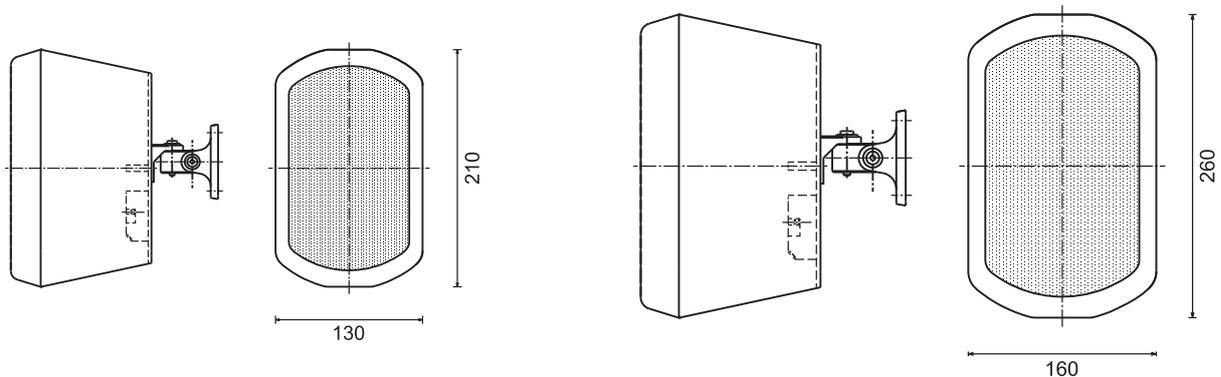


MODEL	C94/15-T	C94/15-TN	C94/30-T	C94/30-TN	C94/60-T
Rated power	15 W	15 W	30 W	30 W	60 W
Adjustable power	15 / 7,5 / 4 / 2 W	15 / 7,5 / 4 / 2 W	30 / 20 / 15 / 10 W	30 / 20 / 15 / 10 W	60 / 45 / 30 / 15 W
Rated impedance	8 Ω	8 Ω	8 Ω	8 Ω	8 Ω
Characteristics	ABS body, front metal grille				
Loudspeakers	1Wf + 1Tw (bass-reflex)	1Wf 6.5" + 1Tw 1"			
Sound pressure level SPL Pnom/1m	100 dB	100 dB	106 dB	106 dB	111 dB
Efficiency 1W/1m	85 dB	85 dB	87,5 dB	87,5 dB	90 dB
Frequency response	100 ÷ 15.000 Hz	100 ÷ 15.000 Hz	85 ÷ 15.000 Hz	85 ÷ 15.000 Hz	70 ÷ 20.000 Hz
Dispersion angle @ 2 kHz	120°	120°	100°	100°	90°
Mounting	Wall (bracket included)				
Colour	White (RAL 9016)	Black	White (RAL 9016)	Black	White (RAL 9016)
Dimensions (W x H x D)	143 x 204 x 162 mm	143 x 204 x 162 mm	168 x 240 x 180 mm	168 x 240 x 180 mm	218 x 312 x 219 mm
Weight	1,5 kg	1,5 kg	2,3 kg	2,3 kg	4,5 kg



The speakers of **C96-EN** range are characterised by a sophisticated design and powerful sound. They are suitable for applications in which high quality sound is necessary.

Each of them is equipped with a high-quality two-way system and with a transformer for constant-voltage lines enabling their power to be adjusted. The shock-proof UV-resistant ABS structure ensures lasting installation of these speaker units, each of which is also equipped with an integrated thermal cutoff. The degree of protection, IP33C, guarantees weatherproofing. Connection is handy and quickly made thanks to a screw-down terminal. Wall-mounting is equally easy with the swivelling bracket included in the supply. They are available in two colours (black or white).



All models of the C96-EN range are certified for use in voice evacuation systems.

Cert. EN54-24 no. 1438-CPR-0581

MODEL	C96/15-EN	C96/15N-EN	C96/30-EN	C96/30N-EN
Rated power	15 W	15 W	30 W	30 W
Adjustable power	15 / 7,5 / 3,75 / 1,8 W	15 / 7,5 / 3,75 / 1,8 W	30 / 15 / 7,5 / 2,5 W	30 / 15 / 7,5 / 2,5 W
Rated impedance	8 Ω	8 Ω	8 Ω	8 Ω
Characteristics	UV-resistant shock-proof ABS	UV-resistant shock-proof ABS	UV-resistant shock-proof ABS	UV-resistant shock-proof ABS
Sound pressure SPL P _{nom} /1m	94,2 dB	94,2 dB	100 dB	100 dB
Efficiency 1W/1m	82,5 dB	82,5 dB	85 dB	85 dB
Frequency response	82 ÷ 23.500 Hz	82 ÷ 23.500 Hz	50 ÷ 23.500 Hz	50 ÷ 23.500 Hz
Dispersion angle @ 2 kHz	H: 132° / V: 115°	H: 132° / V: 115°	H: 101° / V: 133°	H: 101° / V: 133°
Protection degree	IP 33C	IP 33C	IP 33C	IP 33C
Mounting	Swivelling bracket	Swivelling bracket	Swivelling bracket	Swivelling bracket
Colour	White	Black	White	Black
Dimensions (W x H x D)	130 x 210 x 120 mm	130 x 210 x 120 mm	160 x 260 x 152 mm	160 x 260 x 152 mm
Weight	1,70 kg	1,70 kg	2,55 kg	2,55 kg



C1050-TW
50 W



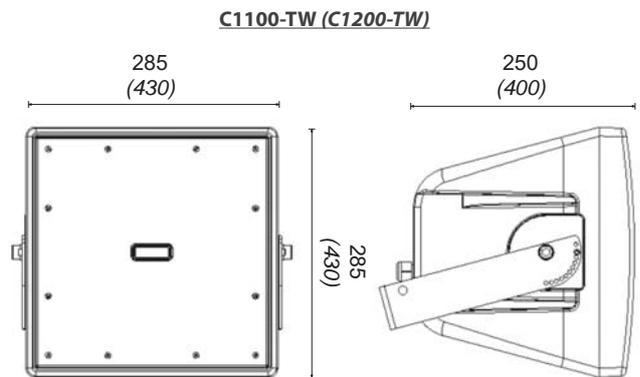
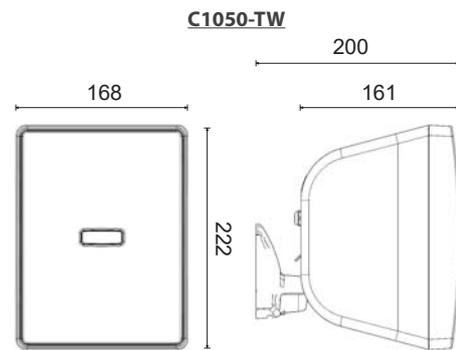
C1100-TW
100 W



C1200-TW
200 W

The two-way **C1000-TW** very high performance speaker units are designed to provide high quality music and voice reproduction in applications with extreme weather conditions resistance, ensuring a long term exposure to all kind of severe environment conditions (IP55 degree).

The curved shape of the **C1000-TW** speaker units helps to reduce acoustic reflections and standing waves within the enclosure, for improved LF performance, and in outside the rounded shape inhibits standing water and helps to diffract wind, reducing load on the structure. The exceptionally weather resistant driver is further protected by the water-stop grille: it stops the elements, solid or liquid, from getting inside the enclosure. Each protective grille is a 3 layers structure that consists of an external perforated stainless steel panel treated with a special protection, a center layer of reticulated foam and an inner layer of water-repellent polyester mesh, providing maximum protection and minimal acoustic attenuation. Both **C1100-TW** and **C1200-TW** provide excellent music and speech reproduction on in a compact enclosure, ensuring a clear intelligibility, with very low distortion also over long distances. Their wide range, smooth frequency response and high efficiency ensure high quality music reproduction and make this units suitable for a variety of applications.



C1050-TW is the most compact model in the **C1000-TW** family. It's built to provide high quality voice and music performance in both indoor and outdoor venues.

MODEL	C1050-TW	C1100-TW	C1200-TW
Rated power	50 W	100 W	200 W
Adjustable power	50 W / 25 W	100 W / 50 W	200 W / 100 W
Rated impedance	8 Ω	8 Ω	8 Ω
Characteristics	UV-resistant polyethylene	UV-resistant polyethylene	UV-resistant polyethylene
Loudspeakers	127mm Wf, 25mm Dome Tw	200mm coaxial Wf / 50mm coil, 25mm HF driver / 36mm coil 90° conical horn.	300mm coaxial Wf / 64mm coil, 1" HF driver / 44mm coil 90° conical horn.
Sound pressure level SPL cont/peak	109 dB / 112 dB	120 dB / 124 dB	124 dB / 128 dB
Efficiency 1W/1m	89 dB	95 dB	98 dB
Frequency response	90 ÷ 20.000 Hz	80 ÷ 20.000 Hz	70 ÷ 20.000 Hz
Dispersion angle @ 2 kHz	100°	90° conical	90° conical
Protection degree	IP 55	IP 55	IP 55
Colour	Grey RAL 7011	Grey RAL 7011	Grey RAL 7011
Dimensions (W x H x D)	168 x 222 x 200 mm	285 x 285 x 250 mm	430 x 430 x 400 mm
Weight	3,5 kg	7 kg	15 kg



C1050-EN 
50 W



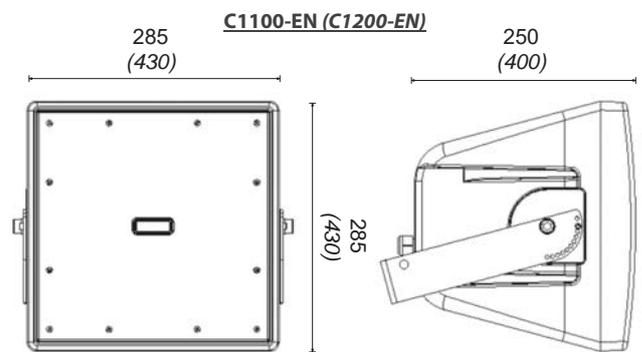
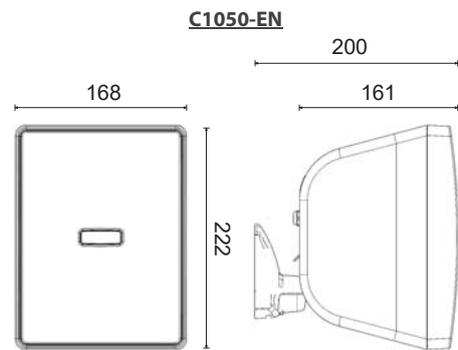
C1100-EN 
100 W



C1200-EN 
200 W

The two-way **C1000-EN** range is suitable for all installations where high intelligibility of alarm messages and excellent sound reproduction are required.

All speakers of the new **C1000-EN** range feature an IP55 and, due to their structure made of self-extinguishing polypropylene with **UL 5VB** flammability rating, are now certified according to **EN54-24** standard. All models of the series have a ceramic terminal block and thermal fuse installed inside to guarantee the protection of the loudspeaker connection line in case of fire. Moreover, all connections consist of fire retardant wires that comply with **EN50200** standard (with IP68 hermetically sealed cable gland). The **C1000-EN** range was designed primarily to provide extreme water resistance. Therefore the metal protective grid was also designed to meet this requirement. The grid consists of three layers with an external stainless steel perforated metallic part treated with a special protection, a central layer with cross-linked foam and a layer formed of a special waterproof polyester mesh. Curves and rounded edges of these speaker reduce acoustic reflections and standing waves inside the box, improving low-frequency performance; they also keep water from settling on the covering and wind diffraction. **All models of the C1000-EN range are EN54-24 certified to be used in voice evacuation systems.**



C1050-EN Cert. EN54-24 no. 0068/CPR/070-2019
C1100-EN Cert. EN54-24 no. 0068/CPR/012-2019
C1200-EN Cert. EN54-24 no. 0068/CPR/012-2019

MODEL	C1050-EN	C1100-EN	C1200-EN
Rated power	50 W	100 W	200 W
Adjustable power	50 W / 25 W	100 W / 50 W	200 W / 100 W
Rated impedance	8 Ω	8 Ω	8 Ω
Characteristics	Self-extinguishing polypropylene structure	Self-extinguishing polypropylene structure	Self-extinguishing polypropylene structure
Loudspeakers	127mm Wf, 25mm Dome Tw	200mm coaxial Wf / 50mm coil, 25mm HF driver / 36mm coil 90° conical horn	300mm coaxial Wf / 64mm coil, 1" HF driver / 44mm coil 90° conical horn
Sound pressure level SPL cont/peak	92 dB / 104 dB	103 dB / 115 dB	108 dB / 120 dB
Efficiency 1W/1m	87,5 dB	94 dB	97,5 dB
Frequency response	100 ÷ 18.000 Hz	94 ÷ 20.000 Hz	68 ÷ 20.000 Hz
Dispersion angle @ 2 kHz	H: 80° / Ver.: 70°	90° conical	90° conical
Protection degree	IP 55	IP 55	IP 55
Colour	Black	Black	Black
Dimensions (W x H x D)	168 x 222 x 200 mm	285 x 285 x 250 mm	430 x 430 x 400 mm
Weight	3,5 kg	7 kg	15 kg



The ideal application for these speaker units is in hospitals, hotels, offices, schools, shops or anywhere where flush-mounting and a discreet and elegant appearance are required.

C41/10-HF | 10W Two-way, flush-mounting speaker unit

Rectangular two-way speaker units for flush-mounting on walls or in false ceilings. Their performance is excellent for reproducing music and speech. They are ideal in refined environments such as wellbeing centres, hotels and conference halls. They are white and made of ABS with a metal front grille. Each speaker unit has a transformer for connection to constant-voltage lines. They are equipped with special hooks for enabling direct installation in false ceilings. For easy flush-mounting in a wall, (optional) AC941 boxes should be used.

C44/6-TB | 6W Rectangular two-way speaker

The C44/6-TB speaker units are made of self-extinguishing plastic material UL94-V0 with a metal front grille and are equipped with a line transformer. The (optional) AC901 box for flush-mounting makes wall-mounting easy and quick.



C44/12-EN | 12W Rectangular two-way speaker



Made of self-extinguishing plastic material (UL94-V0) with a metal front grille, the C44/12-EN speaker unit has a line transformer, a ceramic terminal block and a thermal cutoff. The box for flush-mounting included in the supply enables easy and quick mounting either on a wall or in a false ceiling.



The C44/12-EN model is certified for use in voice evacuation systems.

Cert. EN54-24 no. 0068/CPR/033-2013

MODEL	C41/10-HF	C44/6-TB	C44/12-EN
Rated power	10 W	6 W	12 W
Adjustable power	-	6 / 3 / 1,5 W	12 / 6 / 3 W
Characteristics	ABS body, metal front grille	UL94-V0 ABS body, metal front grille	UL94-V0 ABS body, metal front grille
Loudspeakers	1 Wf + 1 Tw	1 broadband	1 broadband
Sound pressure level SPL Pnom/1m	98 dB	97 dB	98 dB
Efficiency 1W/1m	88 dB	90 dB	87 dB
Frequency response	120 ÷ 20.000 Hz	150 - 13.000 Hz	100 ÷ 20.000 Hz
Dispersion angle @ 2 kHz	170°	120°	Or.: 160° / Ver.: 170°
Mounting	False-ceiling (hole: 118x193 mm) Wall with AC941 flush-mounting box	AC901 optional box for flush-mounting	Flush-mounting wall/ceiling box
Colour	White	White	White
Dimensions (W x H x D)	148 x 222 x 68 mm	165 x 280 x 70 mm	165 x 280 x 85 mm
Weight	1,3 kg	0,83 kg	2 kg

These horn speaker units, featuring a watertight design and intended to guarantee the highest possible level of sound pressure, is particularly suitable for outdoor use even in difficult weather conditions.

TRX20-TW | 20 W round horn speaker, IP66

TRX20-V | 20 W horn speaker, 4 kV insulation transformer

TRX20-EN | 20 W horn speaker, EN54-24 certified

The housing is made of die-cast aluminium with stainless steel screws and brackets, while the horn is made of aluminium sheeting. Each model has a driver unit with a line transformer, a rear switch for selecting the operating power (five positions) and a terminal for correct connection to earth.

The **TRX20-V** model was designed for use in special systems (railways, underground railways etc.), and in addition to a thermal fuse and a flame-proof connecting cable, it also has a line transformer for insulation up to 4 kV.



TRX20-TW
TRX20-V
TRX20-EN 
 20 W, Ø 213 mm



The **TRX20-EN** model is equipped with a thermal fuse that isolates the speaker unit from the system in the event of overheating and with a flame-proof connecting cable (80 cm in length).

This speaker unit is certified for use in voice evacuation systems.

Cert. EN54-24 no. 0068/CPR/033-2013



TR10-TW
 10 W

TR10-TW | 10 W rectangular horn speaker, IP65

The **TR10-TW** horn-type speaker unit has a die-cast aluminium housing and a stainless steel bracket and screws, while the horn is made of shockproof ABS. It has a driver unit with a line transformer and a rear switch for selecting the operating power (four positions).



TR30-TW
 30 W, Ø 259 mm

TR30-TW | 30 W round horn speaker, IP66

The sealed design (class of protection **IP66**) and the materials used make the **TR30-TW** speaker unit particularly suitable for use even in unfavourable climatic conditions, in a saline or polluted atmosphere. It has a driver unit with a line transformer and a rear switch for selecting the operating power (five positions).

MODELLO	TRX20-TW	TRX20-V	TRX20-EN	TR10-TW	TR30-TW
Rated power	20 W	20 W	20 W	10 W	30 W
Adjustable power	20 / 15 / 10 / 5 / 2,5 W	20 / 15 / 10 / 5 / 2,5 W	20 / 15 / 10 / 5 W	10 / 5 / 3 / 1 W	30 / 20 / 15 / 10 / 5 W
Characteristics	Die-cast aluminium body, aluminium horn	Die-cast aluminium body, aluminium horn	Die-cast aluminium body, aluminium horn	Die-cast aluminium body, shockproof ABS horn	Aluminium body and horn
Loudspeakers	Supplied driver unit	Supplied driver unit	Supplied driver unit	Supplied driver unit	Supplied driver unit
Sound pressure level SPL P _{nom} /1m	116 dB	116 dB	116 dB	112 dB	122 dB
Efficiency 1W/1m	103 dB	103 dB	103 dB	102 dB	107 dB
Frequency response	500 ÷ 5.000 Hz	500 ÷ 5.000 Hz	500 ÷ 5.000 Hz	450 ÷ 10.000 Hz	350 ÷ 6.000 Hz
Dispersion angle @ 2 kHz	70°	70°	70°	Or. 100° - Ver. 90°	70°
Protection degree	IP 66	IP 66	IP 66	IP 65	IP 66
Mounting	Swivelling bracket and connecting cable	Swivelling bracket and connecting cable			
Colour	Light grey	Light grey	Light grey	Light grey	Light grey
Dimensions (W x H x D)	Ø 213 x 230 mm	Ø 213 x 230 mm	Ø 213 x 230 mm	176 x 126 x 180 mm	Ø 259 x 261 mm
Weight	1,8 kg	1,8 kg	1,8 kg	1,2 kg	1,75 kg

The particular shape of this speaker units gives rise to practically constant and controlled coverage of the audio spectrum and makes it particularly suitable for any application in which the typical efficiency of horn-type speaker units must be accompanied by a pleasant tone colour and perfect intelligibility.



- TR15HF-EN** | 15 W, two-way horn speaker 
- TR20-HF** | 20 W, two-way horn speaker
- TR40B-HF** | 40 W, two-way horn speaker

These horns are two-way speaker units featuring a high level of efficiency, a wide frequency response range and excellent power-handling capacity. The housing of the speaker unit is made of reinforced polypropylene, self-extinguishing according to UL94-V0. The treble range is reproduced by a horn featuring constant directivity fed by a compression unit for the **TR40B-HF**, and by a dome-type tweeter for the

TR20-HF. The medium-bass range is reproduced in both models by a bent horn fed by a cone-shaped loudspeaker (mid-woofer). A cross-over filter separates the frequencies for the two loudspeakers. Thanks to the built-in repeating coil with sockets for adjusting the output power, these speaker units can be connected to constant-voltage sound-distribution lines (100-70-50 V); a 16Ω connection is also available for low-impedance systems. The particular shape of this speaker unit gives rise to practically constant and controlled coverage of the audio spectrum and makes it particularly suitable for any application in which the typical efficiency of horn-type speaker units must be accompanied by a pleasant tone colour and perfect intelligibility. The design and materials used enable it to be employed for outdoor applications up to class of protection on IP44 at the most. The **TR15HF-EN** model has a thermal cutoff and a flame-resistant cable according to UNI 9795 2010 (length: 80 cm).



The TR15HF-EN model is certified for use in voice evacuation systems.
Cert. EN54-24 no. 0068/CPR/039-2016

The **TR30-HF** horn is a two-way speaker unit featuring high efficiency, a broad response range and good power-handling capacity. The type of construction and the materials used enable it to be used in outdoor applications even in extreme conditions, thanks to the **IP66** class of protection. The housing of the speaker unit is made of reinforced polypropylene. The treble range is reproduced by a horn featuring constant directivity fed by a compression unit, while the medium-bass range is reproduced by a bent horn fed by a loudspeaker (mid-woofer) with a cone made of synthetic material. Thanks to the built-in repeating coil with sockets for adjusting the output power, these speaker units can be connected to 100V constant-voltage sound-distribution lines.

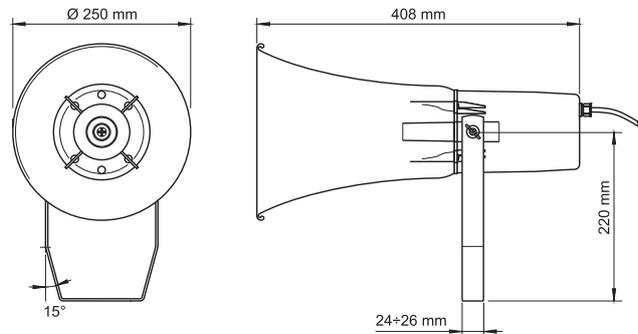


MODEL	TR15HF-EN	TR20-HF	TR30-HF	TR40B-HF
Rated power	15 W	16 W	30 W	40 W
Adjustable power	15 / 8 / 4 W - 16 Ω	16 / 8 / 4 W - 16 Ω	30 / 15 / 7,5 / 3,75 W	40 / 20 / 10 / 5 W - 16 Ω
Characteristics	UL94-V0 self-extinguishing reinforced polypropylene structure			
Sound pressure level SPL Phom/1m	110 dB	116 dB	113 dB	118 dB
Efficiency 1W/1m	98 dB	102 dB	98 dB	99 dB
Frequency response	160 ÷ 20.000 Hz	110 ÷ 20.000 Hz	150 ÷ 13.000 Hz	110 ÷ 17.000 Hz
Dispersion angle @2kHz	H: 30° / V: 60°	H: 45° - V: 80°	H: 35° - V: 65°	H: 45° - V: 80°
Protection degree	IP 44	IP 44	IP 66	IP 44
Mounting	Swivelling bracket and connecting cable			
Colour	White	White	White	White
Dimensions (W x H x D)	335 x 240 x 315 mm	335 x 240 x 315 mm	418 x 332 x 379 mm	335 x 240 x 315 mm
Weight	4,2 kg	4,2 kg	5,7 kg	6,2 kg

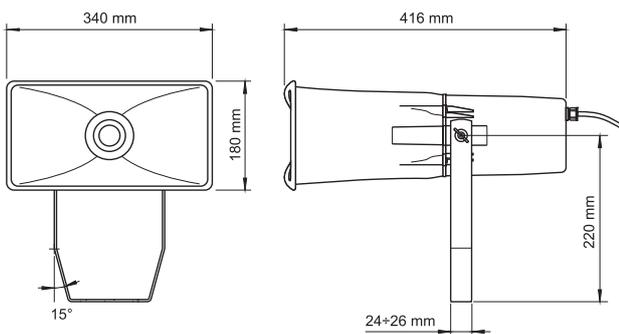
TR1-B, TR2-B and TR3-B exponential horns are made of grey Moplen. They are unbreakable and weather-proof.

Each horn has a swivelling bracket for securing it in place and a rear cap able to contain a **UT35** or **UT60** impedance-type magneto-dynamic unit or a **UT60-T** unit with a 100V transformer, not included in the supply (refer to the appropriate technical table at page 64).

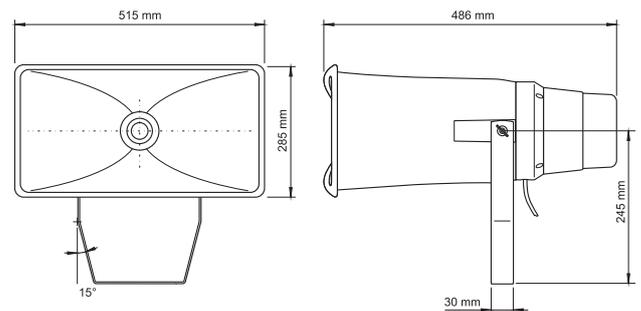
TR1-B | Round exponential horn, IP65



TR2-B | Rectangular exponential horn, IP65



TR3-B | Rectangular exponential horn, IP65



TR400-SX | High-power multiple horn

The **TR400-SX** horn can fit four **UT60** (60 W/16 Ω) or **UT100-B** (100 W/16 Ω) compression units, supplied separately. The sound waves generated by the single units are synchronised when their acoustic pressure is still in the initial expansion phase. Reinforced fibreglass material. Very high efficiency combined with perfect intelligibility of speech. These features make it particularly suitable for powerful sound broadcasting and/or alarm-signalling systems for airports, motor-racing circuits, horse-racing courses, sports fields, etc.

MODEL	TR1-B	TR2-B	TR3-B
Rated power	35 W (*), 60 W (**)	35 W (*), 60 W (**)	35 W (*), 60 W (**/***)
Characteristics	UV reinforced polypropylene structure	UV reinforced polypropylene structure	UV reinforced polypropylene structure
Sound pressure SPL (Pnom/1m)	123 dB (*)	123 dB (*)	125 dB (*)
Efficiency (1W/1m)	108 dB (*)	108 dB (*)	110 dB (*)
Frequency response	350 ÷ 5000 Hz (*)	350 ÷ 5000 Hz (*)	350 ÷ 5000 Hz (*)
Dispersion angle @2kHz	50°	H: 70° - V: 50°	H: 55° - V: 40°
Protection degree	IP 65	IP 65	IP 65
Mounting	Swivelling bracket	Swivelling bracket	Swivelling bracket
Colour	Grey	Grey	Grey
Dimensions (W x H x D)	Ø 250 x 408 mm	340 x 180 x 416 mm	515 x 285 x 486 mm
Weight	1,2 kg (no driver)	1,25 kg (no driver)	2,1 kg (no driver)

* with UT35 | ** with UT60 | *** with UT60-T

MODEL	TR400-SX + UT60	TR400-SX + UT100-B
Rated power	240 W (4 x UT60 units)	400 W (4 x UT100-B units)
Characteristics	Reinforced fibreglass structure	Reinforced fibreglass structure
Sound pressure SPL (Pnom/1m)	135 dB	140 dB
Efficiency (1W/1m)	112 dB	114 dB
Frequency response	150 ÷ 6.000 Hz	100 ÷ 10.000Hz
Dispersion angle @2kHz	H: 125° V: 150°	H: 125° V: 150°
Protection degree	IP 54	IP 54
Mounting	Swivelling bracket	Swivelling bracket
Colour	Grey	Grey
Dimensions (W x H x D)	680 x 410 x 545 mm	680 x 410 x 545 mm
Weight	10 kg (no driver)	

Exponential horn drivers units



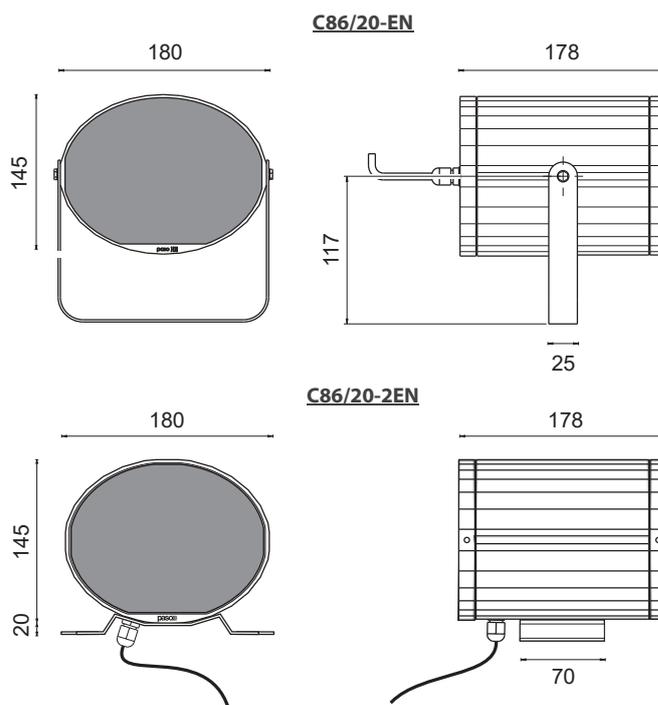
MODEL	UT35	UT60-T	UT60	UT100-B
Rated power	35 W / 16 Ω	60 W (60 / 40 / 20 W), with 100 V transformer	60 W / 16 Ω	100 W, 16 Ω
Characteristics	Per TR1-B / TR2-B / TR3-B		For TR3-B / TR400-SX**	TR400-SX only
Sound pressure SPL (Pnom/1m)	124 dB*	128 dB*	127 dB*	Refer to the above TR400-SX table
Sensitivity (1W/1m)	109 dB*	111 dB*	110 dB*	Refer to the above TR400-SX table
Dimensions (Ø x D)	Ø 105 x 106 mm	Ø 112 x 154 mm	Ø 105 x 106 mm	Ø 124 x 110 mm
Weight	1,3 kg	2,1 kg	1,55 kg	2,02 kg

* with TR3-B | ** For UT60 values with TR400-SX horn, please refer to the above table.



The vandal-proof sound projectors of the **C86-EN** range, thanks to the particularly tough and sealed design, class of protection IP65, this range is especially suitable for use in particularly difficult environmental conditions.

These speaker units feature a grey aluminium housing and yellow-galvanised front grille, tropicalised and stove-enamelled. They have wide-band loudspeakers featuring a high level of acoustic efficiency for excellent reproduction of both voice and music and they're equipped with a transformer for constant-voltage lines and with a thermal cutoff and flame-proof cable (length: 80 cm). These speakers are available in unidirectional or bidirectional versions (**C86/20-EN** and **C86/20-2EN** respectively).



The models of the C86-EN range are certified for use in voice evacuation systems:

C86/20-EN Cert. no. 0068/CPR/033-2013
 C86/20-2EN Cert. no. 0068/CPR/039-2016

MODEL	C86/20-EN	C86/20-2EN
Rated power	20 W	20 W (10+10W)
Adjustable power	20 / 10 / 5 W	20 / 10 / 5 W
Characteristics	Aluminum housing, stainless steel front grille	Aluminum housing, stainless steel front grille
Loudspeakers	1 broadband	2 broadband
Sound pressure SPL (Phom/1m)	105 dB	100 dB
Efficiency (1W/1m)	92 dB	87 dB
Frequency response	150 ÷ 15.000 Hz	150 ÷ 15.000 Hz
Dispersion angle @2kHz	100°	2 x 110°
Protection degree	IP 65	IP 65
Mounting	Swivelling bracket	Fixed bracket
Colour	Light grey body, black front grille	Light grey body, black front grille
Dimensions (W x H x D)	180 x 145 x 178 mm	180 x 145 x 178 mm
Weight	2,4 kg	2,85 kg



C55, C55-S 20 W

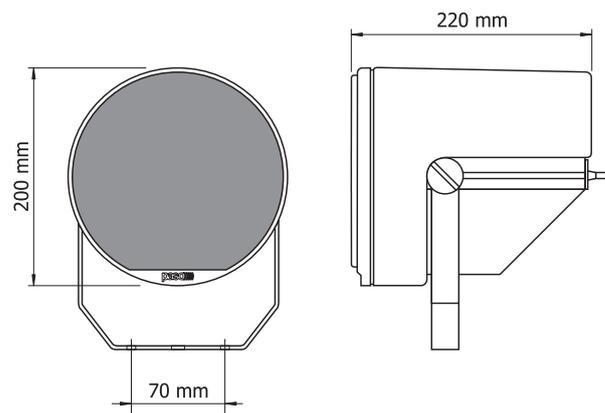
C55-TW 40 W

C55/40-EN 40 W



The **C55 / C55-EN** range projectors are characterised by excellent reproduction of both music and speech, featuring a high sound pressure to ensure a high acoustic performance.

The sound projectors of the **C55** range are made of light grey UV-stabilised ABS, self-extinguishing to UL94-V0. Each unit has a black chromium-plated stainless steel front grille. It has a constant-voltage line transformer and a swivelling fixing bracket that slides along the housing. Models are available for installation in covered areas (**C55**) as well as other sealed units (**C55-S**, **C55-TW**) that can also be installed outside. These projectors are used mainly for directing the sound beam and concentrating it towards a specific area and can be used for innumerable applications. The **C55-TW** uses a wide-band loudspeaker featuring very high acoustic efficiency for excellent reproduction of both voice and music, and it is often used for broadcasting sound along main roads and promenades for tourists.



C55/40-EN model has a ceramic terminal block, a thermal cutoff and a fire-proof cable according to UNI 9795 2010 (length: 80 cm) and is certified for use in voice evacuation systems.

Cert. EN54-24 no. 0068/CPR/039-2016

MODEL	C55	C55-S	C55-TW	C55/40-EN
Rated power	20 W	20 W	40 W	40 W
Adjustable power	20 / 10 / 5 W	20 / 10 / 5 W	40 / 20 / 10 / 5 W - 16 Ω	10 / 20 / 10 W
Characteristics	Self-extinguishing ABS body, stainless steel front grille			
Loudspeakers	1 broadband	1 broadband	1 broadband	1 broadband
Sound pressure SPL (Pnom/1m)	102 dB	100 dB	103 dB	104 dB
Efficiency (1W/1m)	89 dB	87 dB	87 dB	88 dB
Frequency response	150 ÷ 12.000 Hz	150 ÷ 6.500 Hz	100 ÷ 19.000 Hz	100 ÷ 19.000 Hz
Dispersion angle @2kHz	70°	70°	110°	90°
Protection degree	IP 44	IP 66	IP 65	IP 65
Mounting	Swivelling bracket and connecting cable			
Colour	Light grey RAL 7035 body, black front grille	Light grey RAL 7035 body, black front grille	Light grey RAL 7035 body, black front grille	Light grey RAL 7035 body, black front grille
Dimensions (Ø x D)	Ø 200 x 220 mm			
Weight	3 kg	3 kg	3 kg	3 kg



C56/6-T 6 W
C56/12-TW 12 W

These sound projectors have guides that slide along the housing for securing the supporting bracket, thus ensuring handy mounting and correct positioning of the unit during installation.

The **C56 “SUNFLOWER”** range feature High acoustic efficiency and an original and modern design with an ellipse-shaped front. The units are available in versions with an output power of 6 W or 12 W RMS, with a white self-extinguishing ABS structure and a transformer for constant-voltage lines. Thanks to their elegant finish, the **C56** speaker units are suitable for places with special interior decoration requirements such as shops, boutiques, offices and so on.

MODEL	C56/6-T	C56/12-TW
Rated power	6 W	12 W
Adjustable power	6 / 3 / 1,5 W	12 / 6 / 3 W
Characteristics	Self-extinguishing ABS	Self-extinguishing ABS
Loudspeakers	1 broadband	1 broadband
Sound pressure SPL (Phom/1m)	96 dB	99 dB
Efficiency (1W/1m)	88 dB	88 dB
Frequency response	160 ÷ 10.000 Hz	160 ÷ 12.000 Hz
Dispersion angle @2kHz	90°	90°
Protection degree	IP 44	IP 55
Mounting	Swivelling bracket and connecting cable	Swivelling bracket and connecting cable
Colour	White	White
Dimensions (W x H x D)	239 x 156 x 194 mm	239 x 156 x 194 mm
Weight	1,5 kg	1,9 kg

Thanks to the use of excellent wide-band loudspeakers, the sound projectors of the **C48 / C48-EN** ranges are suitable for reproducing both music and speech, and can be used both indoors and outside. Contained in a cylindrical structure made of white self-extinguishing ABS (to UL94-V0), each unit is supplied with a line transformer and with a swivelling bracket to facilitate wall and/or ceiling mounting. Designed to obtain sound emission with very good directivity, they are suitable mainly for installation in transit areas, corridors and in particularly large areas. The sound projectors with the suffix **-TW** are watertight, class of protection IP65, and can therefore also be used in open-air installations. The models with the suffix **-EN** are equipped with a thermal fuse that excludes the loudspeaker in the event of overheating plus a flame-proof connecting cable UNI 9795 2010 (length: 80 cm).



C48/12-TW
C48/12-EN 
12 W, Ø 140 mm

C48/12-2TW
12+12 W, Ø 140 mm

C48/6-2EN 
6+6 W, Ø 140 mm



The models of the **C48-EN** range are certified for use in voice evacuation systems.

C48/12-EN Cert. no. 0068/CPR/033-2013 | **C48/6-2EN** Cert. no. 0068/CPR/033-2013

MODEL	C48/12-TW	C48/12-EN	C48/6-2EN	C48/12-2TW
Rated power	12 W	12 W	12 W (6+6W)	24 W (12+12 W)
Adjustable power	12 / 6 / 3 W	12 / 6 / 3 W	12 / 6 / 3 W	24 / 12 / 6 / 3 W
Characteristics	UL94-V0 ABS	UL94-V0 ABS	UL94-V0 ABS	UL94-V0 ABS
Loudspeakers	1 broadband	1 broadband	2 broadband	2 broadband
Sound pressure SPL (Phom/1m)	99 dB	101 dB	99 dB	98 dB
Efficiency (1W/1m)	88 dB	90 dB	88 dB	87 dB
Frequency response	180 ÷ 15.000 Hz	170 ÷ 13.000 Hz	170 ÷ 14.000 Hz	170 ÷ 12.000 Hz
Dispersion angle @2kHz	160°	100°	120°	140° (*)
Protection degree	IP 65	IP 44	IP 44	IP 65
Mounting	Swivelling bracket and connecting cable			
Colour	White	White	White	White
Dimensions (Ø x D)	Ø 140 x 207 mm			
Weight	1,7 kg	1,7 kg	2 kg	2,2 kg

The **C57** and **C58** ranges of speaker units for installation in false ceilings guarantee excellent reproduction of both speech and music.

They are made of moulded sheet metal treated with white scratchproof and non-reflecting paint and will fit elegantly into any environment. Each unit consists of a load-bearing ring with spring-operated quick-fit hooks for easy securing to the ceiling. The central mask with the loudspeaker cabled to the line transformer fits into the ring by rotating it until it locks into place. It is possible to apply an optional flameproof cap to protect the unit: **AC957** for the **C57-TB** or **AC958** for the **C58/6-TB** and **C58/12-TB**.



C57-TB 6 W, Ø 180 mm
C58/6-TB 6 W, Ø 220 mm
C58/12-TB 12 W, Ø 220 mm



C57/6-EN EN54 6 W, Ø 180 mm
C58/12-EN EN54 12 W, Ø 220 mm

Models C57/6-EN and C58/12-EN, in accordance with EN 54-24, each unit has a galvanised steel flameproof cap, a ceramic terminal block for the connections, a thermal fuse and a terminal for correct connection to earth.



These models are certified for use in voice evacuation systems.

C57/6-EN Cert. no. 0068/CPR/033-2013
C58/12-EN Cert. no. 0068/CPR/033-2013

Thanks to their flat design and limited depth, the **C573/6-EN units** for ceiling mounting are suitable for installation in false ceilings, where very little room is available. Each of them is equipped with a ceramic terminal block, a thermal cutoff and a special PET plastic cap for protection that can be replaced with an optional metal one (**AC973**).



C573/6-EN EN54 6 W, Ø 181,5 mm



The C573/6-EN model is certified for use in voice evacuation systems.

C573/6-EN Cert. no. 1438-CPR-0582

MODEL	C573/6-EN	C57-TB	C58/6-TB	C57/6-EN	C58/12-EN	C58/12-TB
Rated power	6 W	6 W	6 W	6 W	12 W	12 W
Adjustable power	6 / 3 / 1,5 W	6 / 3 / 1,5 W	6 / 3 / 1,5 W	6 / 3 / 1,5 W	12 / 6 / 3 W	12 / 6 / 3 W
Characteristics	Metal structure, PET plastic cap	Metal structure				
Loudspeakers	1 broadband	1 two-cone broadband	1 two-cone broadband	1 two-cone broadband	1 two-cone broadband	1 two-cone broadband
Sound pressure SPL (P _{nom} /1m)	94,6 dB	102 dB	102 dB	99 dB	105 dB	105 dB
Efficiency (1W/1m)	86,8 dB	95 dB	95 dB	92 dB	95 dB	95 dB
Frequency response	57 ÷ 24.000 Hz	100 - 15.000 Hz	80 ÷ 20.000 Hz	100 - 15.000 Hz	80 ÷ 20.000 Hz	80 ÷ 20.000 Hz
Dispersion angle @2kHz	180°	150°	130°	150°	130°	130°
Mounting fixing system	Springs	Springs	Springs	Springs	Springs	Springs
Mounting hole diameter	Ø 160 ÷ 165 mm	Ø 160 ÷ 165 mm	Ø 200 ÷ 205 mm	Ø 160 ÷ 165 mm	Ø 200 ÷ 205 mm	Ø 200 ÷ 205 mm
Colour	White RAL 9016	White	White	White	White	White
Dimensions (Ø x H)	Ø 181,5 x 66 mm	Ø 180 x 110 mm	Ø 220 x 130 mm	Ø 180 x 120 mm	Ø 220 x 140 mm	Ø 220 x 130 mm
Weight	0,69 kg	1,1 kg	1,3 kg	1,5 kg	1,7 kg	1,45 kg



C51/6-T 6 W, Ø 175 mm

MODEL	C51/20-HF
Rated power	20 W
Adjustable power	20 - 10 - 5 - 2,5 W / 8 Ω
Characteristics	ABS body, metal grille
Sound pressure SPL (P _{nom} /1m)	101 dB
Efficiency (1W/1m)	88 ±3 dB
Frequency response	100 ÷ 20.000 Hz
Mounting hole diameter	Ø 170 mm
Colour	White RAL 9016
Dimensions (Ø x H)	Ø 203 x 145 mm
Weight	1,8 kg

C51/6-T ceiling speakers consist of an ABS structure with a RAL 9016 white-painted grille. They feature a compact size and an excellent acoustic performance. Each unit has handy tough spring-type hooks that make it easy to fasten securely to a false ceiling. A transformer for connection to a 100V constant-voltage line is included in the supply, with selectable power-output steps.

The **C51/20-HF two-way ceiling speaker** is made of white ABS, is equipped with a metal grille on the front and offers hi-fi sound quality and excellent power. Equipped with a rear shell, it offers good speech intelligibility and powerful music playback. Its special fastening system allows for a considerable reduction in installation times.



C51/20-HF 20 W, Ø 203 mm



C52/6-T 6 W, Ø 200 mm
C52/12-T 12 W, Ø 200 mm

The **C52 ceiling speakers** are designed specifically for quick installation in false-ceiling panels. They are made of moulded sheet metal with an extremely thin front part. They are ideal for reproduction of both speech and music and are suitable for installation in conference halls, shops and offices. They have strong and handy spring-type hooks making them easy to secure quickly to a false ceiling. Each loudspeaker has a transformer for connection to a 100 V constant-voltage line. The various selectable power steps provide flexibility of installation and the ability to adapt to the acoustic characteristics of different types of room.

The **C53/10-T ceiling speakers** are designed for easy and quick installation in a false ceiling by means of handy spring-type hooks, are made of moulded sheet metal with an extremely thin front part. Their size and the high quality of the loudspeaker used make it ideal for the reproduction of speech and music and suitable for installation in conference halls and medium-to-large shops and offices. A transformer for connection to a 100V constant-voltage line with selectable power-output steps is included in the supply.



C53/10-T | 10 W, Ø 265 mm

MODEL	C51/6-T	C52/6-T	C53/10-T	C52/12-T
Rated power	6 W	6 W	10 W	12 W
Adjustable power	6 / 3 W	6 / 3 / 1,5 W	10 / 5 / 2,5 W	12 / 6 / 3 W
Characteristics	ABS structure, metal grille	Moulded sheet metal	Moulded sheet metal	Moulded sheet metal
Loudspeakers	1 two-cone broadband	1 two-cone broadband	1 two-cone broadband	1 two-cone broadband
Sound pressure SPL (P _{nom} /1m)	100 dB	99 dB	103 dB	102 dB
Efficiency (1W/1m)	93 dB	92 dB	92 dB	92 dB
Frequency response	100 ÷ 15.000 Hz	80 ÷ 15.000 Hz	70 ÷ 20.000 Hz	80 ÷ 15.000 Hz
Dispersion angle @2kHz	150°	160°	80°	160°
Mounting hole diameter	Ø 150 mm	Ø 160 ÷ 165 mm	Ø 230 mm	Ø 160 ÷ 165 mm
Colour	White RAL9016	White	White	White
Dimensions (Ø x H)	Ø 175 x 60 mm	Ø 200 x 62 mm	Ø 265 x 79 mm	Ø 200 x 62 mm
Weight	0,5 kg	0,64 kg	1,2 kg	0,7 kg



C47/6-TB 6 W, Ø 140 mm

C47/12-TW 12 W, Ø 140 mm

The ceiling speakers of the **C47 range** are characterised by their compact size, excellent acoustic performance and peculiar spring-type system for rapid installation. The **C47/6-TB** is suitable for indoor installations, while the **C47/12-TW** is recommended for particularly damp places (bathrooms, kitchens, swimming pools, shelters and so on). Each unit is made of white self-extinguishing material according to UL94-V0 and has a transformer for connection to constant-voltage lines 100 V with selectable power steps.



C49/6-T | 6 W, Ø 200 mm

The **C49/6-T speaker units** for protruded ceiling-mounting are made of white self-extinguishing ABS according to UL94-V0; these units are recommended for all covered places when excellent sound reproduction with an interesting price/quality ratio is required. They can be combined with **C47** units for flush mounting and with projectors of the **C48** range which have a matching appearance from the front.



C470/6-TW | 6 W, Ø 140 mm

The **C470/6-TW speaker units** for installation in false ceilings are white, with an ABS housing and metal protecting grille. The simple and discreet design and good reproduction of both speech and music enable it to fit perfectly into any architectural environment. The simple spring-type fixing system makes installation quick. The built-in transformer enables it to be connected to constant-voltage lines with variable power.

These speaker units are characterised by their compact size and their sealed structure. They are recommended for particularly damp places. They have an ABS rear part, a sealed cable gland and a connecting cable made up of several leads.

MODEL	C47/6-TB	C49/6-T	C470/6-TW	C47/12-TW
Rated power	6 W	6 W	6 W	12 W
Adjustable power	6 / 3 / 1,5 W	6 / 3 / 1,5 W	6 / 3 W	12 / 6 / 3 W
Characteristics	UL94-V0 self-extinguishing ABS structure	UL94-V0 self-extinguishing ABS structure	ABS housing, metal front grille	UL94-V0 self-extinguishing ABS structure
Loudspeakers	1 broadband	1 broadband	1 broadband	1 broadband
Sound pressure SPL (Pnom/1m)	97 dB	97 dB	98 dB	99 dB
Efficiency (1W/1m)	89 dB	89 dB	91 dB	88 dB
Frequency response	110 ÷ 12.000 Hz	110 ÷ 12.000 Hz	150 ÷ 18.000 Hz	110 ÷ 14.000 Hz
Dispersion angle @2kHz	160°	160°	160°	160°
Mounting hole diameter	Ø 109 mm	-	Ø 125 mm	Ø 109 mm
Colour	White	White	White	White
Dimensions (Ø x H)	Ø 140 x 105 mm	Ø 200 x 71 mm	Ø 140 x 130 mm	Ø 140 x 105 mm
Weight	0,75 kg	1,2 kg	0,9 kg	0,95 kg



CSPOT/6-T	6 W, Ø 105 mm	<i>White</i>
CSPOT/6-TN	6 W, Ø 105 mm	<i>Black</i>
CSPOT/6-TS	6 W, Ø 105 mm	<i>Silver</i>

CSPOT ceiling-mounting units are designed specifically to meet the aesthetic requirements of modern interior design. The small size and the shape of the structure of this speaker unit meet the need to camouflage the presence of the loudspeaker among the decorative and/or functional elements of the ceiling, e.g. flush-mounted lighting fixtures. The structure is made of painted metal, making it a tough product with fine construction details. The loudspeaker features an excellent performance in spite of the fact that it is smaller than the usual units for ceiling mounting. Installation in false ceilings is simple and rapidly accomplished thanks to the spring-type hooks. The built-in transformer enables connection to constant-voltage lines with adjustable power.

The spherical units of the **C59** and **C59-EN** range, characterised by an excellent frequency response and ease of use, are suitable for use also in environments that are particularly difficult from the acoustic and plant engineering points of view. They are designed for suspended installation, meeting the requirements of quality sound broadcasting even in large rooms with high ceilings. These elegant and discreet units feature a white ABS structure and are equipped with constant-voltage line transformers with adjustable power plus devices for securing to the ceiling and a 4 m cable (**C59-T**) and 4,5 m cable (**C59/16-EN**).



C59-T
15 W, Ø 202 mm



C59/16-EN 
16 W, Ø 185 mm



The C59/16-EN model is certified for use in voice evacuation systems.

C59/16-EN Cert. no. 1438-CPR-0514

MODEL	CSPOT/6-T	CSPOT/6-TN	CSPOT/6-TS	C59-T	C59/16-EN
Rated power	6 W	6 W	6 W	15 W	16 W
Adjustable power	6 / 4 / 2 W	6 / 4 / 2 W	6 / 4 / 2 W	15 / 7,5 / 3,75 W	16 / 8 / 4 W
Characteristics	Metal structure	Metal structure	Metal structure	ABS	ABS UL94-HB
Sound pressure SPL (Pnom/1m)	95 dB	95 dB	95 dB	100 dB	97 dB
Efficiency (1W/1m)	86 dB	86 dB	86 dB	90 dB	85 dB
Frequency response	100 ÷ 20.000 Hz	100 ÷ 20.000 Hz	100 ÷ 20.000 Hz	70 ÷ 20.000 Hz	130 ÷ 23.500 Hz
Dispersion angle @2kHz	130°	130°	130°	80°	132°
Protection degree	-	-	-	IP 44	IP 21C
Cable length	-	-	-	4 m	4,5 m
Mounting	Hole: Ø 85 mm	Hole: Ø 85 mm	Hole: Ø 85 mm	Hook for ceiling-mounting	Hook for ceiling-mounting
Colore	White	Black	Silver	White	White
Dimensioni (Ø x P)	Ø 105 x 85mm	Ø 105 x 85mm	Ø 105 x 85mm	Ø 202 x 176 mm	Ø 185 x 157 mm
Peso	0,5 Kg	0,5 Kg	0,5 Kg	1,8 Kg	1,58 kg

**TA16-F | 15 W Class 'D' megaphone with Fog Horn**

Simple, lightweight and practical, the **TA16-F** megaphone enables announcements, calls and warnings to be broadcast within a radius of several hundred meters, concentrating the sounds in the required direction. A specific switch, placed on the side, enables the broadcast of particular tones: Fog Horn (F), Whistle (W) and Siren (S). It is made of shockproof material that is rainproof, frost-proof, heatproof and resistant to saline atmospheres. It is equipped with a volume control and a comfortable shoulder strap for carrying.

MODEL	TA16-F
Rated power	15 W
Maximum power	25 W
Power supply	Rechargeable batteries - Size: AA x 10 pcs.
Battery life	~ 12 h (voice)
Battery efficiency	~ 80%
Effective distance	~ 500 m
Microphone type	Dynamic, uni-directional
Dimensions	Ø 203 x 350 mm
Weight (without batteries)	950 g

ACCESSORIES

ATTENUATORS AND TRANSFORMATORS



TL10-RE
TL30-RE
TL60-RE
TL101-RE

The “**Europe**” range attenuators enable the sound level in a room to be adjusted by attenuating the sound performance of the speaker units with a transformer in constant-voltage systems (100, 70, 50 V). Each attenuator has an autotransformer, an 11-position switch (10 positions + Off) and front masks. They are available with different output powers, depending on the load that can be connected to them. Each model (**TL10-RE**, **TL30-RE**, **TL60-RE** and **TL101-RE**) has a by-pass relay able to exclude the attenuator in case of an alarm and/or emergency signal having priority (activation of the relay with a 24 Vdc current on an additional two-pole line). They can be easily flush-mounted on a wall using the **AC911** box or secured to a wall using the **AC913** adaptor.

MODEL	TL10-RE	TL30-RE	TL60-RE	TL101-RE
Rated power	10 W	30 W	60 W	100 W
Attenuation positions	10 + off	10 + off	10 + off	10 + off
Attenuation per step	3 dB	3 dB	3 dB	3 dB
Total attenuation	33 dB	33 dB	33 dB	33 dB
Override command	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Characteristics	ABS structure	ABS structure	ABS structure	ABS structure
Flush-mounting box	AC911 (70 x 70 x 50 mm)			
Wall-mounting box	AC913 (80 x 80 x 50 mm)			
Colour	White	White	White	White
Dimensions (W x H x D)	80 x 80 x 67 mm			
Weight	220 g	260 g	320 g	330 g



The **TLS60-RE selector switch for constant-voltage lines** enables selection of six different programmes from constant-voltage lines, directing them to one or more loudspeakers. It also has a 60 W attenuator with a by-pass relay capable of excluding the attenuator in case of an alarm and/or emergency signal having priority (activation of the relay by means of a 24 Vdc current on an additional two-pole line). It can be wall-mounted using the **AC914** box.

MODEL	TLS60-RE	
Section	Attenuator unit	Selector unit
Rated power	60 W	
Attenuation positions	10 + off	6
Attenuation per step	3 dB	-
Total attenuation	33 dB	-
Override command	24 Vdc	
Characteristics	ABS structure	
Wall-mounting box	AC914 (80 x 155 x 50 mm)	
Colour	White	
Dimensions (W x H x D)	80 x 155 x 67 mm	
Weight	425 g	

The **P8056 6-zone attenuator** is a multiple volume control for 50, 70 and 100 V constant-voltage lines, suitable for rack mounting (1 modular unit). It consists of 6 inductive attenuators with 11 positions each (10 + Off), and each of which can bear a maximum load of 50 W. The six output lines (zones) can be split up into two groups of three each so as to drive them with one amplifier or two separate ones. Each attenuator has a bypass relay for sending out announcements and messages without any attenuation. Each relay requires a 24 Vdc power supply, with absorption of 10 mA. The rear terminal blocks are of the removable type with slide-type fixtures.



MODEL	P8056
Attenuator units and output lines	6
Inputs	2 (IN A for outputs 1-2-3, IN B for outputs 4-5-6)
Attenuator rated power	50 W
Attenuation positions	10 + off
Override command	24 Vdc
19" rack mounting (modular units)	Direct (1 U)
Dimensions (W x H x D)	482 x 44 x 150 mm
Weight	4 kg

FUNCTIONAL FEATURES

- Six 50-W attenuators.
- 6 output lines separable into two groups of three each.
- 2 inputs for constant-voltage lines (one for outputs 1, 2 and 3 and the other for outputs 4, 5 and 6).
- One bypass relay for each attenuator.
- Can be mounted in a standard 19" rack (1 U).

CONSTANT VOLTAGE LINE TRANSFORMERS

TM99-I	Trasformer 50-70-100 V, 4-8 Ohm, 6-3-1,5 W
TM104-I	Trasformer 50-70-100 V, 4-8 Ohm, 4-2-1 W
TM106-I	Trasformer 50-70-100 V, 8 Ohm, 80-40-20 W

CONFERENCE SYSTEMS

PASO conference systems are capable of meeting any need, providing elegant *Made in Italy* solutions.



CONFERENCE SYSTEMS

The secret of a smooth-running and successful conference often lies in the possibility of managing it properly, arranging the contributions in a logical order, controlling their length and the manner in which they are delivered, and requesting and obtaining rapid and clear responses from the meeting with regard to specific issues. All this has to be achieved with perfectly clear and intelligible sound messages.



PASO conference systems are able to meet these needs in a simple and orderly way, providing the right response for any requirements in terms of the system, from the simplest for small discussion groups, to more complex ones for large meetings or conventions (in which up to 100 microphone units can be installed). The **CS2080** system, for discussion only, or the **CS2100** system, for managing conferences calling for electronic voting, are the ideal choices capable of ensuring exceptionally good price/performance ratios.



Simple and elegant desktop design, ABS structure fitted with non-slip feet, extremely user-friendly and rational controls. The stations for **CS2000** conference systems are available in two versions: the **B2080** range for discussion only and the **B2100** range for discussion and voting.





The **CS2100** conference system enables automatic management of up to a maximum of 100 stations. All the activities can be managed through a **CL2100-G** control unit. The available conference modes through which to manage the system are the 'OPEN', 'MANUAL' and 'AUTOMATIC' modes. Participants wishing to speak can queue to do so at any time during the discussion.

In the MANUAL and AUTOMATIC modes, speaking is enabled by the operator (in the manual mode) or on the basis of a pre-set timeout (automatic). Delegate stations are enabled to speak in the order in which they are queued by the central unit. At OPEN conferences, all the stations can speak at the same time. The Chairperson can join a conversation among Delegates or, if necessary, activate the 'Priority' function, placing all the other stations on hold. The heart of the system is the **CS2100** power supply unit, with easy cascade connection of the various units by means of 6 lines of CAT5 shielded cable.

The CS2100 unit has a sophisticated digital controller and is able to manage the sequence of the contributions, electronic voting and the various different alphanumeric displays in the conference hall. At least one **CL2100-G** console is required for configuring the system and the various control activities (the system can include a maximum of four of these units).

The central control unit is able to power up to 100 stations, and has six RJ45 outputs for the various different cascade connections to the microphone stations, consoles and displays (CAT5e SF/UTP cable).

It has two audio inputs ('MIC' and 'AUX IN') for connecting additional sources to the conference, such as wired microphones, wireless microphone receivers or other sources of sound (there is a 12 V phantom power supply for the 'MIC' input).

There are double 'IN' and 'OUT' sockets for connection to a recorder with which to record and play back the discussion. On the front panel there are three separate volume controls (signals from the units, from the 'TAPE' input and from the 'MIC/AUX IN' inputs). The 'BOOSTER OUT' (XLR) output can be used for connecting a power unit for sound broadcasting in the hall.

FUNCTIONAL FEATURES

- Maximum overall number of stations that can be connected: 100.
- Up to 98 Delegate Units: **B2100-DG** for voting, B2080-DG with no voting function and B2080-DG for a secretary (Secretary mode)
- Up to 2 **B2100-PG** Chairperson stations
- Management of the conference mode: Automatic (timeout-based management), Manual (managed by an operator) or Open (simultaneous management of a plurality of stations).
- Up to a total of 4 control console units (**CL2100-G**) for system management.
- Management of electronic open voting or secret ballots.
- Direct enabling of Delegate stations via the control console.
- The Chairperson can speak either in the 'conversation' mode or in the 'priority' mode.
- Easy cascade connections using CAT5 shielded cable.
- Up to 6 connecting lines (max 20 units per line, maximum length of lines from the central unit to the last unit connected: 100 m).
- Up to a maximum of 4 **CT2001** conference hall displays.
- RS232 serial connector for connecting a PC (to the central unit or to the station line using a **CSIF2100** interface).
- Connection of additional sources such as wired microphones, wireless microphone receivers or other sources of sound.
- It is possible to connect a recorder for recording and playing back the discussions.
- Connection to a power unit for sound broadcasting in the conference hall.



The **CS2080** conference system is simple to install, its cost is reasonable and it does not require any programming or any assistance in the conference hall in order to work. It is a discussion system featuring free access, in which the Chairperson or Moderator's microphone has priority. It is suitable for conferences attended by up to 80 people, including the Chairperson.

The heart of the system is the **CS2080** control and power supply unit. It has been designed specifically for managing small discussion-only systems with no need for an operator in the conference hall. Versatility of the output connections and the independent front-panel level controls for each audio signal input are the strong points of this control unit. It can power up to 80 stations and has at disposal four RJ45 outputs for connecting the stations in cascade fashion (using CAT5e SF/UTP cable). There is a 'MIC/AUX IN' input for connecting additional sources to the conference system such as wired microphones, wireless microphone receivers or other sources of sound. It is possible to provide a 12 V phantom power supply for the 'MIC' input. There are double 'IN' and 'OUT' sockets for connecting a recorder.

There is a 'BOOSTER OUT' (XLR) output socket to which a power unit can be connected for sound-broadcasting in the conference hall.

FUNCTIONAL FEATURES

- Maximum overall number of stations that can be connected: 80.
- Up to 79 **B2080-DG** Delegate Stations.
- One **B2080-PG** Chairperson station
- Open conference mode only (simultaneous management of a plurality of stations).
- The Chairperson can speak either in the 'conversation' mode or in the 'priority' mode.
- Easy cascade connections using CAT5 shielded cable.
- Up to 4 connecting lines (max 20 units per line, maximum length of lines from the central unit to the last unit connected: 100 m).
- Connection of additional sources and of an audio recorder.
- Three separate volume controls (signals from the units, from the 'TAPE' input and from the 'MIC/AUX IN' inputs).
- Connection to a power unit for sound broadcasting in the conference hall.

MODEL	CS2100	CS2080	
Conference mode	Conference and voting	Open discussion only	
Maximum overall number of units	2 Chairman units + 98 Delegates units	1 Chairman unit + 79 Delegates units	
Control console unit	CL2100-G (min 1, max 4)	-	
Microphone unit connection lines	6 RJ45	4 RJ45	
Microphone unit connecting cables	CV20xx cables with RJ45 connectors or 31/142-100 (CAT5e SF/UTP shielded cable, 100 m roll)		
Audio inputs	3		
	MIC IN	TAPE IN	AUX IN
Type	Balanced XLR	Unbalanced, 2 RCA	
Sensitivity	1,5 mV	220 mV	125 mV
S/N ratio	65 dB	> 70 dB	
Frequency response	170 ÷ 13.000 Hz	50 ÷ 20.000 Hz	
Audio outputs	2		
'BOOSTER OUT'	Balanced XLR, 420 mV		
'TAPE OUT'	2 RCA, 210 mV		
Serial data output	RS232, DB9	-	
Mains power supply	230 Vac - 50/60 Hz (140 W)		
Dimensions (W x H x D)	482 x 44 x 240 mm (direct standard 19" rack mounting, 1 U)		
Weight	5 kg		



B2100-DG

B2100-DG | Delegate unit with voting

B2100-DG stations enable delegates both to take part in the discussion and to express their votes. With three possible choices: ‘Yes’, ‘Abstained’ or ‘No’. Discretion during the voting is ensured by a cover protecting the three voting keys. Special signalling lamps indicate the following statuses: queued to speak, enabled to speak, timeout and voting accomplished. Each unit is supplied with its own cardioid electret microphone mounted on a 43-cm long flexible stem and a ring that lights up to indicate that it has been activated. Each station also has a push-button for requesting to speak, a built-in loudspeaker that is automatically excluded when the station is active and a volume control. Delegates can also listen to the discussion via headphones or earpieces to be connected to the sockets provided for this purpose (3.5 mm jack). As soon as a jack is connected, the built-in loudspeaker is muted. A double RJ45 socket (IN/OUT) on the rear panel enables cascade connection to the other stations or to the control unit, using CAT5e SF/UTP shielded cable.

B2100-PG | Chairman unit with voting

Each **B2100-PG** unit has the same features described for B2100-DG delegate stations, plus the possibility, using the double key, to join in a conversation or to activate the Priority function. The Priority control excludes off all the other microphones. Like the Delegate Stations, the Chairman’s station also enables voting, with a choice between three possibilities: ‘Yes’, ‘Abstained’ or ‘No’. Each unit is supplied with its own cardioid electret microphone mounted on a 43-cm long flexible stem and a ring that lights up to indicate that it has been activated. Each unit also has a push-button for requesting to speak, a built-in loudspeaker that is automatically excluded when the station is active and a volume control. The chairperson can also listen to the discussion via a headphone or an earpiece to be connected to the socket provided for this purpose (3.5 mm jack). As soon as the jack is connected, the built-in loudspeaker is muted. A double RJ45 socket (IN/OUT) on the rear panel enables cascade connection to the other stations or to the control unit, using CAT5e SF/UTP shielded cable.



B2100-PG

CL2100-G | Control console unit

The CS2100 control unit for configuring the system and performing the various control activities requires at least one **CL2100-G** console (up to a maximum of four can be installed). This unit enables programming and complete management of the discussion, of voting and, if required, activation of a speaker’s station (**B2100-DG** and/or **B2080-DG**) without queuing.

The backlit LCD display shows the statuses of the microphones (ID number of the currently active microphone, of the next one in the queue and number of speakers queued to speak) and the result of the voting (total number of people voting Yes, number voting No and number Abstaining). There is a double RJ45 socket (IN/OUT) for direct connection to the control unit or for cascade connection to the other stations. The console has all the controls needed for easy and immediate use (numerical 0-9 keypad, key for selecting the conference mode, key for starting/ending the voting, key for continuing the discussion, menu key for selecting the language, selecting the length of the contributions in the automatic mode and selecting the service functions).



CL2100-G

B2080-DG | Delegate unit for open conference

Each **B2080-DG** station enables the delegate to take an active part in the discussion and to listen clearly to the contributions of the other speakers via the built-in loudspeaker or via an external headphone. Each unit is supplied with its own cardioid electret microphone mounted on a 43-cm long flexible stem and a ring that lights up to indicate that it has been activated. Each station also has a push-button for requesting to speak, a built-in loudspeaker that is automatically excluded when the station is active and a volume control. Delegates can also listen to the discussion via headphones or earpieces to be connected to the sockets provided for this purpose (3.5 mm jack). As soon as a jack is connected, the built-in loudspeaker is muted. A double RJ45 socket (IN/OUT) on the rear panel enables cascade connection to the other stations or to the control unit, using CAT5e SF/UTP shielded cable.



B2080-DG

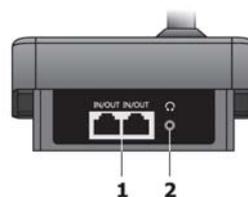


B2080-PG

B2080-PG | Chairman unit for open conference

Each **B2080-PG** unit has the same features described for B2080-DG delegate stations, plus the possibility, using the double key, to join in a conversation or to activate the Priority function. The Priority control excludes off all the other microphones. Each unit is supplied with its own cardioid electret microphone mounted on a 43-cm long flexible stem and a ring that lights up to indicate that it has been activated. Each unit also has a push-button for requesting to speak, a built-in loudspeaker that is automatically excluded when the station is active and a volume control. The chairperson can also listen to the discussion via a headphone or an earpiece to be connected to the socket provided for this purpose (3.5 mm jack). As soon as the jack is connected, the built-in loudspeaker is muted. A double RJ45 socket (IN/OUT) on the rear panel enables cascade connection to the other stations or to the control unit, using CAT5e SF/UTP shielded cable.

NB.: a B2080-DG microphone station can be used with the CS2100 system to act as “non-voting” delegate or, if suitably configured, as a Secretary, with the possibility of stepping in directly without having to queue to speak.



1. Input/output connectors.
2. Socket for headset.

MODEL	CL2100-G	B2100-DG	B2100-PG	B2080-DG	B2080-PG
Conference mode		Conference and voting		Open conference only	
Unit type	Control console unit	Delegate	Chairman	Delegate	Chairman
Suitable central control unit		CS2100		CS2100, CS2080	CS2080
Microphone	-	43-cm long stem flexible at the base, electret microphone			
Digital display	16 digits x 2 lines	-			
Headset output	-	Stereo jack type outlet (3.5 mm)			
Connecting plugs		2 x RJ45			
System connecting cables	CV20xx cables with RJ45 connectors (not included) or 31/142-100 (CAT5e SF/UTP shielded cable, 100 m roll)				
Mounting	Desktop (AC700 fixing mounting optional kit)				
Dimensions (W x H x D)	116 x 32 ÷ 60 x 200 mm		116 x 32 ÷ 60 (490 with microphone) x 200 mm		
Colour	Light grey				
Weight	0,5 kg		0,6 kg		



CT2001

CT2001 | Conference-hall display panel

The conference-hall display shows the delegates and the public the main information concerning the conference being held. At the end of a voting session, it indicates the total number of people voting Yes, number voting No and number Abstaining. During the discussion (except in the case of 'OPEN' conferences), it shows the ID number of the microphone of the speaker that is currently enabled to speak, that of the next speaker in the queue and the total number of speakers queued to speak. The **CT2001** is an alphanumeric display with fixed fields and showing interchangeable texts. It has two RJ45 (IN/OUT) sockets for direct connection to the control unit or cascade connection to the other stations (using shielded CAT5e SF/UTP cable). **With the CS2100 system it is possible to install up to four CT2001 units.**

CSIF2100 | Remote interface to connect a PC

The **CSIF2100** interface can be used to connect a Personal Computer loaded with the control software at any point of the network connecting the microphone stations of the **CS2100 system**. It has a double RJ45 (IN/OUT) socket for direct connection to the control unit or cascade connection to the other stations (using shielded CAT5e SF/UTP cable). There is a DB9 socket enabling an RS232 serial link to the personal computer. All the electronics are contained in a small metal box screwed to the unit. The circuit board is powered directly from the network connecting the system to the control unit.

MODEL	CT2001
Panel type	3 fixed fields, 2 ½ digits each field
Lamps	Red LEDs
Suitable central control unit	CS2100
Connecting plugs	2 RJ45
System connecting cables	CV20xx cables with RJ45 connectors or 31/142-100 cable (CAT5e SF/UTP shielded cable, 100 m roll)
Mains power supply	230 Vac - 50/60 Hz
Dimensions (W x H x D)	1050 x 500 x 40 mm
Mounting	Wall mounting (accessories non included)
Weight	20 kg

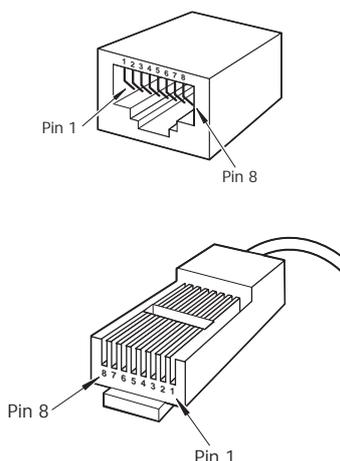
MODEL	CSIF2100
Suitable central control unit	CS2100
Connecting plugs	2 RJ45
System connecting cables	CV20xx cables with RJ45 connectors or 31/142-100 cable (CAT5e SF/UTP shielded cable, 100 m roll)
Serial data output	RS232, DB9
Mounting	Metal housing with screw fixing
Dimensions (W x H x D)	136 x 26,5 x 95 mm
Weight	400 g

CS2000SYSTEMCONNECTIONS

UNITS input (RJ45)

All connectors must be shielded RJ45 type.

PIN	DESCRIPTION
1	Audio +
2	Audio -
3	GND
4	AP line -
5	AP line +
6	+Vdc
7	Serial+
8	Serial-
Shield	GND



CONNECTING CABLES

The connecting cables are not included in the supply of the stations and must be purchased separately, choosing from among the various available lengths: codes **CV2002** (length 2 m), **CV2005** (length 5 m) and **CV2010** (length 10m). It is possible to make connections of lengths other than these using only **31/142-100** type cable, available in 100-m bundles. All the connectors must be RJ45 connectors of the shielded type and the connecting cables must be CAT5e SF/UTP cables.

CV2002	CAT5e SF/UTP shielded cable, 2 m, RJ45 connectors
CV2005	CAT5e SF/UTP shielded cable, 5 m, RJ45 connectors
CV2010	CAT5e SF/UTP shielded cable, 10 m, RJ45 connectors
31/142-100	CAT5e SF/UTP shielded cable, 100 m roll

CENTRAL CONTROL UNIT SYSTEM	CS2080	CS2100
Conference mode	Only open conference	Manual, Automatic, Open and Voting
Chairman units	1	2
Delegate units	79	98
Chairman unit for open conference	B2080-PG	-
Delegate unit for open conference		B2080-DG
Chairman unit with voting	-	B2100-PG
Delegate unit with voting	-	B2100-DG
Control console unit	-	CL2100-G (min. 1, max. 4 units)
Management by Personal Computer and dedicated SW	-	RS232 serial line connection with shielded cable
Microphone unit connection lines	4 RJ45	6 RJ45
Maximum overall number of unit for each line	Max 20 units per line (max line length from the central unit to the last unit connected: 100 m)	
Audio outputs	2 line outputs (for sound broadcasting in the conference hall and for audio recording)	
Audio inputs	1 microphone input and 2 line inputs (TAPE and AUX)	
ACCESSORIES	CS2080	CS2100
Conference-hall display panel	-	CT2001 (max 4)
Fixing mounting kit for microphone units		AC700
Remote interface to connect a PC with dedicated SW	-	CSIF2100, to connect a Personal Computer at the network of the microphone units of the system
Cables with RJ45 connectors	CV2002 (2 m), CV2005 (5 m), CV2010 (10 m)	
100 m roll cable	31/142-100, CAT5e SF/UTP shielded cable, 100 m roll	



EASY CAT5 CONNECTION

One of the strong points of the PASO CS2000 system is the extreme simplicity with which it is installed and connected up. A single cable distributes power, data and the audio signal. Each station has a double RJ45 socket (IN-OUT) on the rear panel to enable easy cascade connection using CAT5 shielded cables. There are no constraints of any kind in terms of the physical positions of the stations within the systems. The Delegate and Chairpersons Stations, the conference hall display and the interface for connecting a remote PC can be positioned anywhere in the network connecting them to the central control unit.



A photograph of architectural blueprints spread out on a table. Several hands are visible, some holding drafting tools like a pencil and a ruler. The blueprints show various floor plans and site layouts. Labels like 'LOBB', 'OFFICE', 'CLASS', and 'MENS' are visible on the drawings. The entire image has a light green tint.

APPENDIX

Design rules

Application examples

Sound broadcasting systems are present in a wide range of spaces, and the reasons for their installation are many and varied:

- 1) voice amplification for broadcasting in spaces other than that in which the speaker is located (hospitals, communications or calls in buildings, airports, sports centres, railway stations, underground stations, etc.).
- 2) backup voice or music amplification (meeting and conference rooms, open-air speeches and events, churches, public entertainment venues, etc.).
- 3) playback of background music with the option of inserting alerts or calls over the loudspeaker, either overlapping or temporarily muting the music (large stores and supermarkets, parks and public gardens, seafront and lakeside promenades, spas or industrial facilities, shops of various kinds, etc.).
- 4) voice and music amplification aboard or outside mobile vehicles (tourist or regular buses, train carriages, private or cruise ships, advertising vehicles, markets, etc.).
- 5) playback of music in different spaces (private homes, communities, retirement homes, hotels, etc.).

But the sound broadcasting system can also prove useful in less pleasant or common situations: indeed, in an emergency it can prove crucial to assisting communications for the management of an orderly evacuation of people from a dangerous place.

THE STRUCTURE OF THE SYSTEM

Sound installations, especially if they are complex and require high levels of security and flexibility, increasingly require integration with sophisticated systems allowing for management and control of the various components, flexible selection of inputs and outputs, and interfacing with external peripherals. It is clear that each application will require some very different types of equipment in terms of their nature and characteristics, but essentially, every sound broadcasting system must consist of three basic elements:

- **The microphone:** transforms the sound vibrations into electrical oscillations, thus allowing for the transmission and amplification of the sound. Even musical sound sources such as CD/USB/SD card players, radio tuners or satellite receivers generate electrical signals using devices capable of reading and translating information stored on different types of media, or receive and convert very high-frequency electromagnetic waves into electrical signals, or even demodulate a complex electrical signal.
- **The amplifier:** receives a small low-energy oscillation from the sound source at the input, then, through gradual increases performed by means of several stages of "amplification", sends it to the output amplified to much higher levels. The ratio of the output level to the input level is called "gain". A volume control allows you to set the level of gain from 0 (zero) to the rated power.

- **The loudspeaker:** converts the electrical signal coming from the amplifier into a sound signal, making it possible to listen to the amplified sound.

Microphone, amplifier and loudspeaker are the three elements that form the basis of any sound system.

The choice of models, how they are combined and where they are located are all essential factors in the success of the entire sound broadcasting system.

THE MICROPHONE

The microphone converts the vibrations in the air, generated by sounds and noises, into electrical signals. It is a very important "instrument" because it is the starting point for the entire amplification process.

• Magneto-dynamic microphone

The magneto-dynamic microphone is the most commonly used type due to its good quality, solid structure - which is largely unaffected by the influence of atmospheric humidity - and its low cost in relation to its performance.

In this type of microphone, it is the diaphragm that moves, oscillating under the pressure of sound waves, and it is joined to the coil, which moves in the air gap of a permanent magnet. At the ends of the coil, a voltage is formed that is proportional to the intensity of the sound pressure acting on the diaphragm itself (because it is proportional to the speed at which the coil moves).



M940

• Electret or capacitor microphone

This type of microphone requires a power supply in order to work, as it works based on the principle of the capacitor and is made up of two armatures, one of which constitutes the diaphragm. When subjected to sound vibrations, this diaphragm modifies the distance between the armatures, giving rise to variations in capacitance.



MC260

Considering that a direct voltage is applied to the two armatures, the charge and discharge currents cause variations in voltage at the ends of a resistor which are proportional to the displacement of the diaphragm and, therefore, to the original sound pressure as well. To compensate for the low output voltage which is typical of this microphone, it is necessary to combine it with a preamplifier that raises the output signal, resulting in an excellent level of sensitivity. As such, it is easy to imagine why this microphone needs to be powered by a mini-battery or a direct power supply from the amplifier, known as 'phantom' power, which is sent to the microphone using the same cables that the signal passes through.

PERFORMANCE

In order to be able to express a valid judgement on the performance of a given microphone, it is essential to evaluate its quality, directivity and sensitivity.

- **Quality:** it is considered excellent if the frequency response, i.e. the ability to faithfully reproduce the entire spectrum of audible frequencies, has a very wide range and its characteristic has as linear a progression as possible. This will provide the suitable conditions for the fidelity of the playback to also be at its best.
- **Directivity:** the most widely-used microphones in PA systems are those with cardioid polar curve (so called because the curve forms a "heart" pattern) because they are sensitive to the sounds that reach them from the front whilst rejecting those that come from the sides. They minimise the possibility of picking up unwanted sounds or amplifying the sound coming from the speakers, which would generate a very annoying acoustic 'whistle' (Larsen effect).
- **Sensitivity:** the sensitivity of a microphone is expressed in mV/Pa. The higher the sensitivity, the higher the output voltage, at the same level of sound pressure acting on the membrane. A higher output voltage means that the microphone input is better able to reach the amplifier, even when dealing with relatively long microphone-amplifier connection lines. It is therefore possible to install the microphone further away whilst maintaining the same performance.

BALANCED LINE AND UNBALANCED LINE

The connection between the microphone and the preamplifier can be made with a balanced line or an unbalanced line. The unbalanced line is made up of two-pin connectors and a shielded-conductor coaxial cable with a sheath; the balanced line, on the other hand, is made up of three-pin connectors and a cable with two connectors shielded by a sheath.

In the *balanced* connection, the signal runs down the two wires shielded by the sheath, and even if the microphone is located far from the preamplifier, the connection is guaranteed to be free from external noise. When connecting the microphones, due to the small size of the signal coming from the capsule, it is recommended to use a balanced connection to connect to the preamplifier. The signal runs from the capsule to the amplifier over two totally protected wires, allowing for longer cables and secure connections.

In the *unbalanced* connection, on the other hand, the negative pole of the microphone capsule is connected to the same sheath as the cable and as such, the signal does not have any kind of proper shield (in the case of a long cable, we would be connecting a huge antenna capable of picking up any external noise to the system).

THE AMPLIFIERS

The purpose of the amplifier is, as the name would suggest, to amplify all the signals that are supplied to it via the input, in order to transform them into an electrical audio output that can be sent to all the loudspeakers that make up the sound system. The preamplifier, meanwhile, has the task of managing the signals that come from the sources, mixing them, equalising them, "processing" them and directing them to the power amplifier.

Integrated amplifiers incorporate both the preamplifier and the amplifier in a single unit. Generally speaking, only low- and medium-power devices are integrated.

Where high power or multiple cascade amplifiers are required, the use of separate equipment is always recommended. This results in a system that is not only more powerful, but also higher-quality, because the various sections use separate power supplies, are shielded from each other and usually, the preamplifier has more functions and inputs than the 'pre' section of an integrated amplifier. It is also possible to connect external signal processors (equalisers, feedback suppressors or automatic volume controls) directly to an integrated amplifier. The connection between the preamplifier, the signal processors and the amplifier can be made with a balanced line or an unbalanced line.



AX3500 range

The key parameters to take into consideration when choosing an amplifier are:

- **Power:** the rated power must never be lower than what is actually required by the speakers; this means that the amplifier is always working well within its limits and allows for the option of adding other speakers at a later date (always ensuring that the unit is not overloaded by exceeding its rated power).
- **Inputs:** the type and number of inputs installed are evaluated during the design phase and will differ according to the type and number of sound sources (microphones, recorders, tuners, CD players, etc.) that are connected to the system..
- **Protection:** ensures the safety of the amplifier in case of overloads and/or short circuits on the output line. It is advisable to use feedback amplifiers, which are equipped with an automatic control circuit that keeps the operation of the final power stages in a safe area.

AUDIO SPEAKERS AND LOUDSPEAKERS

The loudspeaker is the last link in the chain and is the element in the sound broadcasting system that transforms the electrical signals that are "strengthened" by the amplifier into mechanical vibrations to be transmitted into the air, so as to reconstitute the amplified sounds and allow them to reach the ears of the listeners. There are many types of audio speakers, but for simplicity's sake, the following list will only mention those most commonly used in sound broadcasting systems.

Types of speakers

- **Ceiling speakers:** these are speakers which are installed by creating a suitably-sized hole in a ceiling panel, allowing the bulk of the speaker to be placed inside the ceiling and neatly embedded in the hole; some of them have the loudspeaker visible, allowing it to make use of the ceiling cavity as an enclosure, whilst others may be protected by fireproof shells.
- **Wall speakers:** these are installed on the wall and often use supplied brackets and/or optional supports that allow for them to be oriented as desired, leaving them in view and entirely protruding.
- **Column speakers:** the particular arrangement of the loudspeakers in this instance - namely one on top of the other - allows them to provide an increasingly narrow vertical spread of the sound (with an increased number of speakers), making them effective as part of sound systems for spaces with very high ceilings and high reverberation. In churches, for example, where the ceiling is often dome-shaped and there is a great deal of reverberation, the only way to maintain good speech intelligibility is to install this type of speaker.
- **Sound projectors:** wall- or ceiling-mounted speakers whose distinctive construction allows the user to direct the sound, thus 'projecting' it farther than a traditional diffusion speaker.
- **Horn speakers:** a compression speaker where the loudspeaker itself is a dome-shaped membrane, with no enclosure and exceptional efficiency; its distinctive construction allows for it to be installed in outdoor spaces.



Ceiling-mounting speaker
C53/10-T



Wall-mounting speaker
C36/6-2T



Sound column
C430-T



Sound projector
C55-TW



Horn speaker
TRX20-TW

The characteristics that denote the quality of a loudspeaker are as follows:

- **Frequency response:** the ideal response should be a curve which remains 'flat' across the entire range of audible frequencies, and even a little further. In reality, we are often satisfied with much less, i.e. a curve that varies by no more than 4dB from about 40Hz up to 5kHz.
- **Dispersion:** the uniform diffusion angle in front of the loudspeaker is known as the "coverage angle". This angle coincides with the points beyond which the power level drops by more than 6dB compared to the power along the front axis. This angle is usually between 60° and 90° wide. All the power that falls beyond this angle is considered "dispersed", and causes disadvantages, especially in the case of complex systems with many speakers.
- **Efficiency (sensitivity):** this is defined as the sound pressure produced by a loudspeaker at a distance of 1m when driven by 1W of power.
- **Peak power handling:** this defines a loudspeaker's capacity to reproduce high levels of sound without introducing distortion and without being damaged itself.
- **Impedance:** each loudspeaker has its own impedance curve, depending on the frequency. What is referred to as a certain speaker's 'impedance' is the value at 1,000Hz, and this does not coincide with the ohmic resistance of the coil. The typical impedance of a loudspeaker can be 4/8/16 Ω. In constant voltage systems, this impedance is always increased by means of an impedance transformer.

In sound broadcasting systems of a certain quality, the use of single loudspeakers is eschewed in favour of sets of loudspeakers (woofers for the basses, *mid-ranges* for the intermediate frequencies and tweeters for the higher frequencies) mounted in special cabinets which use a series of arrangements to contribute to the overall performance of the audio system.

FOREWORD

When a room is designed from the acoustic point of view, it is advisable to consider, first and foremost, the speaker units. Following this, the power and the model of the amplifier have to be defined, and lastly the sources of sound and the most suitable system for connecting the loudspeakers have to be chosen. It is possible to identify 6 basic steps to be followed:

- 1) Determining the functions required of the system starting out from the user's needs (microphone messages, background music, emergency announcements, etc.).
- 2) Analysing the environmental characteristics of the areas in which to broadcast sound: if they are outdoor areas, it is important to measure the existing noise and also to determine the highest level that the sound-broadcasting system can reach without disturbing neighbouring activities; if indoors, it is necessary to investigate the acoustic criticality of the rooms, e.g. by measuring reverberation.
- 3) Choosing the speaker units on the basis of the type and size of the room involved, of the type of information to be broadcast (speech and/or music), of the noise level in the room and of its acoustic characteristics. The type of speaker unit will differ depending on whether they are ceiling-mounted or wall-mounted: the sound level they must be able to reproduce must be a function of the ambient noise. In addition, the power output required of the amplifier in order to achieve a level able to ensure proper intelligibility of the message will depend on its efficiency. Attention also has to be paid to the directivity of the speaker units, which becomes particularly important if there is any reverberation in the rooms.
- 4) Opting for a suitable amplifier for the speaker units as a whole, with a sufficient number of inputs to cater for all the sources of sound; if the system has to include emergency services, it will be necessary to use a system meeting the specifications indicated in the applicable standards according to the law.
- 5) Defining the sources of sound such as the microphones, wireless microphones, microphone consoles, wireless tuners, CD players, MP3 players, and which of them must cater for emergency services.
- 6) Evaluating the manner of connecting the speaker units, depending on whether they have a constant impedance (4, 8, 16 Ω) or a constant voltage (100, 70, 50 V) and determining the cross-section and type of the cables. The great majority of installations require many loudspeakers and therefore constant-voltage systems offer undisputable advantages in terms of the cross-section of the leads (and therefore of purchasing and laying them) and of simplicity of installation.

It is also worth bearing in mind that the quality of an amplification system can only be as high as that of the component in the sound system chain with the weakest characteristics. For example, if we equip a system with a high-quality sound source and then insert loudspeakers that are not suitable for the characteristics of that source, the end result will be a sound broadcasting system of a quality limited to that of the loudspeakers. It is therefore advisable to ensure that all the components of a sound system are at the same level of quality. The space is also a link in the sound amplification chain, and it is therefore fundamentally important to design it very carefully.

A room which has a poor acoustic profile will never allow a sound system to provide satisfactory results. It is only by taking action in advance, making substantial changes, or at least changes of a certain magnitude (architectural constraints permitting), to all of the elements that contribute to improving the acoustics of the space, such as the furnishings, walls and upholstery, that significant results can be obtained. It is equally important for the performance of the chosen speakers, as well as their quantity and placement, to be suitable for the space in which they will be located, especially to ensure that announcements can be properly understood and important instructions - for example, in case of an emergency - are not compromised.

For an outdoor sound system, the system's power of diffusion must generally be greater than in an indoor environment (for the same type of sound system), both because the sounds are generally more muffled, and because in the open air, there are likely to be unwanted foreign noises that can compromise the proper intelligibility of the sounds themselves. Outdoor sound systems usually make use of exponential horns or waterproof sound projectors, whose construction makes them better suited to these usage scenarios (as they are rainproof and resistant to sunlight and frost). For indoor environments, cabinet loudspeakers, ceiling speakers and/or column speakers can all be used, also taking into consideration any architectural, functional or purely aesthetic limitations of the space in question. In industrial or very noisy environments, for communications or voice calls, small exponential horns, which have directional characteristics, can be useful for concentrating the sounds in certain points of the space.

In the case of mixed areas, it is advisable to provide two separate sound systems, one for the outdoor part and the other for the indoor areas. The relevant equipment can, of course, be grouped together, mounting amplifiers, tuners, recorders, etc. in a single cabinet.

By adopting such a solution, it will then be possible to vary the sound broadcasting levels of the two networks at any time, as required, and even broadcast from different sources inside and outside, if desired.

BROADCASTING AND SPEAKER UNITS POSITIONING

The **multi-point broadcasting** enables the best possible intelligibility of music/announcements as it ensures that the sound is broadcast more evenly, and is achieved using a suitable number of sound-output points, that must be correctly distributed (best if ceiling-mounted) and driven by lower power levels. In this way, even if the environment is reverberating, working with single low volume levels is the best way to avoid causing annoying acoustic resonance effects.

Broadcasting with ceiling-mounted fixtures

It is a known fact that ceiling-mounted loudspeakers (sound ceiling) are the best way of broadcasting sound for announcements and background music. In some circumstances this may not be feasible, due for example, to the height or particular structure of a ceiling. This type of system is more expensive than broadcasting via only a few points, however broadcasting from above has many advantages, and this type of broadcasting should always be considered before any other alternatives.

This type of sound system allows for maximum uniformity and the lowest probability of causing reverberations in the space, since it is possible to work with low unit levels of sound energy. This is because the ceiling speakers are equidistant from the listening area. Once it has been decided what type of ceiling-mounted speaker units to install, and the angle of coverage of the single speakers units is known, calculating the number of speaker units to use, starting out from the height of the ceiling and the surface area of the room, is a simple matter.

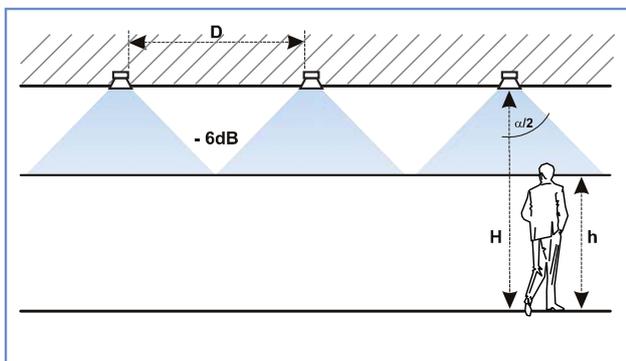


Fig. 1

The distance **D** between the centre of one loudspeaker and the next (see Fig.1), is obtained using the following formula:

$$D = 2 \cdot (H-h) \cdot \tan(\alpha/2)$$

where:

H = height of ceiling;

h = height of listening point;

α = angle of dispersion of the speaker unit.

The number of speaker units is obtained by dividing the surface area of the room in m² by that of the single speaker unit at the listening point (**D**²).

For simplicity's sake, we may assume that the angle of dispersion of ceiling-mounted speaker units is **90°** (tan $\alpha/2=1$) and that the average listening height for people is **1.6 m**, thus, in a room with a working height of 4 metres a single speaker unit will cover approximately **25/30 m²**.

Figure 2 shows the different coverage that can be obtained using different installation patterns and a larger number of speaker units.

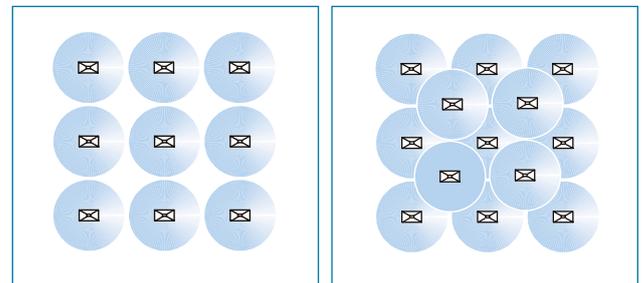


Fig. 2

Generally speaking, it is advisable to avoid installing the speaker units near corners, as this would lead to an intensification of the lower frequencies, an effect that is often detrimental for intelligibility. It is also obvious that the height of the ceiling affects the output power and the number of speaker units to be installed:

High ceiling: + power and – loudspeakers

Low ceiling: – power and + loudspeakers

Wall-mounted speaker units

If the space of the room is such that it is not possible to install ceiling-mounted speaker units, or it is decided to opt for wall-mounted installation, there are a few rules to be complied with in order to achieve optimum quality of the sound. With this type of installation, the listener may be at a greater than critical distance from the speaker unit, with consequent deterioration of the intelligibility and quality of the sound. The size of the room, in particular its length and width, are of fundamental importance. In order to achieve good results, it is advisable to use this type of installation only in areas in which one of the layout dimensions measures **less than 12 metres**, otherwise the sound pressure will not be uniformly distributed, wherever the wall-mounted sources are positioned.

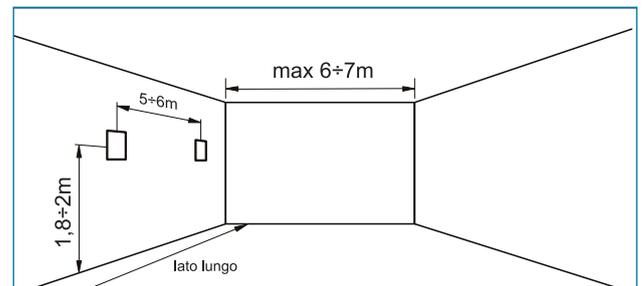


Fig. 3

If the smallest layout dimension of the room is not greater than 6 or 7 metres, good results are obtained by installing the speaker units along one of the longer sides, at a height somewhere **between 1.8 and 2 metres**. For an optimum distribution, the distance between any two adjacent speaker units may vary **between 5 and 6 metri** (fig. 3).

When the shortest side is **between 6 and 12 metres**, it is advisable to install the speaker units along both longer sides, alternating them.

In this case the recommended distance between adjacent speakers can even be doubled (fig. 4).

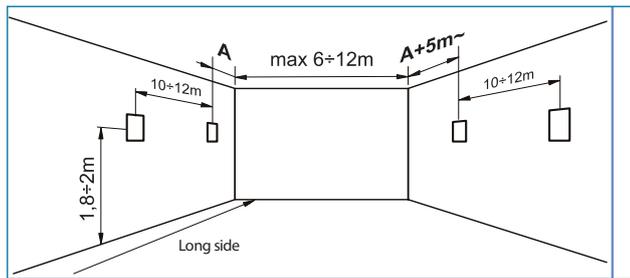


Fig. 4

In even larger rooms it will be necessary to install the loudspeakers in clusters on the load-bearing pillars inside the room. If there are none, it will be absolutely necessary to use sound ceiling or speakers hanging from the ceiling.

In the range of speaker units for wall mounting, special attention should be paid to sound columns, which feature a very narrow vertical dispersion, ideal for rooms with very high ceilings (domes) with a lot of reverberation (churches, large workshops, etc.). For optimum distribution of the units, apply the following rules: installation at a height of about **1.5 metres** above floor level if the listeners are seated, or **1.70 metres** if they are standing, possibly tilting the sound columns by a few degrees in the direction of the audience.

Sound-broadcasting along corridors and pathways

Generally speaking, sound-broadcasting in this type of environment is achieved by means of loudspeakers (sound projectors or horns) installed at regular distances from one another and turned in the same direction, whether in corridors or along outdoor paths (fig. 5).

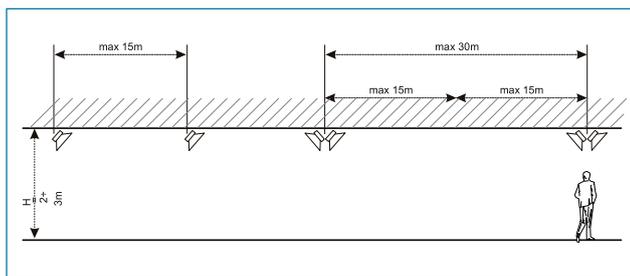


Fig. 5

They must be connected to one another observing their phases and positioned at a **maximum distance of 15 metres from one another** otherwise, in addition to the sound coming from the speaker unit closest to them, listeners moving along the line formed by the speakers will also hear the sound coming from the previous loudspeaker, with a delay in excess of 50 m/sec. This delay will cause deterioration of the intelligibility of the message being broadcast.

An alternative to the above would be the use of two-way speakers installed “flag-style” along the corridor, either on the wall or on the ceiling. Each of these incorporates two loudspeakers facing opposite ways, with their cones facing outwards in both walking directions. These loudspeakers are connected to one another in phase opposition: as the membrane of one of them moves forwards, the other will

go backwards, and vice versa; this provides the sensation that there is a single membrane radiating in both directions, on a horizontal angle of 360°, contributing to a significant improvement in intelligibility. Two-way speakers must be connected in phase to each other, so as to ensure that there are always pairs of loudspeakers that move in a harmonious and synchronised way, and must be installed **no farther than 30 metres** away from each other to avoid, as previously mentioned, the occurrence of reverberations or echoes. As an alternative to two-way speakers, there is nothing to prevent users from installing pairs of horn loudspeakers or other types, positioned opposite each other on the same support and placed at the usual maximum distance of 30 metres from one another. It should be remembered, in any case, that the best results are achieved using loudspeakers close to one another and featuring a lower output power. This applies above all to indoor applications.

SOUND PRESSURE LEVEL (SPL) MEASUREMENT

One of the most important issues to be tackled when dealing with sound as a physical phenomenon is the calculation of its intensity.

SOURCE	dB (SPL)
Rocket taking off	180
Gunshot (1m)	140
Formula 1 car	140
Pain threshold	130
Airplane taking off (50m)	125
Siren	120
Chainsaw (1m)	110
Nightclub, rock concert	100
Scream, whistle	90
Passing lorry (1m)	80
Vacuum cleaner (1m)	70
Radio at high volume	70
Noisy office, radio, conversation	60
Home environment, theatre (10m)	50
Neighbourhood (night)	40
Whispers (1m)	30
Human breath	20
Threshold of hearing	0

People often talk in a vague and imprecise way about the “volume” being higher or lower, or sounds being “louder” or “quieter”; whilst this may be correct at an intuitive level, in practice it is necessary to use a precise measure on which to base the design of an audio system. **Logarithms** are an indispensable tool in the calculation of sound levels. The basic unit of measurement is the **decibel (dB)**, which is calculated using logarithms.

The measurement of acoustic pressure in the open air is always expressed in **dB SPL**, i.e. decibels calculated as a **sound pressure level (SPL)**.

In order to ensure good intelligibility of speech, the average sound pressure level of the message must exceed the existing ambient noise level by at least 6 to 10 dB. In order to design the acoustics properly, therefore, it is essential to know the noise level in the area in which sound is to be broadcast. The table shown here provides the approximate average levels found in normal areas, both indoors and out of doors. These numbers should be considered to be illustrative, as the situations used as examples cannot be precise.

The sensitivity (or efficiency) of a loudspeaker is the sound pressure that the speaker unit produces at a distance of one metre when it absorbs a power equal to 1 Watt.

The sound level produced by a speaker unit lowers as the distance from the listening point increases. Theoretically, if the absorption effect due to the environment is ignored, it can be stated that the effect of doubling the distance will contribute to attenuating the sound pressure level by -6 dB (fig. 6).

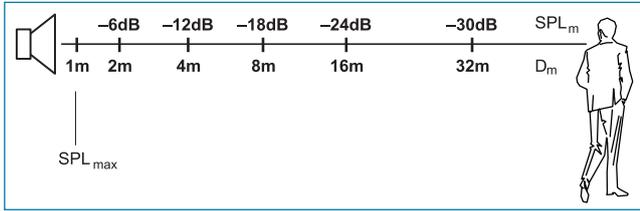


Fig. 6

In any case, the sound pressure of a loudspeaker SPL_m at a given distance D_m is given by the following formula:

$$SPL_m = SPL_{max} - 20 \log (D_m)$$

where SPL_{max} is the sound pressure at a distance of 1 metre.

Another essential parameter of sound pressure is the power absorbed by the speaker unit. Again in this case, there is a proportional relationship that can be summarised as follows: **each time the electrical power of the emitter doubles, the sound pressure increases by 3 dB (likewise, each time the sound pressure is halved, the sound pressure decreases by 3 dB).** The exact formula for calculating the sound pressure SPL_{max} of a speaker unit with a power P applied to it is as follows:

$$SPL_{max} = S + 10 \log (P)$$

where S is the sensitivity (efficiency) of the speaker unit.

To conclude, it can be said that the efficiency of a speaker unit is the most important parameter for sizing an audio system. The greater the efficiency, the less power has to be applied in order to achieve the same sound pressure, this being the aspect to be considered for achieving the required intelligibility.

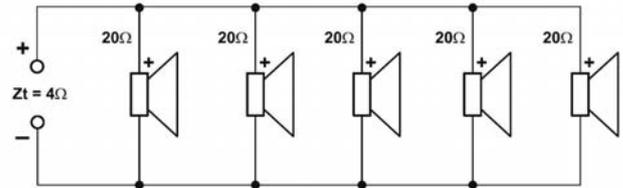
CONNECTION OF THE SPEAKER UNITS

Constant-impedance system

This type of connection is normally used for systems based on a limited number of speaker units or for hi-fi systems, with distribution lines not longer than a few dozen metres. With this type of connection, in order for the amplifiers to drive the speaker units at their rated output power, the total power must be equal to the output power of the actual amplifier. Amplifiers normally have three standard output impedances, i.e. 4, 8 and 16 Ω and these values are marked on the output terminals. It is therefore necessary that the technician be able to determine – sometimes by means of complex calculations – the total impedance of a number of units, regardless of how they are connected (parallel, serial or mixed serial and parallel connections). For the connection of speakers of equal impedance in parallel, the total impedance Z_t is given by:

$$Z_t = Z_{diff} / N_{diff}$$

Where Z_{diff} is the impedance of the individual speaker and N_{diff} is the total number of speakers connected in parallel.

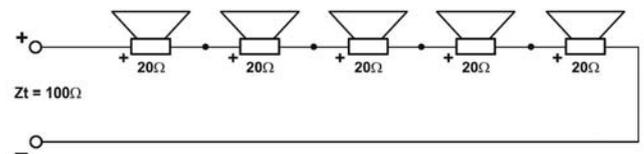


If we have to calculate the total impedance Z_t of n speakers with different impedance and all connected in parallel, we need only apply the following formula:

$$Z_t = 1 / (1/Z_1 + 1/Z_2 + 1/Z_3 + \dots + 1/Z_n)$$

In the connection of n speakers in series, whatever their impedance, the total Z_t is given by the sum of the individual impedances of all the speakers:

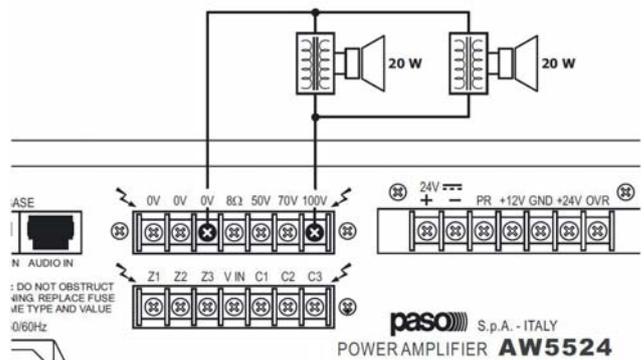
$$Z_t = Z_1 + Z_2 + Z_3 + \dots + Z_n$$



In a mixed series/parallel connection, the total impedance is obtained by combining the above formulae, bearing in mind that the series calculations must be carried out on the different branches and then the parallel of the various resulting impedances.

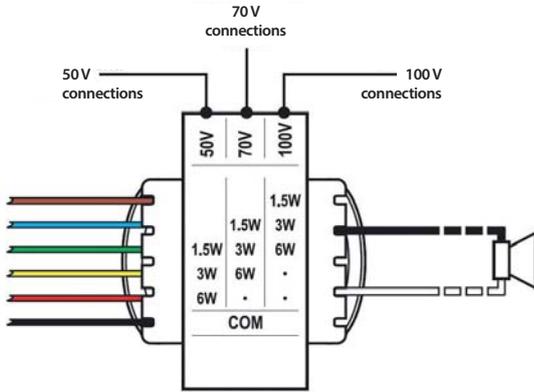
Constant-voltage system

The advantages introduced by systems featuring constant-voltage connections are so many that it is the ideal system for sound-broadcasting systems of any size. This connecting system requires each speaker unit to have its own line transformer, which adapts the impedance of the loudspeaker (which is usually low: 4, 8 or 16 Ω) to the far higher impedance of the actual line. Unlike constant-impedance connection systems, in which it is the loudspeaker that is the load for the amplifier, in a constant-voltage system it is the transformer (connected to the loudspeaker), with its high impedance, that constitutes an almost constant load for the booster.



Each amplifier has its own transformer featuring constant-voltage outputs, which have now become standardised at 50, 70 and 100 V (high impedance). **All the loudspeakers are connected in parallel to the output of the booster.**

Thus, should expansion of the system become necessary (and provided an amplifier with a higher than strictly necessary output power was chosen at the time of the original installation), this will be extremely simple to accomplish, branching out from any of the speaker units installed beforehand. In the same way, and therefore without any side effects for the amplifier, you can eliminate any loudspeakers that are no longer in use by simply disconnecting them.



Typical transformer for constant voltage lines

It is also very useful to have the option of attributing to each individual loudspeaker the value of the maximum power actually used and required in the room where the speaker is installed. This can be done during the installation phase by connecting it to one of the many power sockets, which are always available at the line transformer output, which each speaker is equipped with.

Speakers equipped with a transformer actually allow the user to vary the acoustic pressure generated by directly altering the power transmitted to the speaker (by acting on the transformer) up to a maximum level which coincides with their reaching their rated power.

As for the constant-impedance system, it is necessary to respect the *phase* of both the connection of the individual speaker to its transformer and the connection in parallel of the speaker, complete with transformer, to the distribution line. This prevents the cancellation of the sound pressures generated by nearby loudspeakers, especially at mid/high frequencies. In a constant-voltage system, the calculation of any involved power applied to each P_{dif} speaker can be done simply by applying the formula:

$$P_{dif} = V_2 / Z_{dif}$$

where V is the line voltage (normally 100 V) and Z_{dif} is the primary impedance of the transformer connected to the speaker. The power applied to the speaker is inversely proportional to the impedance value (if the impedance decreases, the absorbed power increases proportionally).

The minimum output impedance Z_{amp} tolerated by an amplifier with constant-voltage outputs can also be easily obtained in the same way:

$$Z_{amp} = V^2 / P_{amp}$$

where V is the line voltage (normally 100V) and P_{amp} is the rated power of the amplifier.

In order to facilitate the user's task, the rating plate on the transformer of the speakers always shows the power information for the many sockets available.

At this point, having defined both the amplifier and the type of speaker, the maximum number of speakers N_{dif} that can be connected to the amplifier is determined by the following formula:

$$N_{dif} = P_{amp} / P_{dif}$$

where P_{amp} is the power of the amplifier and P_{dif} is the power of the individual speaker.

More generally speaking, where the speakers are of different types and/or connected to a different power, it is always important to check that the total power required by the speakers (simply obtained from the sum of the individual powers) is lower than the rated power of the amplifier.

It will therefore be sufficient to add up the powers used on each transformer of the loudspeakers in order to obtain the figure for the rated power of the amplifier to be used to drive the sound distribution line.

By analogy, one could think of the constant-voltage distribution network like a power line that supplies several bulbs connected in parallel (the loudspeakers), which may have different powers from one another, but whose total power may not exceed that of the electricity meter (in our case, the rated power of the amplifier).

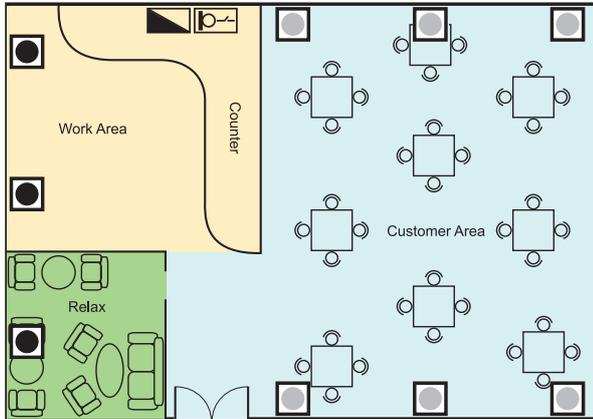
Finally, a further advantage of constant-voltage connections is that, with the same transmitted power, they have lower currents than those circulating on the conductors of a constant-impedance system, which usually works with voltages of the order of magnitude of a few dozen Volts. This translates into the advantage of being able to use connection cables for the loudspeaker lines with much slimmer conductors.

The following pages demonstrate a series of application examples for the installation of our products in the most common types of public spaces:

- Page 91 Bars and shops, supermarkets
- Page 92 Shopping centres
- Page 93 Small businesses, garages, car dealerships
- Page 94 Restaurants

BARS, SHOPS

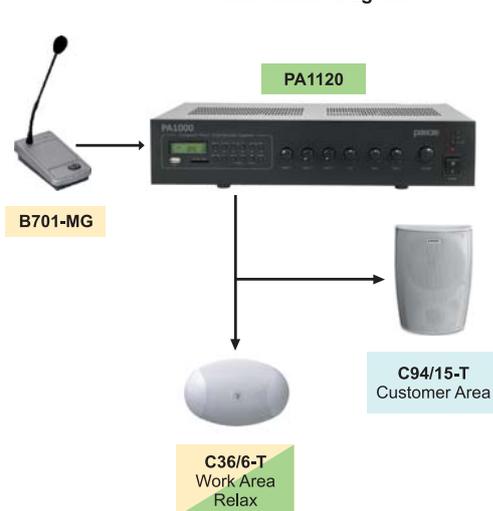
- Announcement
- All-call from microphone
- Playing out of background music
- Suitable for rooms with or without false-ceilings
- From total 200 to 300 sq. Meters



Products used

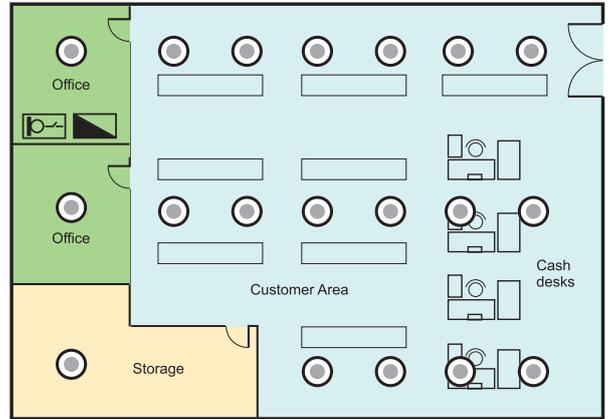
- 1 pc. **B701-MG**
Microphone station
- 6 pcs. **C94/15-T**
15W two-way speaker unit
- 3 pcs. **C36/6-T**
6W «Candy» wall/ceiling-mounted speaker unit
- 1 pc. **PA1120**
Tuner/120W amplified USB/SD card player

Connection diagram



SUPERMARKETS

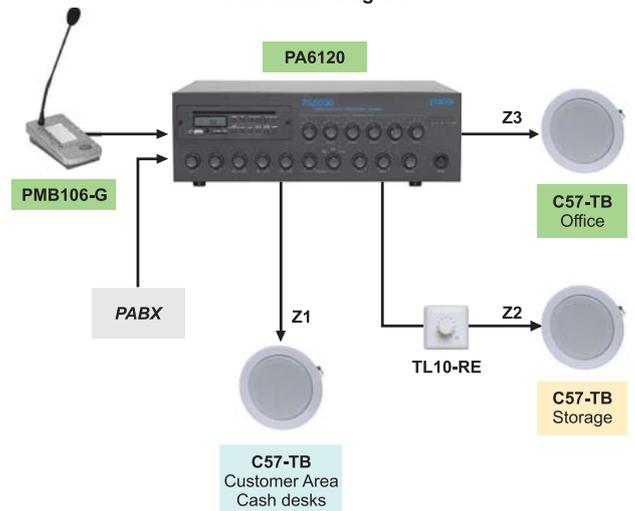
- Announcement
- All-call from microphone
- Calls from PABX
- Playing out of background music
- Suitable for rooms with false-ceilings
- From total 700 to 900 sq. Meters



Products used

- 1 pc. **PMB106-G**
Microphone station
- 19 pcs. **C57-TB**
6W ceiling speaker
- 1 pc. **TL10-RE**
10W volume controller
- 1 pc. **PA6120**
120W compact system

Connection diagram

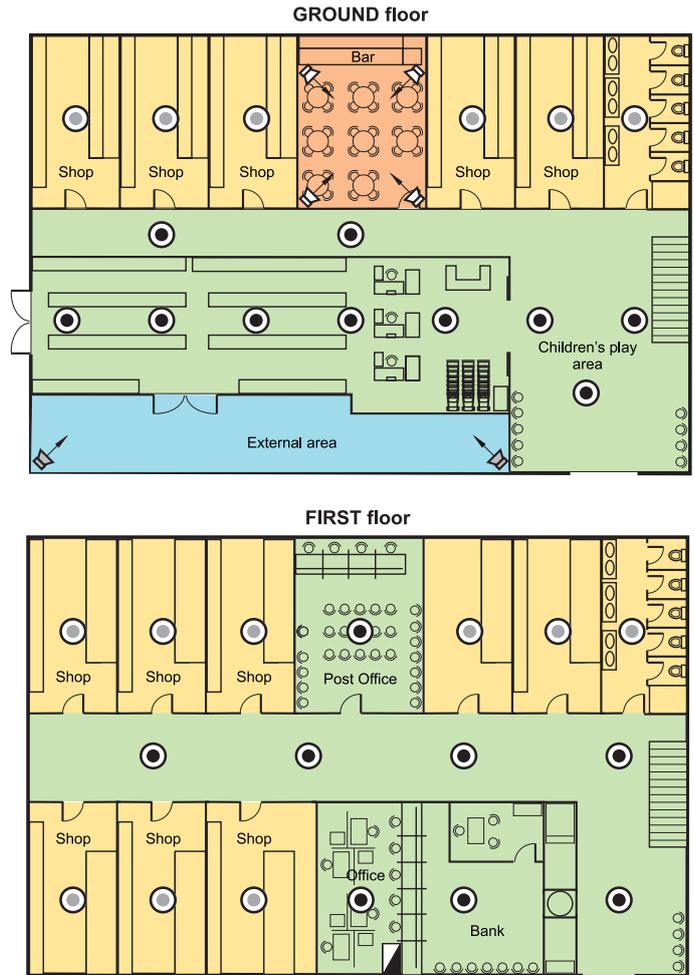


SHOPPING CENTRES

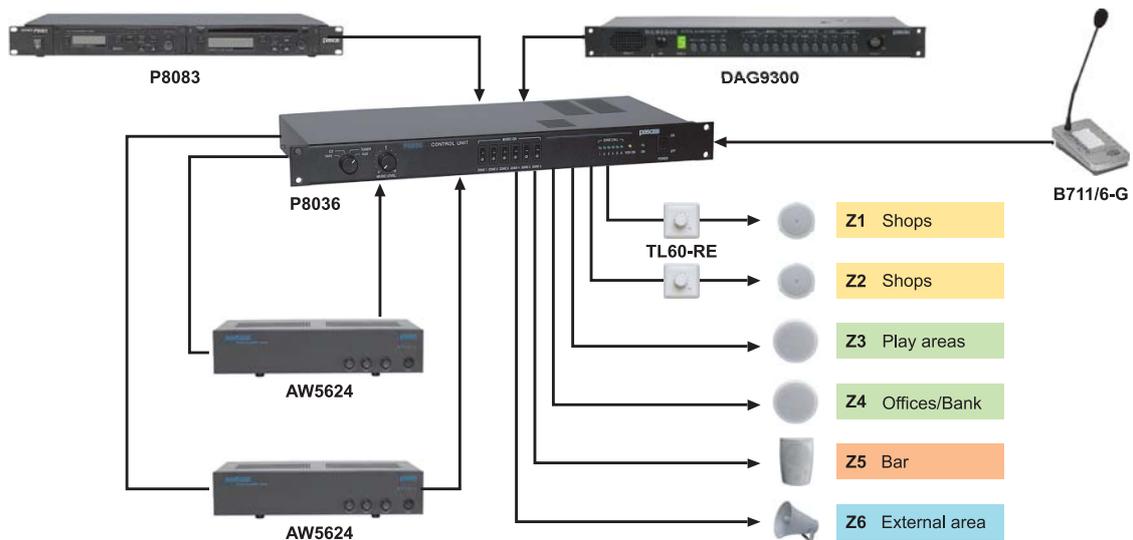
- Announcement, All-calls from microphone
- Selective zone calls
- Playing out of background music
- Suitable for rooms with or without false-ceilings
- Automatic message generator
- 2 floors (about 1.200 sq. Meters each)

Products used

- 1 pc. **B711/6-G**
Pre-amplified microphone station with zone selection
- 15 pcs. **C52/6-T**
6W ceiling speaker unit
- 18 pcs. **C53/10-T**
10W ceiling speaker unit
- 4 pcs. **C94/15-T**
15W two-way speaker unit
- 2 pcs. **TR30-TW**
30W horn-speaker unit
- 1 pc. **TL60-RE**
60W volume controller
- Main unit composed by:**
 - 1 pc. **P8083**
Tuner&CD/mp3 player
 - 1 pc. **P8036**
6-zone voice/music control unit
 - 1 pc. **DAG9300**
Message generator
 - 1 pc. **AW5624**
240W booster (VOICE)
 - 1 pc. **AW5624**
240W booster (MUSIC)



Connection diagram

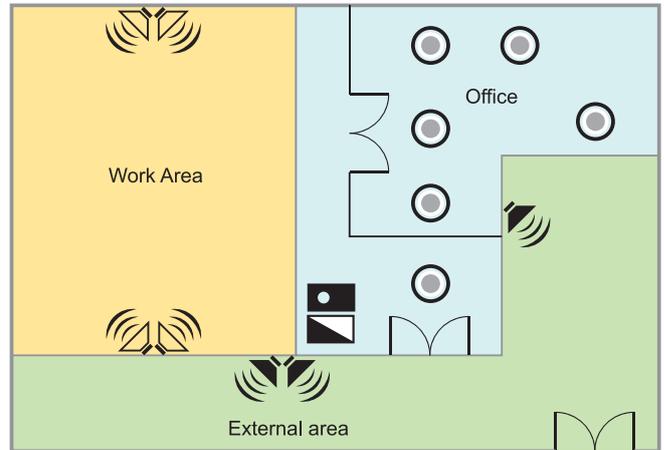


SMALL BUSINESSES, GARAGES, CAR DEALERSHIPS

- Announcement
- Service all-call
- Playing out of background music
- Suitable for rooms with false-ceilings
- From total 1.000 to 1.500 sq. Meters

Products used

-  1 pc. **B701-MG**
Microphone station
-  6 pcs. **C58/6-TB**
10W ceiling speaker unit
-  3 pc. **TR30-TW**
30W aluminium horn-speaker, connected at 10W
-  4 pc. **C55**
20W sound projector, connected at 10W
-  1 pc. **PA1120**
Tuner/120W amplified USB/SD card player



Connection diagram



RESTAURANTS

- Announcement
- All-call from microphone
- Wireless microphone for entertainment
- Playing out of background music
- Suitable for rooms with false-ceilings
- From total 800 to 1.000 sq. Meters

Products used

 1 pc. **B711-G**
Pre-amplified microphone station

 21 pcs. **C53/10-T**
10W ceiling speaker unit

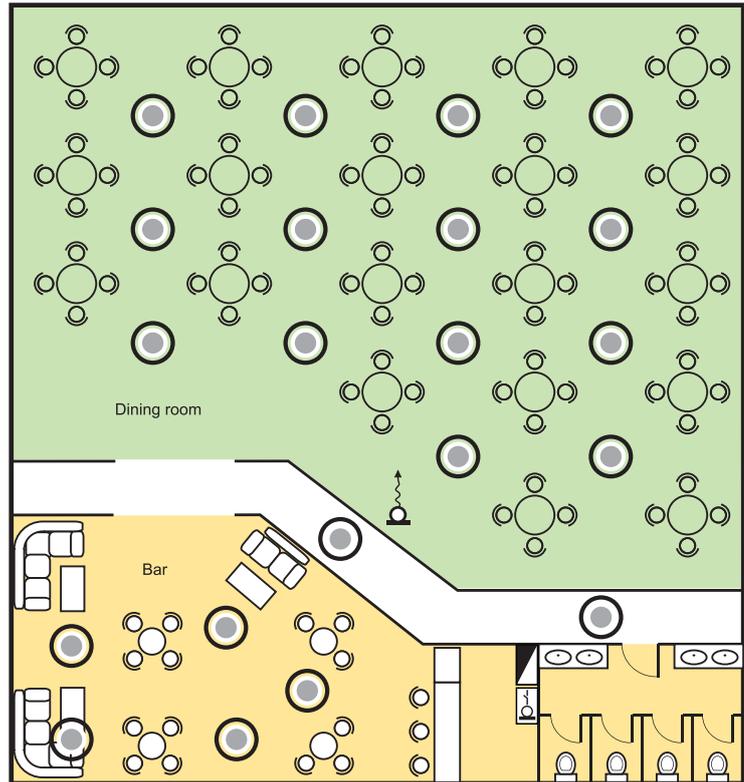
 1 pc. **MA855/R850A**
UHF wireless microphone

 Amplification unit composed by:

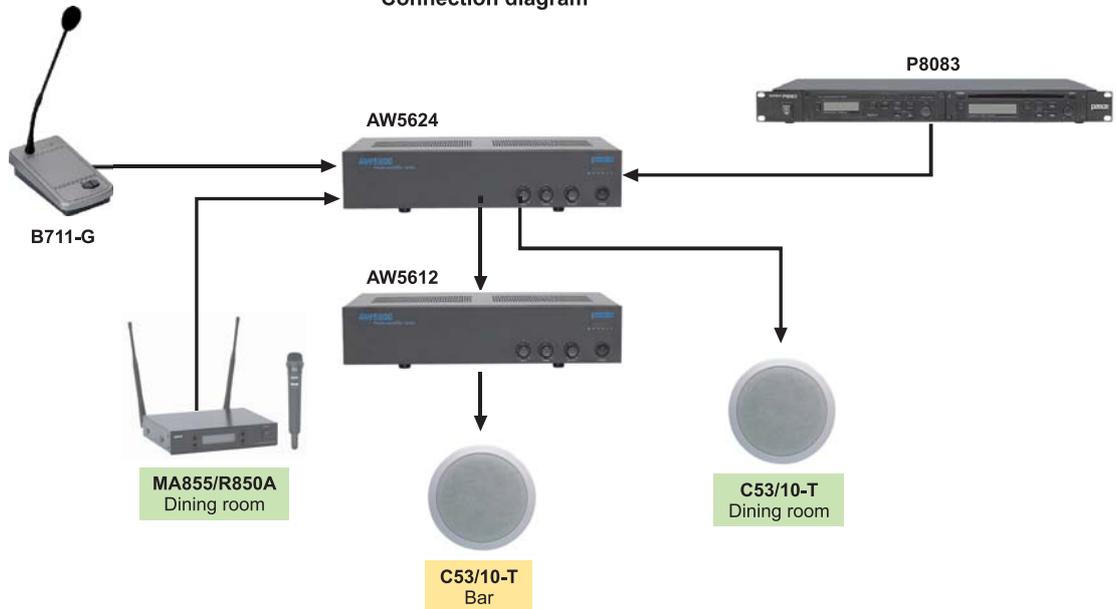
1 pc. **P8083**
Tuner&CD/mp3 player

1 pc. **AW5624**
240W booster

1 pc. **AW5612**
120W booster



Connection diagram



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