



# ENlarge your safety



**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.



*Agli interessati all'arte radiofonica  
nessa utile il nostro sforzo  
volonteroso e costante nel  
raggiungimento di un sempre  
più alto livello di perfezione -*  
*GELOSO*





## ...an important reality.

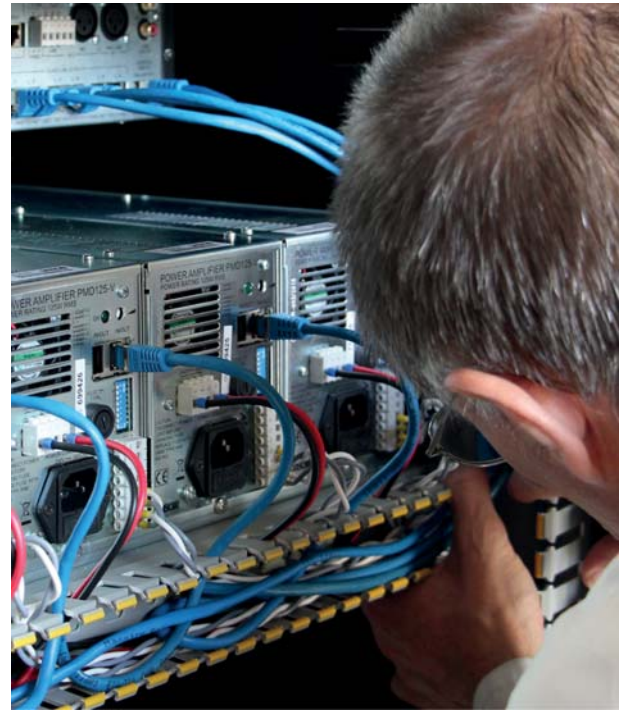
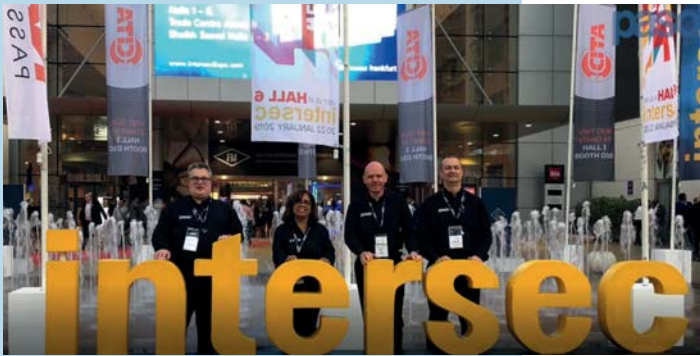
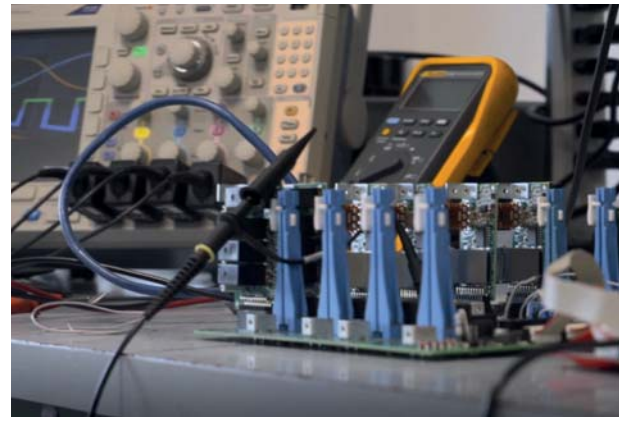
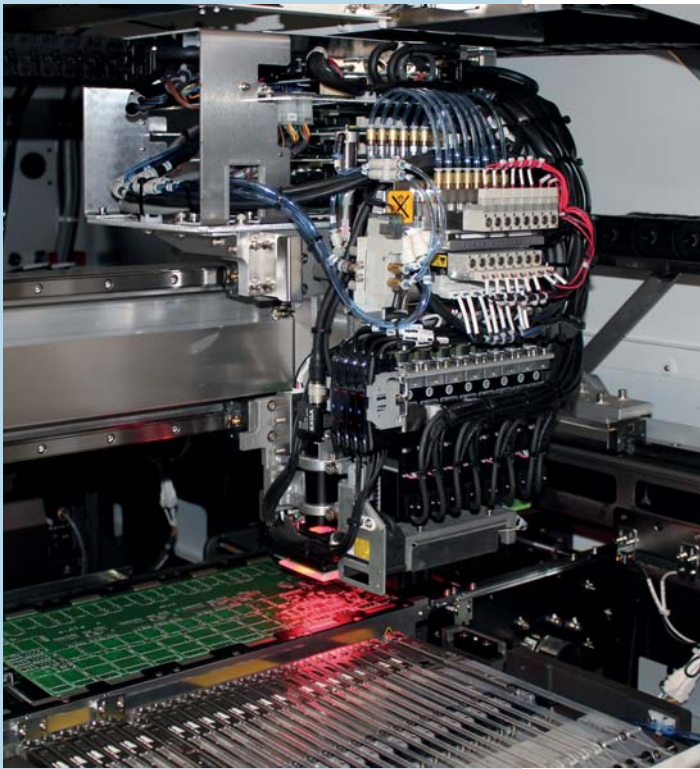
PASO S.p.A is now a leading company on the sound-broadcasting, congress and voice evacuation system markets and is highly appreciated both in Italy and abroad.

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.

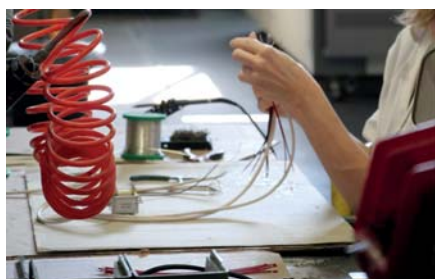
In the current global marketplace context, PASO S.p.A. claims with well-justified pride its identity as an Italian manufacturing company that designs, develops, makes and markets its own products. Thanks to the commitment and professional skills of its personnel, the company has always remained in step 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.











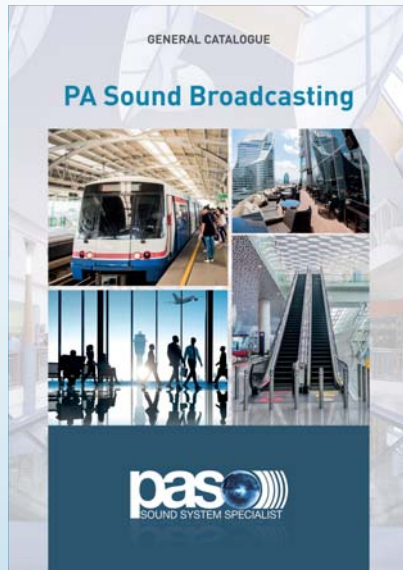
**PASO is...**

- ✓ Knowledge
- ✓ Professionalism
- ✓ Reliability





## Our catalogues

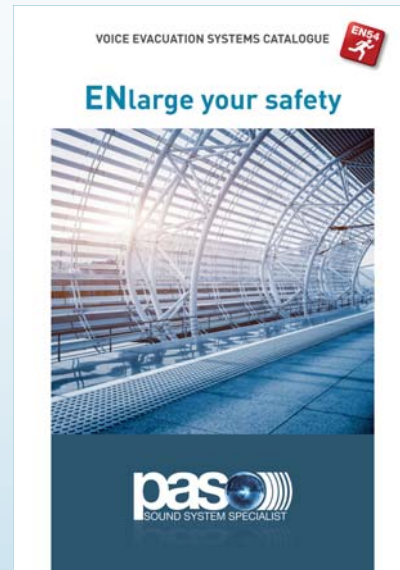


### GENERAL CATALOGUE PA Sound broadcasting

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!



# ENlarge your safety

On premises where large numbers of people are present, such as hospitals, schools, shopping malls and office buildings, it is essential to provide a suitable sound-broadcasting system that, following activation by the firefighting control unit, will handle the **emergency situation** and enable guided and controlled evacuation of the building.

**Current standards** define in detail the features of an electro-acoustic system for evacuation and emergency purposes in terms of design and installation so that it will meet the applicable safety and reliability requisites.

**PASO** Voice Evacuation Systems are the current answer to the needs specified in standards.

*Design it with us!*



- ✓ Flexible architecture
- ✓ Simple to install
- ✓ Easy to use







## SUMMARY

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PASO, leader brand of “Made in Italy” products is presenting the **PAW** range, that has been designed and engineered to offer the most innovating solutions in the realization of alarms systems, in order to manage emergency situations and to allow a guided evacuation, according to actual regulations (**EN54-16**, **EN54-4**, **ISO 7240-19** and **EN 50849**).

The **PAW** all-in-one compact systems are equipped with a **EN54-16** & **EN54-4** certified control unit and they are all specifically designed for ease of installation and for operating in a vast range of applications.

These systems are able to manage, depending on the model, from 2 up to 6 alarm zones via local controls, remote microphone stations and controlled inputs connected to a Fireman’s unit.



*This application example demonstrates the use of 6 intercommunicating PAW systems in the installation of a complex made up of several buildings.*





NEW



NEW

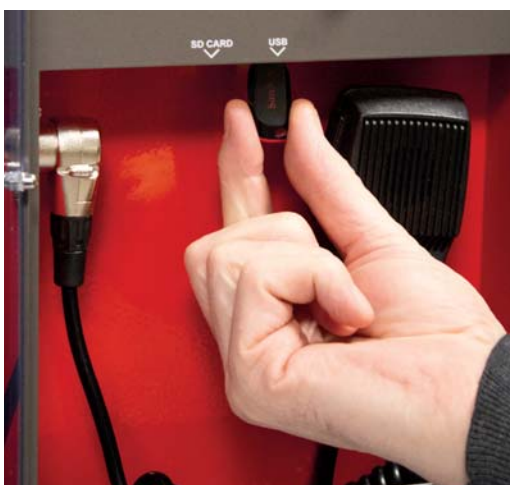
**PAW51K-VES range**

Two models available

**PAW51K4-V** 1000W / 4 zones | double line (A+B)**PAW51K6-V** 1000W / 6 zones | double line (A+B)**PAW5500-VES range | Three models available****PAW5502-V** 500W / 2 zones | double line (A+B)**PAW5504-V** 500W / 4 zones | double line (A+B)**PAW5506-V** 500W / 6 zones | double line (A+B)

The **PAW51K-VES** (1000W) and **PAW5500-VES** (500W) ranges, the latest additions to the family of PAW all-in-one compact systems, provide the user with a great many new features and technological improvements.

These two new PAW ranges offer a 4.3" backlit touchscreen display that allows the user to select the alert and evacuation zones, as well as having "service" menus with options to adjust volume levels, configure the device and view any faults.



The devices are equipped with a handheld fireman's monitored microphone, located on the front panel. All the models are available with a double loudspeaker line output (A+B) and the option of broadcasting both pre-recorded evacuation and alarm messages, and pre-recorded broadcast messages, such as adverts, various kinds of announcements and audio warnings.

Other new features that these products bring to the PAW series include the **integrated SD/USB player**, which allows you to play background music in mp3 format from an SD card or any external device connected via USB; the handy new multilingual management menu; the **dual LINK line for connection to other PAW units**, as well as the **independent three-band music equaliser** for each zone and the very interesting option of inserting **additional cards** in order to add two or six music channels.

**Typical installations:****2 zones** offices, meeting/conference halls**4 zones** cinemas, theatres, supermarkets**6 zones** hospitals, shopping malls, hotels**EN 54-4:1997 + EN 54-16:2008 certification:**

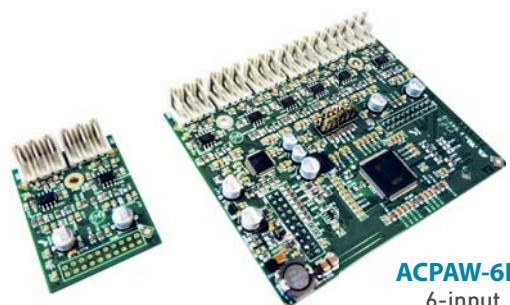
PAW5500-VES range n. 0068/CPR/101-2018

PAW51K-VES range n. 0068/CPR/063-2019



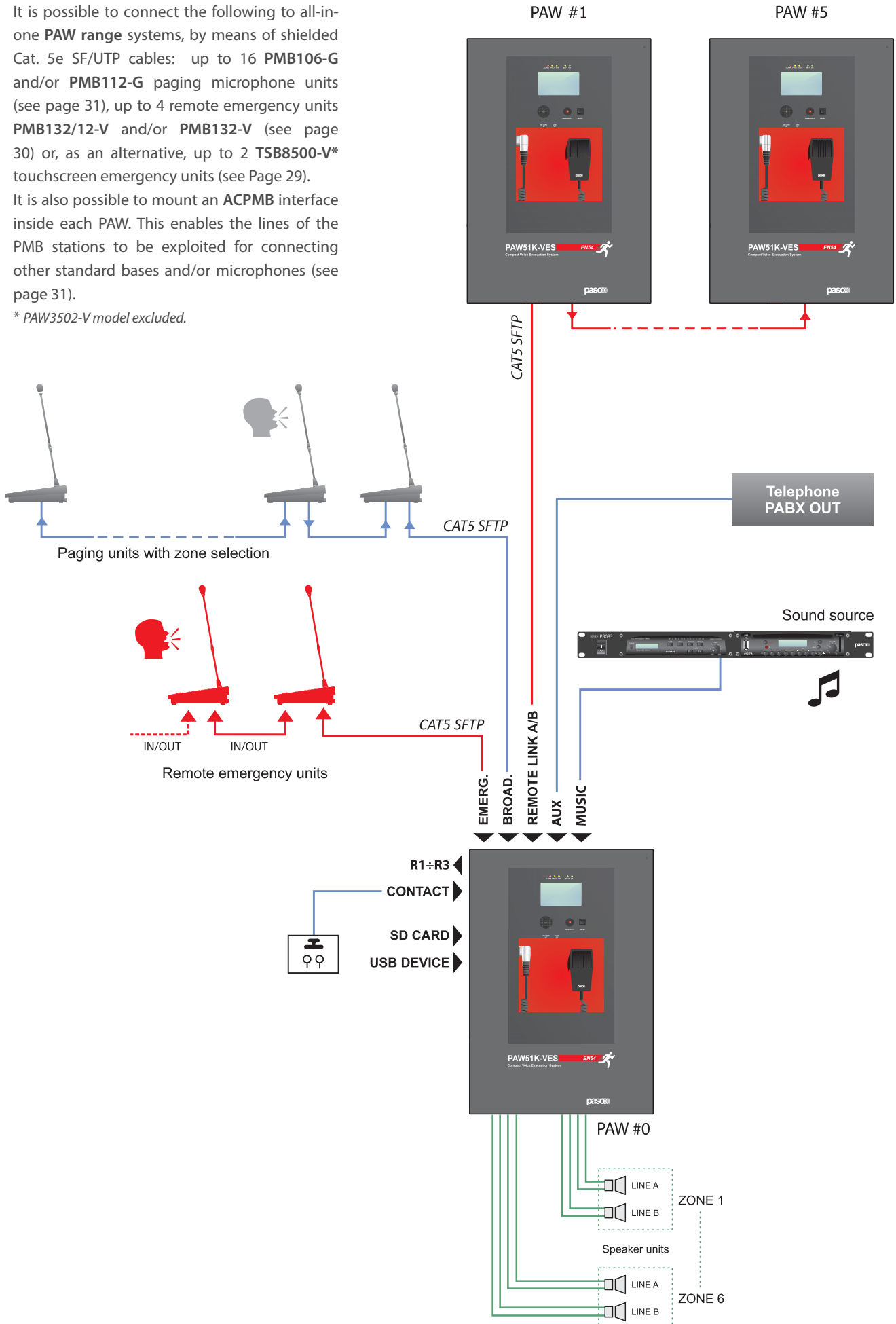
## FUNCTIONAL FEATURES

- Audio rated power: 1000 W (**PAW51K-VES**) or 500 W (**PAW5500-VES**) freely distributed between the zones up to a maximum of 250 W (for each zone).
- 4.3" touch screen back-lighted display for Alert & Evacuation zone selection, levels adjustment, settings and failure visualization.
- Fireman's monitored microphone on the front panel (included).
- Sending of EVACUATION and ALERT pre-recorded messages.
- Sending of BROADCAST pre-recorded messages.
- Playing back of pre-recorded messages via monitor loudspeaker.
- 7 off controlled contact inputs, configurable for active playing the evacuation and/or alert messages to the programmed zones or for reset.
- 1 off music input for sound sources.
- 1 off auxiliary input configurable as a music source, a call with precedence activation or a call with automatic activation (VOX).
- 3 off configurable relay outputs.
- Double A+B output for each zone.
- Event log (list of failures and/or alarms that have occurred in the system).
- Double LINK line for connecting other **PAW51K-VES** and/or **PAW5500-VES** units (up to a total of 6 units).
- Multilanguages management.
- Protected local button for placing the system in an emergency state, equipped with its own LED.
- Local reset button.
- 3-band equalisation for each zone output.
- 3-band equalisation for each music input.
- Optional internal expansion card **ACPAW-2IN** for two additional music inputs (EXT 1 and EXT 2).
- Optional internal expansion card **ACPAW-6IN** with DSP for six additional music inputs.
- Built-in SD/USB input for background music MP3 player.
- Independent selection on each zone of the various audio sources (MUSIC IN, AUX IN, MP3 player and EXT).
- Up to 8 pre-recorded messages can be retrieved from outside through input contacts (of which 2 fixed emergency messages - plus 6 that can be classed as emergency / evacuation / broadcast messages).
- Possibility of setting up to 16 timers for the programmed playing out of the broadcast messages with the possible activation of signalling relays.
- Up to 16 **PMB106-G** and/or **PMB112-G** broadcasting microphone stations can be connected.
- Up to 4 of the above mentioned stations can be set for local calls only (zones of the card-cage to which they are connected).
- Up to 4 **PMB132-V** and **PMB132/12-V** remote emergency units can be connected (or, as an alternative, up to 2 touch screen units **TSB8500-V**).
- **EN54-4** certified battery charge unit for 24Vdc secondary power supply (batteries not included).
- Mounting on 19" rack (optional, with **ACPAW-RCK** accessory kit).

**ACPAW-RCK**Support kit  
for rack mounting**ACPAW-2IN**  
2-input  
expansion**ACPAW-6IN**  
6-input  
expansion

It is possible to connect the following to all-in-one **PAW range** systems, by means of shielded Cat. 5e SF/UTP cables: up to 16 **PMB106-G** and/or **PMB112-G** paging microphone units (see page 31), up to 4 remote emergency units **PMB132/12-V** and/or **PMB132-V** (see page 30) or, as an alternative, up to 2 **TSB8500-V\*** touchscreen emergency units (see Page 29). It is also possible to mount an **ACPMB** interface inside each PAW. This enables the lines of the PMB stations to be exploited for connecting other standard bases and/or microphones (see page 31).

\* PAW3502-V model excluded.





## PAW51K-VES, PAW5500-VES | COMPACT SYSTEMS 2, 4, 6 ZONES

MODEL	PAW5502-V	PAW5504-V	PAW5506-V	PAW51K4-V	PAW51K6-V
Rated audio output @230Vac	500 W / D=2,5%		1000 W / D=2,5%		
Rated audio output @24Vdc	400 W / D=10%*		800 W / D=10%*		
Display	4.3" backlit with touch screen 480x272 pixels				
No. of PAW per system	Max 6 (ID 0÷5)				
No. of zones/amplifiers	2	4	6	4	6
Inputs					
Emergency microphone • Sensitivity / Impedance • Frequency response   S/N ratio	Balanced XLR-F on the front door Signal level 20 mV / 10 kΩ 60 ÷ 20.000 Hz   72 dB				
Paging units (BROAD.) • Sensitivity / Impedance • Frequency response   S/N ratio	1 off Rj45 for PMB106-G / PMB112-G paging units (PA) Signal level max. 1400 mV / 85 kΩ 60 ÷ 20.000 Hz   83 dB				
Emergency units (EMERG.) • Sensitivity / Impedance • Frequency response   S/N ratio	1 off Rj45 for PMB132-V, PMB132/12-V or TSB8500-V emergency microphone units Signal level max. 1400 mV / 85 kΩ 60 ÷ 20.000 Hz   83 dB				
AUX (LINE-VOX) • Sensitivity / Impedance • Frequency response   S/N ratio	Balanced with terminals (HOT-COM-GND) - Programmable in ON / OFF / VOX with A.P.T. modes Precedence input with contact closing activation 134 mV / 31 kΩ 90 ÷ 20.000 Hz   81 dB / 85 dBA				
MUSIC / EXT • Sensitivity / Impedance • Frequency response   S/N ratio	Balanced with terminals (HOT-COM-GND) 134 mV / 31 kΩ 90 ÷ 20.000 Hz   81 dB / 85 dBA				
Equalisation					
Independent equalisation for each output zone	3-band equaliser Bass tones (100 Hz): ± 10 dB Mid-range (1 kHz): ± 10 dB Treble tones (10 kHz): ± 10 dB				
Independent equalisation for each music input					
Outputs					
Constant voltage outputs w/double line (A/B) <i>One zone output can be configured as a standby for the others.</i>	2 zones for 100V lines Minimum 40 Ω	4 zones for 100V lines Minimum 40 Ω	6 zones for 100V lines Minimum 40 Ω	4 zones for 100V lines Minimum 40 Ω	6 zones for 100V lines Minimum 40 Ω
REMOTE LINK A/B • Output level / Impedance • Sensitivity / Input impedance	n°2+2 Rj45 for connection with another PAW51K-VES and/or PAW5500-VES unit 1 V / 400 Ω 3600 mV / 3 kΩ				
Emergency controls • Controlled inputs CONTACT • Outputs R1, R2, R3	Programmable for <i>normally active</i> or <i>normally inactive</i> state 7 off inputs with diagnostic 3 off relays for signalling, state of emergency and faults, Terminals <i>N.O-N.C-Exchange</i> state				
General information					
Mains power supply @230 Vac Consumption @230 Vac	230Vac 50/60Hz +10/-15%	230Vac 50/60Hz +10/-15%	230Vac 50/60Hz +10/-15%	100 ~ 264 Vac 47/63Hz	100 ~ 264 Vac 47/63Hz
	646 W full load (2amp active)	653 W full load (2amp active/2amp stand-by)	660 W full load (2amp active/4amp stand-by)	1280 W full load (4amp active)	1280 W full load (4amp active / 2amp stand-by)
	36 W no load	43 W no load	Efficiency: 75,6% 50 W no load	100 W no load	100 W no load
Secondary power supply @24 Vdc (26,3 Vdc)	20 A full load	20 A full load	20 A full load	40 A full load	40 A full load
Secondary power supply Consumption @24 Vdc	0,92 A no load / quiescent	1,22 A no load / quiescent	1,5 A no load / quiescent	2 A no load / quiescent	2 A no load / quiescent
	0,3 A no load / energy saving	0,3 A no load / energy saving	0,3 A no load / energy saving	0,3 A no load / energy saving	0,3 A no load / energy saving
Batteries (not included)	Suggested value: 26÷28 Ah			Only use 40 Ah batteries	
Charger / Power supply unit	8 A (I max. a) / 12 A (I max. b) 21 V (final voltage – detached battery) 27,2 V (complete load voltage)			16 A (I max. a) / 20 A (I max. b) 21 V (final voltage – detached battery) 27,2 V (complete load voltage)	
Environmental operating conditions	Temperature: +5°C ÷ +40°C / Relative humidity: 25% to 75% (non-condensing)				
Type of mounting	Wall / To 19" rack with <b>ACPAW-RCK</b> optional accessory				
Dimensions (W x H x D)	430 x 620 x 240 mm				
Weight (without batteries)	19,3 kg			22 kg	

\*typical distortion at 25 W 0,025%

**PAW4500-VES range** | Three models available**PAW4502-V** 500W / 2 zones | double line (A+B)**PAW4504-V** 500W / 4 zones | double line (A+B)**PAW4506-V** 500W / 6 zones | double line (A+B)

Just like their “big brothers” of **PAW51K-VES** and **PAW5500-VES** ranges, **PAW4500-VES** and **PAW3502-V** models are integrated voice evacuation systems for emergency installations and specifically designed for wall-mounting and equipped with a control unit certified for conformity with **EN54-16** and **EN54-4** standards.

- ✓ Audio rated power: 500 W freely distributed between the zones up to a maximum of 250 W (for each zone).
- ✓ 4.3” touch screen back-lighted display for Alert & Evacuation zone selection, levels adjustment, settings and failure visualization.
- ✓ Fireman’s monitored microphone on the front panel (included) for sending emergency live messages.

**EN 54-4:1997 + EN 54-16:2008 certification****PAW4500-VES range** n. 0068/CPR/038-2016**PAW3500-VES range** n. 0068/CPR/038-2016**PAW3500-VES range** | One model available**PAW3502-V** 500W / 2 zones | double line (A+B)

The excellent quality/price ratio of the “Light” **PAW3502-V** model makes it the ideal single solution for small systems such as those used in restaurants, shops or small public premises.

**FUNCTIONAL FEATURES**

Sending of EVACUATION and ALERT pre-recorded messages.

- 7 off monitored control inputs, each of which is configurable to play evacuation and/or alert messages, programmable for each zone, or for the reset of the messages.
- Configurable relay outputs.
- Double output A+B per zone.
- Possibility to connect up to 4 remote emergency microphone units of the **PMB132** range or 2 **TSB8500-V** touch-screen units (PAW4500-VES range only).





## PAW4500-VES, PAW3500-VES | COMPACT SYSTEMS 2, 4, 6 ZONES

MODEL	PAW4502-V	PAW4504-V	PAW4506-V	PAW3502-V
Rated audio output @230Vac	500 W / D=2,5%			
Rated audio output @24Vdc	400 W / D=10%*			
Display	4.3" backlit with touch screen 480x272 pixels			
No. of PAW per system	Max 6			
No. of zones/amplifiers	2	4	6	2
Inputs				
Emergency microphone • Sensitivity / Impedance • Frequency response • S/N ratio	Balanced XLR-F on the front door Signal level 20 mV / 10 kΩ 60 ÷ 20.000 Hz 72 dB			
Paging units (DESK) • Sensitivity / Impedance • Frequency response • S/N ratio	1 off Rj45 for PMB106-G / PMB112-G pagine units (PA) Signal level max. 1400 mV / 85 kΩ 60 ÷ 20.000 Hz 83 dB			
Emergency units (EMG. DESK) • Sensitivity / Impedance • Frequency response • S/N ratio	1 off Rj45 for PMB132-V, PMB132/12-V or TSB8500-V (PAW4500-VES only) Signal level max. 1400 mV / 85 kΩ 60 ÷ 20.000 Hz 83 dB			
AUX (LINE-VOX) • Sensitivity / Impedance • Frequency response • S/N ratio	Balanced with terminals (HOT-COM-GND) Programmable in ON / OFF / VOX with A.P.T. modes Precedence input with contact closing activation 134 mV / 31 kΩ 90 ÷ 20.000 Hz 81 dB / 85 dBA			
MUSIC • Sensitivity / Impedance • Frequency response   S/N ratio	Balanced with terminals (HOT-COM-GND) 134 mV / 31 kΩ 90 ÷ 20.000 Hz   81 dB / 85 dBA			
Ouputs				
Constant voltage outputs w/double line (A/B) <i>One zone output can be configured as a standby for the others.</i>	Load impedance per single zone ≥ 40 Ω Total load impedance of all zones ≥ 20 Ω			
	2 zones for 100V lines	4 zones for 100V lines	6 zones for 100V lines	2 zones for 100V lines
Emergency controls	Programmable for normally active or normally inactive state			
• Controlled inputs CONT. IN • Outputs Rn	7 off inputs with diagnostics 3 off relays for signalling, state of emergency and faults, terminals N.O-N.C-Exchange state		7 off inputs w/diagnostics 1 off relays for signalling, Term. N.O-N.C.-Exchange	
General information				
	230Vac 50/60Hz +10/-15%	230Vac 50/60Hz +10/-15%	230Vac 50/60Hz +10/-15%	230Vac 50/60Hz +10/-15%
Mains power supply @230 Vac Consumption @230 Vac	646 W full load (2amp active)  36 W no load	653 W full load (2amp active/2amp stand-by)  43 W no load	660 W full load (2amp active/4amp stand-by) Efficiency: 75,6% 50 W no load	646 W full load (2amp active)  36 W no load
Secondary power supply @24 Vdc (26,3 Vdc) Secondary power supply Consumption @24 Vdc	20 A full load  0,7 A no load / quiescent 0,2 A no load / energy saving	20 A full load  0,95 A no load / quiescent 0,2 A no load / energy saving	20 A full load  1,2 A no load / quiescent 0,2 A no load / energy saving	20 A full load  0,7 A no load / quiescent 0,2 A no load / energy saving
Batteries (not included)	Suggested value: 26÷28 Ah			
Charger / Power supply unit	8 A (I max. a) 12 A (I max. b) 21 V (final voltage – detached battery) 27,2 V (complete load voltage)			
Environmental operating conditions	Temperature: +5°C ÷ +40°C Relative humidity: 25% to 75% (non-condensing)			
Type of mounting	Wall			
Dimensions (W x H x D)	430 x 620 x 240 mm			
Weight (without batteries)	19,3 kg			

\*typical distortion at 25 W 0,025%

NEW



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

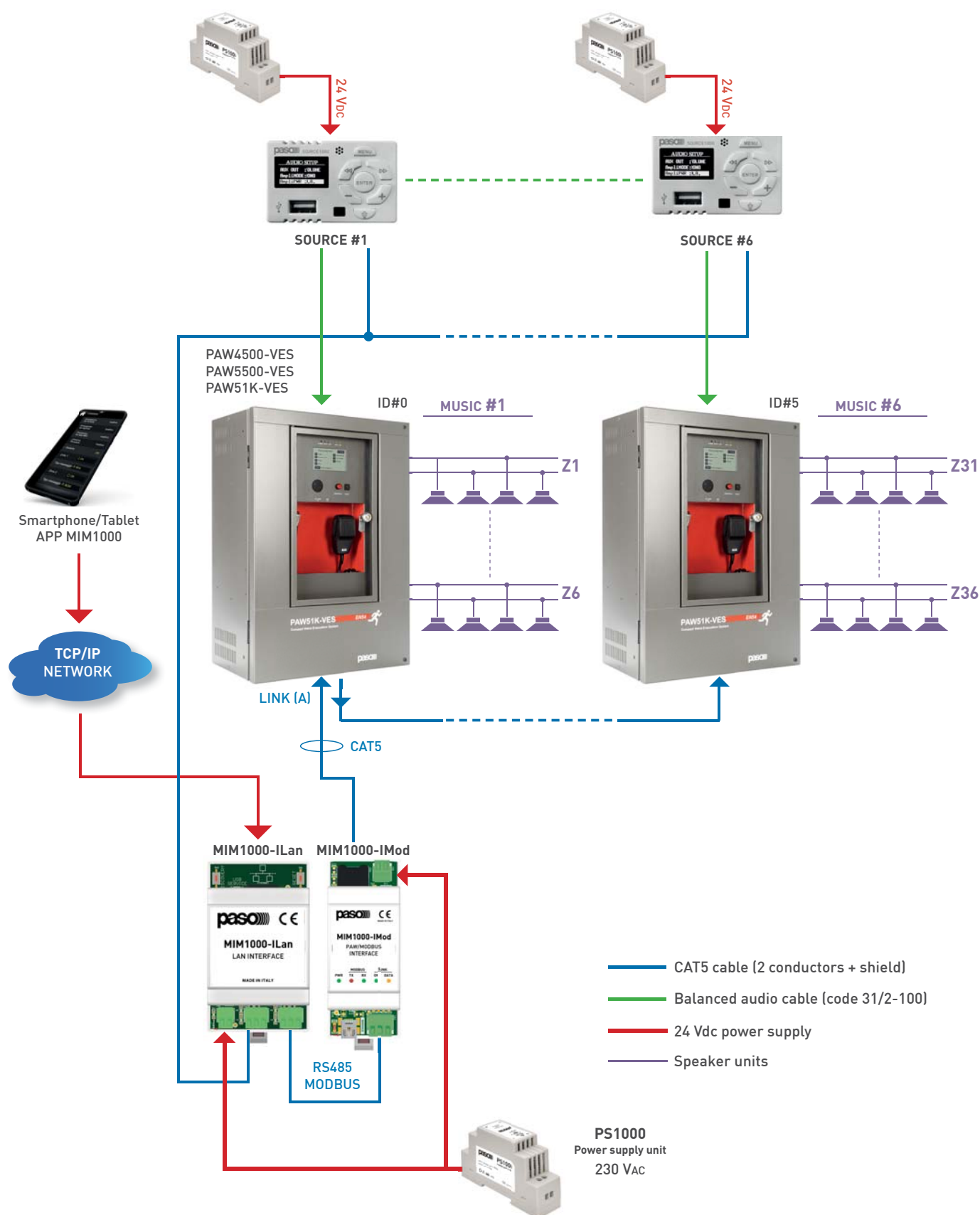
CODE	COLOUR	DOMESTIC RANGE
ACMIM-1B	Charcoal grey	ABB Elos, GEWISS Playbus, VIMAR Idea
ACMIM-1W	White	
ACMIM-2B	Charcoal grey	BTICINO International / Air / Living / Luna / Modo - MASTER
ACMIM-2W	White	
ACMIM-3B	Charcoal grey	AVE Sistema 45
ACMIM-3W	White	
ACMIM-4B	Charcoal grey	VIMAR Plana
ACMIM-4W	White	
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"> <li>• Paso MIM1000 Control APP (iOS/Android/MAC/PC).</li> <li>• Configuration software for PC (WIN/MAC).</li> </ul>	—
Protocols	<ul style="list-style-type: none"> <li>• Paso SOURCE1000.</li> <li>• ModBus (Paso MIM1000-iMOD).</li> </ul>	<ul style="list-style-type: none"> <li>• EVAC (RJ45 LINK).</li> <li>• ModBus RTU (Monitoring).</li> </ul>
Connections	<ul style="list-style-type: none"> <li>• 2x RS485 (1x Bus SOURCE1000 - 1x Bus MIM1000-iMOD).</li> <li>• 1x RJ45 (LAN).</li> <li>• 1x 12-24 VDC power supply.</li> </ul>	<ul style="list-style-type: none"> <li>• 1x RS485 (ModBus RTU).</li> <li>• 1x RJ45 (EVAC LINK).</li> <li>• 1x 12-24 VDC power supply.</li> </ul>
Power supply	<ul style="list-style-type: none"> <li>• 12-24 VDC with PS1000* external power unit (DIN).</li> <li>• Max. Absorbtion: 1,5A@5Vcc.</li> </ul>	<ul style="list-style-type: none"> <li>• 12-24 VDC with PS1000* external power unit (DIN).</li> <li>• * not included</li> </ul>
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 | Type A voice evacuation system

Multistation with a different sound source for each PAW

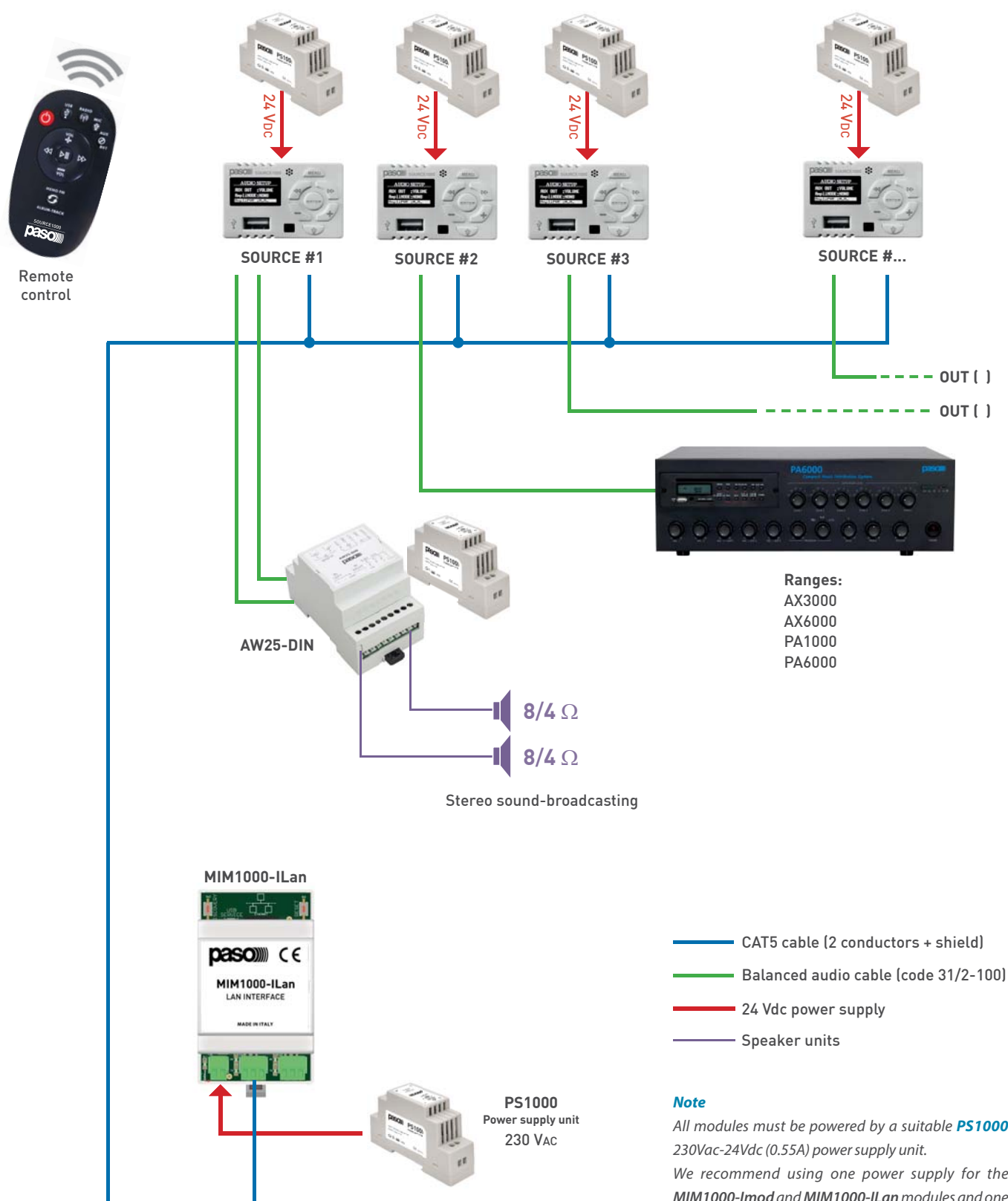




### Single-station with a different sound source for each area



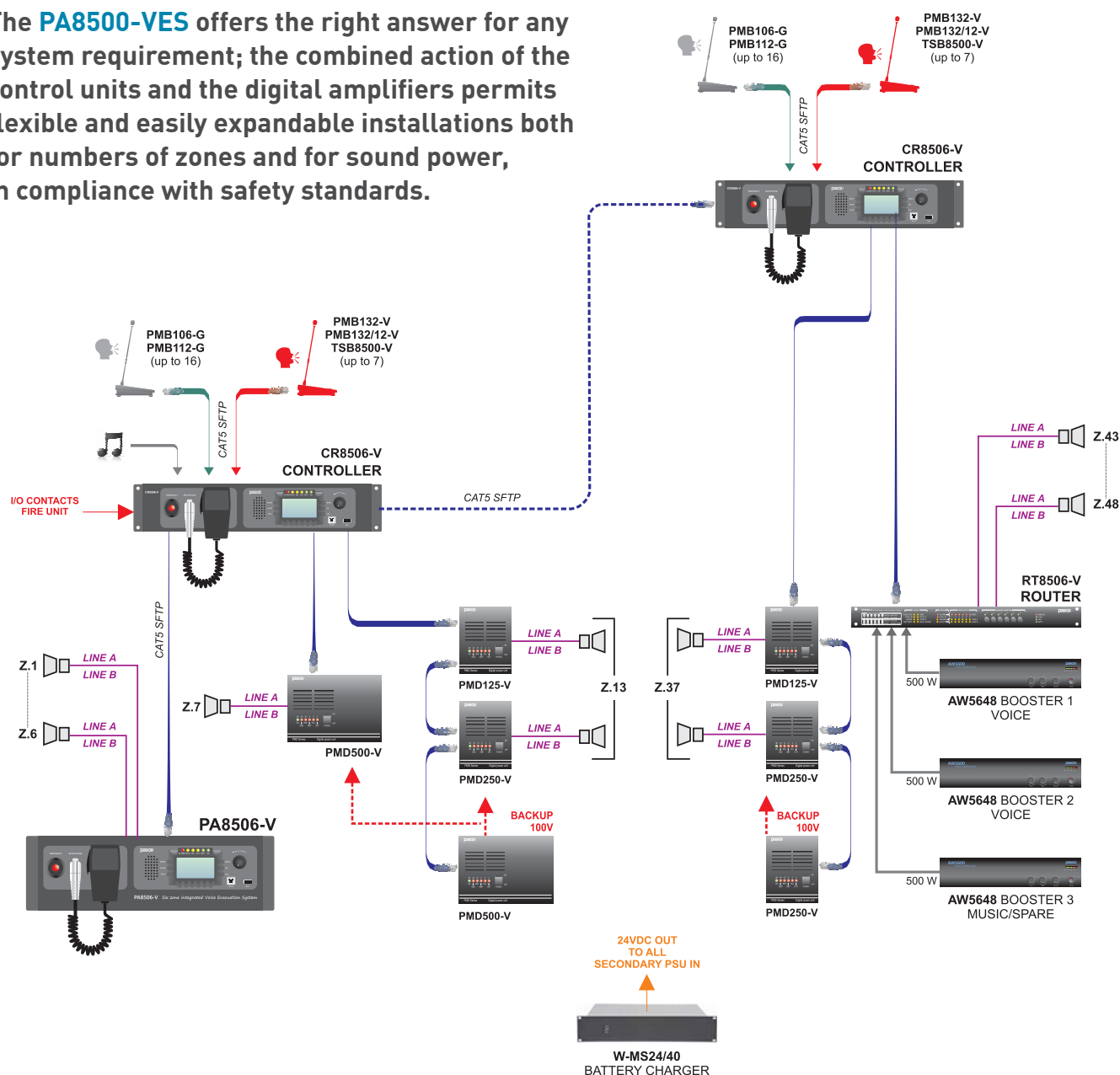
## APPLICATION DIAGRAM no. 3 | Multi-source PA system



This diagram refers to the use of the **MIM1000** system in the context of a typical Public Address (PA) sound broadcasting system. For further information on this type of installation, please refer to our General Catalogue of **PA Sound Broadcasting Systems**, consulting the section marked Appendix | "General Information on PA Sound Broadcasting Systems".



The **PA8500-VES** offers the right answer for any system requirement; the combined action of the control units and the digital amplifiers permits flexible and easily expandable installations both for numbers of zones and for sound power, in compliance with safety standards.



The complete architecture of **PA8500-VES** system is based on the controller **CR8506-V**, the management and diagnostics unit. It is highly recommended for big as well as small installations, where high performance of security and easiness are required.

CAT-5e SFTP network assures an easy connection of several units, controllers, routers, digital amplifiers and emergency and/or paging call stations. This solution performs in efficient and economic installation, allowing the usage of both local and centralized equipment.

Each **CR8506-V** can manage 6 lines to which the following units can be directly connected:

- **PMD** range of digital amplifiers, equipped with a diagnostics card (up to 16 per line).
- Router **RT8506-V** for up to 6 outputs zones with A & B speaker lines.
- **PA8506-V** Integrated Voice Evacuation Systems with 6 zones.

The remote consoles of the **PMB132** range and the **TSB8500-V** model are fully monitored, and allow greater operational and management flexibility for any service and/or emergency calls and/or prerecorded messages on the zones of the system.

The possibility to connect in daisy chain up to 6 controller **CR8506-V** and to manage up to 36 lines allows to realize up to 216 zones for voice evacuation/music.



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CR8506-V n. 0068/CPR/082-2013



Designed to carry out all the supervisory activities within the system, the **CR8506-V** takes care of managing and controlling all the audio signals (evacuation, warnings, service messages and background music).

CAT5/RJ45 network assures the easy connection of:

- 6 off control lines for **PMD** digital amplifiers and/or router **RT8506-V** and/or integrated voice evacuation system **PA8506-V**.
- 2 off redundant lines to connect other **CR8506-V** (max. 6).
- 2 off double lines for the emergency units of the **PMB132** and **TSB8500-V** ranges (max. total 7 units).
- 1 off double line for **PMB** calling stations (max 16).

#### FUNCTIONAL FEATURES

- Controlled emergency microphone.
- 2-channel broadcast system.
- Built-in message generator to broadcast pre-recorded messages (EVAC and ALERT).
- USB input for background music source.
- Back-up power amplifier management.
- Secondary emergency power supply input (24 Vdc).
- 7 off controlled input contacts.
- 3 off relay outputs.
- Graphic monochrome display 128x64 pixel.
- Complete diagnostic of system fault events.
- Standard rack mounting 19" (2 units).

MODEL	CR8506-V
<b>Inputs</b>	
USB-EXT.	USB input powered via the front panel – Type A socket
Emergency microphone	Dynamic, XLR-F socket on front panel
IN1 MIC (mode ON / OFF / Precedence / VOX)	Balanced XLR-F (activable 24 V Phantom supply)
IN2 (mode ON / OFF / Precedence / VOX)	<b>MIC:</b> Balanced XLR-F (activable 24 V Phantom supply); <b>LINE:</b> Balanced with terminals (HOT-COM-GND)
AUX	RCA stereo socket for sound source (BGM)
PAGING UNITS (1 line)	2 off RJ45 sockets per unit (PA) PMB106-G/PMB112-G and ACIO8136
EMERGENCY UNITS (2 lines)	4 off RJ45 for connection and dedicated emergency microphone units PMB132 / TSB8500-V
<b>Outputs</b>	
SLAVE LINK OUTPUT (6 lines)	6 off RJ45 for connection to RT8506-V / PMD / PA8506-V units
CR8506-V LINK (2 lines)	4 off RJ45 for redundant connection to CR8506-V units
Emergency controls	7 off inputs with diagnostics (RJ45) 3 OFF relays for signalling emergencies and failures (N.O-N.C. terminals)
<b>General information</b>	
Mains power supply / Consumption	230 Vac 50/60 Hz / 10 W
Vdc secondary power supply / Consumption	24 Vdc (min 22 Vdc ÷ max 28 Vdc) / 0,3 A
19" rack mounting (modular units)	Direct (2U)
Dimensions (W x H x D)	482 x 88 x 220 mm
Weight	4 kg





The router unit **RT8506-V** is the best solution for the sound systems offering a very interesting compromise between price and performance. Connected to a **CR8506-V** control line, it can drive up to 6 zones with external power amplifiers (**AW5600** range) to a maximum of 1000 W.

#### FUNCTIONAL FEATURES

- 6 off loudspeakers zones with double lines A+B.
- Double input 100 V for 1 or 2 voice amplifiers (IN 1 zone 1÷3, IN 2 zone 4÷6).
- 100 V input for music/standby amplifier.
- Front panel push button to switch ON/OFF the music on each single zone.
- RJ45 socket for CR8506-V connection.
- 7 off controlled and programmable input contacts.
- 6 off open collector outputs.
- 2 off relay outputs.
- Standard rack mounting 19" (1 unit).

Each output line consists of 2 speaker circuits (A & B) in order to guarantee the complete area coverage also in case of one loudspeaker circuit failure. The maximum system configuration includes 6 controllers connected to 36 routers (6 for each CR8506-V) for a total of 216 zones.

The **RT8506-V** router can be used with power signals (amplifier 100 V output). Two different configurations are possible: in the first one you can connect 2 amplifiers (one for music and one for speech); in the second one it is possible to manage 2 voice amplifiers (3 zones each) and one music amplifier. In both cases all amplifiers are constantly monitored and the music one can be also used as backup: in case of a failure it automatically replaces the voice amplifier.

With the RT8506-V router it is possible to use the certified **AW5600** range boosters. Two models are available: one with an output of 240 W (**AW5624**) and the other with an output of 480 W (**AW5648**). The amplifiers of the AW5600 range are the ideal products for emergency systems. There is a specific switch on the rear panel for disabling all the front-panel controls (tone and volume controls), preventing accidental changes to the levels set during commissioning.



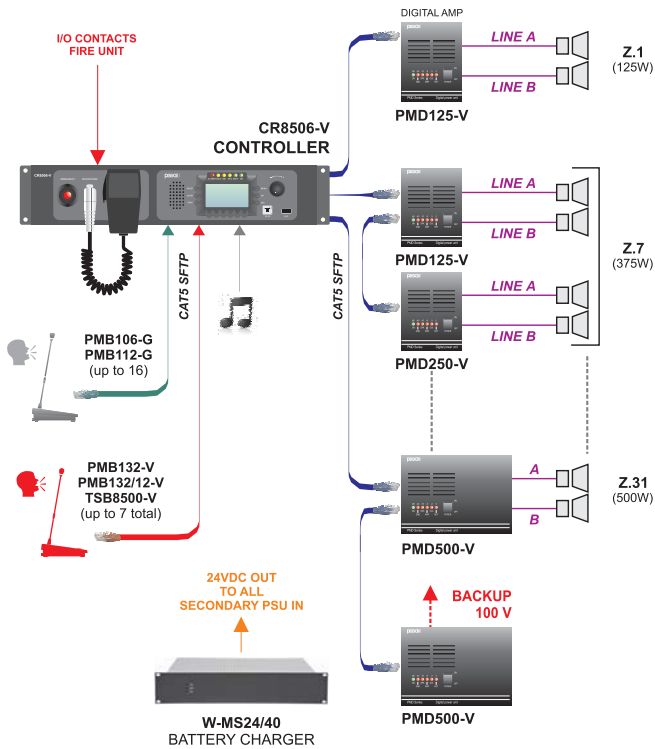
**EN 54-16:2008 certification**  
RT8506-V n. 0068/CPR/082-2013

For greater details on these boosters, see the appropriate section on Page 28.

MODEL	RT8506-V
Mains power supply	230 Vac 50/60 Hz
Consumption @ 230 Vac	12 W
External DC power supply	24 Vdc
Consumption @ 24 Vdc	0,5 A
Maximum power switchable for single zone	500 W
19" rack mounting (modular units)	Direct 19" (1U)
Dimensions (W x H x D)	482 x 44 x 220 mm
Weight	4 kg

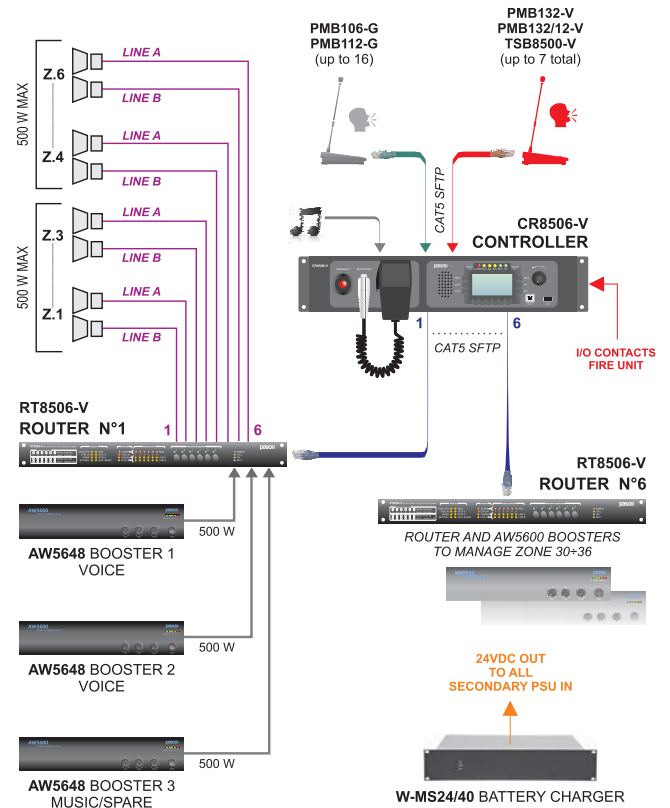
### CR8506-V Controller and Digital Amplifier PMD Series

It is possible to connect 6 controllers CR8506-V to each other and to manage up to a maximum of 36 groups of PMD digital amplifiers, obtaining a 2 channel system with 36 output zones with double line.

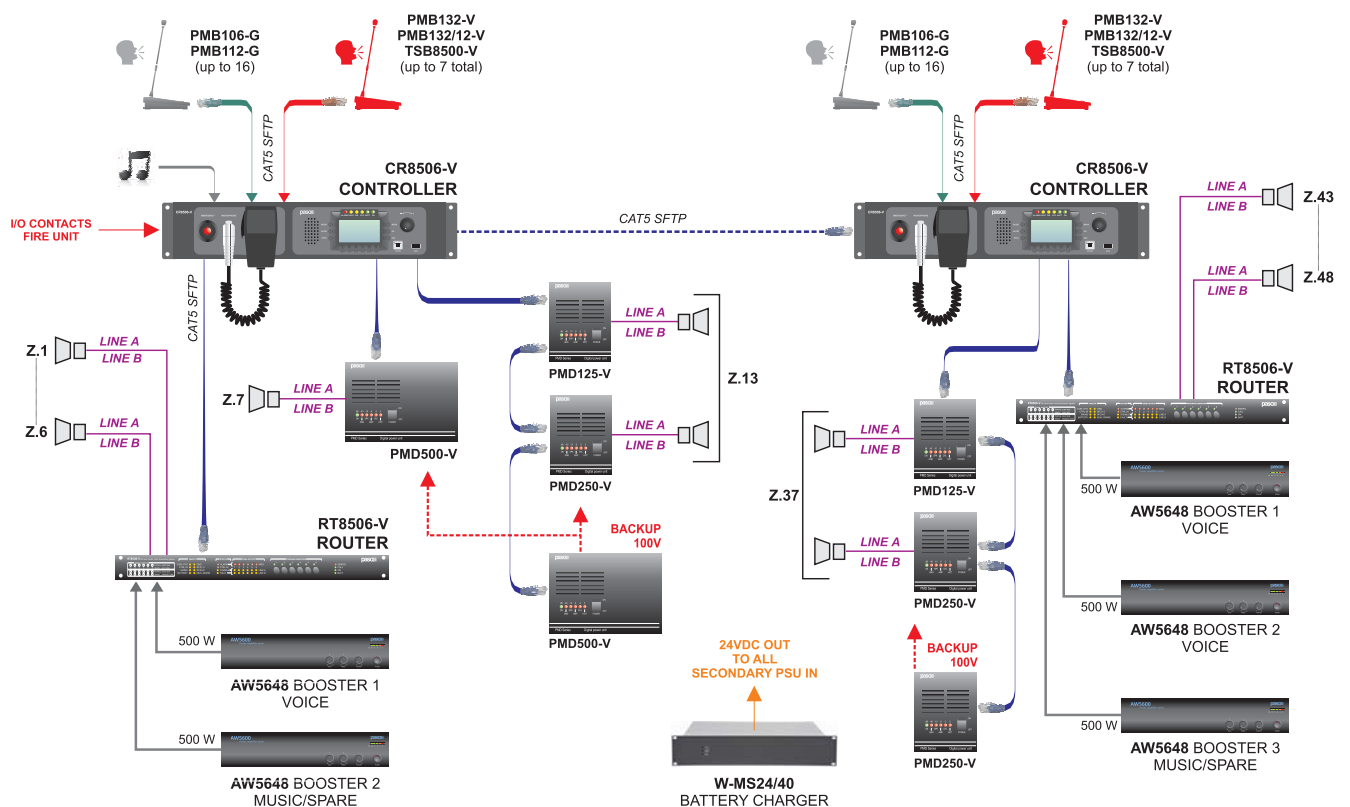


### CR8506-V Controller and RT8506-V Router

In a system which includes 6 controller units, each one connected to a maximum of 6 routers RT8506-V, it is possible to obtain up to 216 double line output zones.



### PA8500-VES • Solution with a Mixed Configuration





The **PA8506-V** is PASO sound management solution which integrates emergency and general purpose broadcast functions. It enables background music and general or zone calls without interfering with its diagnostic routine.

- **ISO 7240-19 and EN 50849** compliance.
- **Message/alarm generator**, paging, BGM.
- **Up to 12 output zones (2 x PA8506-V)**  
Two speaker circuits each zone (A & B).
- **Two-channel broadcast system.**
- **Two built-in class D amplifiers**  
The second one for music and also as stand-by.
- **Full digital audio control (DSP).**

#### ✓ Excellent quality/price ratio

The **PA8506-V** has all the functional features normally provided by more expensive systems, and it is therefore characterized by an exceptionally favourable price/performance ratio.

#### ✓ Rack mounting

The optional **AC8506** brackets are available for rack-mounting of the PA8506-V.

The **PA8506-V** is specially designed for easy installation and operation in a wide range of applications where both emergency voice alarm systems and public address systems are required, always according to the voice evacuation safety standards. Other than paging and music broadcast operations, the PA8506-V is able to send alarm announcements in emergency situations and according to **EN54-16** standard, the built-in surveillance function continuously checks the system for all possible failures.

The equipment is a fully 2-channel broadcast system including 2-built in class D amplifiers (2 x 250 W RMS, one for music and one for speech). Both amplifiers are continuously monitored. The music amplifier operates also as stand-by amplifier: in case of speech amplifier failure, the music amplifier automatically replaces it. It's possible to connect easily (by simple CAT-5e SFTP cable) two main PA8506-V to create systems of up to 12 zones, for a maximum of 1000 W and connect up to 14 emergency microphone units (thanks to the **PMB132** range).

The speaker output section consists of 6 separated lines; each line has its own internal music level control. Furthermore, each output line consists of 2 speaker circuits (A & B) in order to guarantee the complete area coverage also in case of one loudspeaker circuit failure.

The front controls and the LCD display allow easy system setup.



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**PA8506-V n. 0068/CPR/082-2013**




## MAIN FUNCTIONAL, EMERGENCY AND SAFETY FEATURES

- 2 off built-in 250 W RMS class D power amplifiers.
- Management of an external 250 W amplifier to increase power (AW5624).
- Up to 7 remote emergency units (CAT-5e SFTP cable).
- Up to 16 paging units, 7 priority levels (CAT-5e SFTP cable).
- Balanced microphone input (IN 1) with Phantom power supply and precedence contact.
- Balanced microphone or line input (IN 2) (MIC), priority contact or automatic precedence (VOX).
- Balanced line input (IN 3) with automatic precedence (VOX).
- Auxiliary line input for an external music source.
- USB input for background music source.
- 6 off open collector outputs (status/override to bypass attenuators).
- 8 off programmable and controlled input contacts.
- 2 off relay outputs for "emergency" and "failure" conditions.
- Built-in loudspeaker for channel monitoring and acoustic failure signalling (beep).
- Graphic 128x64 pixel monochrome display, for displaying multiple windows management.
- Multi-function keys and knob help to navigate through the menus.
- Emergency zone disabling and Do Not Disturb functions (DND).
- Frontal Fireman's microphone. It works only under Emergency Manual and has priority over prerecorded messages of an emergency. The microphone capsule is controlled by the internal diagnostic system.
- Emergency button with LED (red) collected for the activation of the Emergency Manual mode. Allows access to the system, with absolute priority, from the "State of Quiet" or during the Emergency Automatic ongoing, previously activated by external devices.
- Remote emergency microphones units, PMB132 range.
- Control and monitoring of the integrity of the critical path (from the emergency signal sources to the loudspeaker lines).
- Continuous loudspeaker line monitoring (integrity and dispersion to earth) without interruption of BGM or paging calls.
- Two output loudspeaker lines for each zone (A & B).
- Built-in message generator to broadcast prerecorded messages (EVAC and ALERT).
- Back-up power amplifier management (built-in unit).
- Complete diagnostic of system fault events.
- Management of a secondary source of 24 Vdc power with a battery-charging unit.

MODEL		PA8506-V		
Rated output power (230 Vac / 24 Vdc)		250 + 250 W RMS / 160 + 160 W RMS (dual voice and music channel)		
Inputs	IN 1	IN 2	IN 3	AUX
Type	Balanced XLR (with activatable 21 V phantom power supply)		Balanced with terminals (HOT-COM-GND)	Unbalanced RCA
Programmable mode	ON/OFF/PREC./MIX IN 2	ON/OFF/PREC./VOX	ON/OFF/VOX	-
Sensitivity / Impedance	Min. 3 mV - Max 100 mV / 1,8 kΩ	MIC: Min. 3 mV - Max 100 mV / 1,8 kΩ	Max 3600 mV / 3 kΩ	Max 1800 mV / 31 kΩ
		LINE: Max 1800 mV / 31 kΩ		
Frequency response / S/N ratio	240 ÷ 20.000 Hz / 63 dB	MIC: 240 ÷ 20.000 Hz / 63 dB LINE: 60 ÷ 20.000 Hz / 84 dB	90 ÷ 20.000 Hz / 86 dB	60 ÷ 20.000 Hz / 84 dB
Dedicated inputs	Dynamic emergency microphone, XLR socket - Paging Units (PMB106-G, PMB112-G and ACIO8136), 2 RJ45 Emergency Units, RJ45 - USB-EXT., Tipo A			
External amplifier input (EXT. AMP. IN)	Input with terminals 0-70-100 V (max 250 W RMS)			
Constant voltage outputs	6 zones for dual-line (A/B) 100 V lines – Tot. 12 pairs of terminals (2,5 mm <sup>2</sup> )			
Load impedance	Min. 40 Ω for total group of zones 1 to 6 with external amplifier: Min. 40 Ω for total group of zones 1 to 3 / Min. 40 Ω for total group of zones 4 to 6			
External amplifier output	Balanced XLR			
Sensitivity / Impedance	1 V / 500 Ω			
Frequency response / S/N ratio	40 ÷ 20.000 Hz / 84 dB			
Monitor BF OUT	Loudspeaker built into front panel 1 W / 8 Ω and rear output with terminals (HOT-GND), 1 V / 400 Ω			
Emergency controls	Programmable to 'normally open' or 'normally closed states'			
Type	8 inputs with diagnostics. Terminals and service power supply: 24 Vdc (CONTROL INPUTS) 6 open-drain outputs, max 200mA. Terminals and service power supply: 24 Vdc (CONTROL OUTPUTS) 2 relays for signalling emergencies and failures, N.O-N.C. terminals			
Mains power supply	230 Vca 50/60 Hz			
Max consumption @ rated output power RMS	(500 W System) P = 650 W/800 VA (250 W System) P = 370 W/480 VA			
Typical consumption with voice signal	(500 W System) P = 160 W/200 VA (250 W System) P = 90 W/120 VA			
Consumption with no signal (test tone only)	P = 30 W/45 VA			
Vdc secondary power supply	24 Vcc (min 22 Vdc ÷ max 28 Vdc)			
Max consumption @ 24 Vdc (@ 28 Vdc)	500 W System = 17 A (21 A) 250 W System = 9 A (11 A)			
Typical voice signalconsumption @ 24 Vdc (@ 28 Vdc)	500 W System = 4,3 A (5 A) 250 W System = 2,2 A (2,5 A)			
Consumption with no signal (test tone only)	0,8 A			
Operating conditions	Temp.: +5° C to +40° C / Humidity: 25%-75% non-condensing			
19" rack mounting	AC8506 optional bracket (height: 3U + 1 U support brackets)			
Dimensions (W x H x D)	439 x 132 x 387 mm			
Weight	20,5 kg			

### Microphone units with zone selection



To **PA8506-V** can be easily and quickly connected up to 16 microphone paging units (**PMB106-G** and **PMB112-G**, page 31) and up to 7 microphone emergency units **PMB132-V** and **PMB132/12-V**, page 30, which allow to send messages either to one or more zones. The usage of shielded cables CAT5e SF/UTP is needful.

## Microphone units with zone selection



To PA8506-V can be easily and quickly connected up to 16 microphone paging units (PMB106-G and PMB112-G, page 31) and up to 7 microphone emergency units PMB132-V and PMB132/12-V, page 30, which allow to send messages either to one or more zones. The usage of shielded cables CAT5e SF/UTP is needful.



PMD500-V

PMD125-V  
PMD250-V

Careful design and a choice of very reliable hi-tech components led to the creation of the **PMD** range of Class D amplifiers, featuring an extremely compact size and low energy consumption.



#### Special applications

All **PMD** amplifiers can also be used without a **PA8500-VES** system whenever small layout dimensions combined with great reliability are required.



#### Protection

In addition to conventional protection in the form of fuses, these amplifiers have electronic protection devices and circuit-breakers with automatic resetting, protecting them from the possible risk of damage due to overloads.



#### Card cage

The **PMD** amplifiers can be mounted on 19" racks using the **PMS2001** card-cage.

The **PMD** amplifiers include a diagnostics board to make a test of the correct unit operation and the check of the loudspeaker's line integrity. They are directly connected to **CR8506-V** controller by means of CAT5 shielded cable and they can be used to create high-power areas. It's possible to connect up to 16 **PMD** units in cascade fashion to each of the six output lines (zones) of the **CR8506-V**. It is possible to configure one amplifier in each group as a stand-by unit and the fact that each amplifier is powered independently makes the system extremely reliable and in line with safety standards.

#### FUNCTIONAL FEATURES

- 230Vac / 24Vdc power supply.
- 'Stand-alone' and remote-controlled operation.
- Double RJ45 input socket (for connecting more than one amplifier in parallel).
- Two audio inputs.
- Front-panel LEDs indicating the output level/status.
- Forced fan cooling with electronic control & protection circuit.
- Pull-out terminal block.

#### LOCAL CONTROLS

- Output volume control.
- Selection of the amplifier input.
- Activation of the LOW-CUT filter.

#### DIAGNOSTICS

- Diagnostics of the main functions of the amplifier.
- Checking and measurement of the impedance of the loudspeaker line (A and B).
- Check and exclusion of short-circuited loudspeaker lines.
- Check of earth connections (GND fault).



EN 54-16:2008 certification

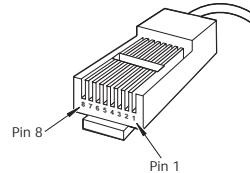
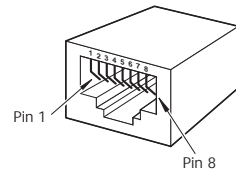
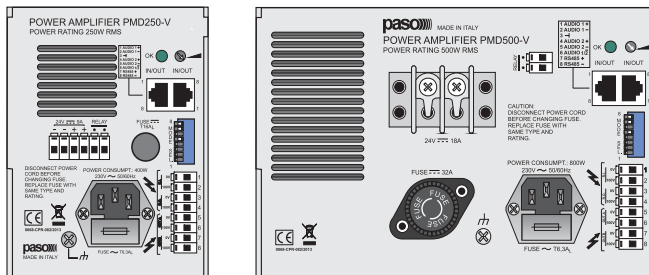
PMD range n. 0068/CPR/082-2013

## CONNECTIONS

There are two RJ45 sockets on the rear panel of the unit. Their connections are in parallel with one another to enable audio connections at line level and for serial communication.

Audio Input 1 and 2 are balanced electronically.  
All the connectors must be shielded RJ45 connectors.

A pull-out terminal strip is available for connection to the loudspeaker lines and to the spare amplifier, if any.



## RJ45 input

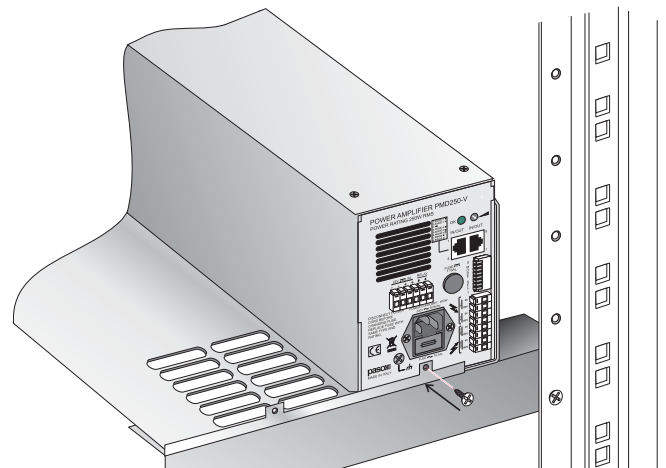
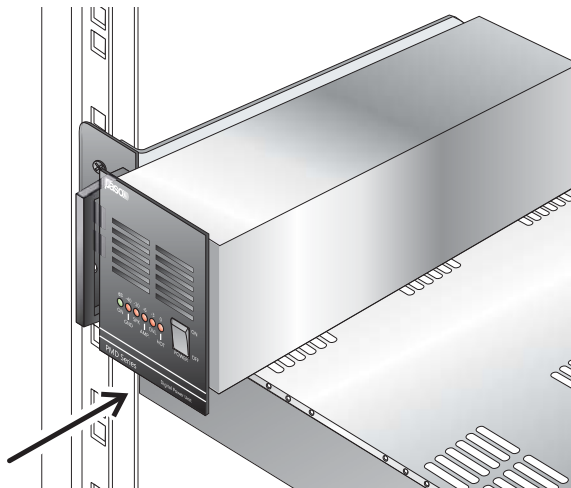
Pin	Description
1	Audio 1 +
2	Audio 1 -
3	GND
4	Audio 2 +
5	Audio 2 -
6	Audio switch
7	Serial RS485 +
8	Serial RS485 -
Shield	GND

## Power outputs

Pin	Description
1	Stand-by IN (0V)
2	Stand-by IN (100V)
3	Stand-by OUT (0V)
4	Stand-by OUT (100V)
5	Output A (0V)
6	Output A (100V)
7	Output B (0V)
8	Output B (100V)

## RACK-MOUNTING WITH PMS2001 CARD CAGE

To install PMD amplifiers on 19" racks it is necessary to use the card-cage provided for this purpose. PMD amplifiers differ from one another only in terms of output power and size (two 125 W or 250 W amplifiers occupy the same space as one 500 W amplifier). Each **PMS2001** card-cage can contain two 500 W amplifiers or four PMD125-V or PMD250-V amplifiers, or any intermediate configuration.



MODEL	PMD125-V	PMD250-V	PMD500-V
Rated output power @230 Vac	125 W RMS	250 W RMS	500 W RMS
Power outputs	100 V		
Distortion @ rated power	< 0,05%		
Input	Double RJ45, In/Out audio/RS485 from CR8506-V		
Frequency response	90 ÷ 20.000 Hz		
Low Cut filter (- 3 dB)	330 Hz		
Power supply	230 Vac ± 10% - 50/60 Hz / 24 Vdc		
Power consumption at 230 Vac	195 W	410 W	740 W
Current consumption at 24 Vdc	4.4 A	7.6 A	16.3 A
19" rack mounting	PMS2001 card-cage (H: 3U + 1U for brackets support)		
Mounting units to each PMS2001	4		
Dimensions (W x H x D)	100 x 130 x 395 mm		
Weight	8,4 kg	9,2 kg	14,8 kg





Thanks to the great reliability of the protection circuits used, combined with an attractive appearance and the very tough structures, the **AW5600** range constitutes the ideal product for quality amplification, with a particularly interesting price/performance ratio.



#### Disabling of the front-panel controls

This specific function makes it possible to prevent the levels set at the time of commissioning from being altered accidentally (rear **NORM/DIRECT** switch).

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.



#### EN 54-16:2008 certification

AW5624 n. 0068/CPR/082-2013

AW5648 n. 0068/CPR/082-2013

MODEL	AW5624	AW5648
Rated output power @230 Vac	240 W RMS	480 W RMS
Power outputs	100-70-50 V, 8 Ω	
Distortion @ rated power	< 1%	
Line input	Balanced XLR, Unbalanced RCA	
Frequency response	30 ÷ 20.000 Hz	
Power supply	230/115 Vac ± 10% - 50/60 Hz / 24 Vdc	
Power consumption at 230 Vac	535 W (610 VA)	1160 W (1330 VA)
Current consumption at 24 Vdc	13.2 A	33 A
19" rack mounting	AC5660 optional brackets with AC50 lateral support (H: 2U)	
Dimensions (W x H x D)	432 x 88 x 272 mm	432 x 88 x 360 mm
Weight	10.5 kg	16 kg



The **TSB8500-V** station combines all the features of the PMB132 range with a backlit 7" touch-screen display, to be used for selecting the zones and for configuring the unit itself. Six function keys (F1 to F6) are available for creating groups of zones for calling back.

Each station has its own RJ45 connector for connection by means of a direct Cat. 5e SFTP cable. The connectors must be of the shielded RJ45 type.

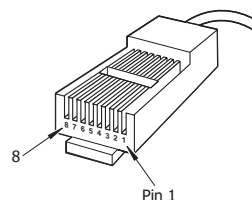
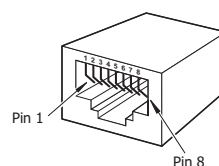


EN 54-16:2008 certification  
TSB8500-V n. 0068/CPR/038-2016



### Choice of microphones

Each **TSB8500-V** station has to be completed with a gooseneck microphone (**MC132-V**) or a hand-held microphone with a PTT key (**M132-V**).



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

MODEL	TSB8500-V
No. of zones selectable	1 ÷ 216
Typical output level	300 mV
Frequency response	20 ÷ 20.000 Hz
Distortion	< 1%
LOW CUT filter	-10 dB / 100 Hz
S/N ratio	> 60 dB
Connections	RJ45 (IN/OUT)
Power supply	24 Vdc
Absorption @24Vdc	165 mA
Dimensions	230 x 80 x 200 mm
Weight	1,6 kg



### Optional wall mounting

Wall-mounting is possible with **AR8500** cabinet (optional).



AR8500



The remote units of the **PMB132** range are fully monitored, and allow greater operational and management flexibility for any service and/or emergency calls and/or prerecorded messages on the zones of the system.

The LEDs on the front panel provide the main information on the status of the emergency system and on any failures. The **PMB132-V** station enables a single All-Call to be made; if the alarm messages have to be sent to separate zones, on the other hand, it will be necessary to use the **PMB132/12-V** station, which enables a maximum of 12 zones to be selected.



#### EN 54-16:2008 certification

PMB132-V n. 0068/CPR/082-2013

PMB132/12-V n. 0068/CPR/082-2013

MODEL	PMB132-V	PMB132/12-V
No. of zones selectable	-	12
Typical output level	300 mV	
Frequency response	130 ÷ 19.000 Hz	
Distortion	< 1%	
LOW CUT filter	-3 dB / 380 Hz	
S/N ratio	> 60 dB	
Connections	RJ45 (IN/OUT)	
Power supply	24 Vdc	
Absorption @24Vdc	60 mA	130 mA
Dimensions	140 x 80 x 200 mm	230 x 80 x 200 mm
Weight	0,77 kg	1,55 Kg

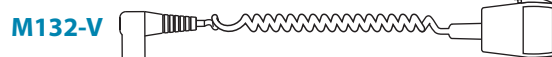
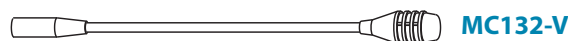
#### FUNCTIONAL FEATURES

- Fully monitored.
- Emergency key
- Live emergency / service calls.
- Sending of pre-recorded Evacuation/Alert messages.
- Standard broadcast calls.
- Zone-selection keys (PMB132/12-V model only).
- Faults/Failures LEDs.
- Reset of emergency messages.
- Muting of the buzzer for failure detection.



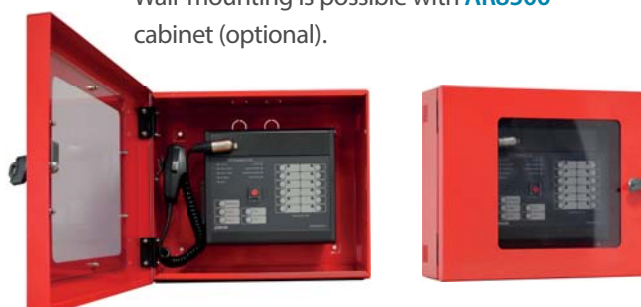
#### Choice of microphones

Each PMB132-V and PMB132/12-V station has to be completed with a goose-neck microphone (MC132-V) or a hand-held microphone with a PTT key (M132-V).



#### Optional wall mounting

Wall-mounting is possible with **AR8500** cabinet (optional).







PMB106-G



PMB112-G



PMB112-EG

**Standard PMB range pre-amplified units can be used in Voice Evacuation Systems to send all-calls and/or zone calls.**

The units are connected to one another in cascade formation, and the connecting cables (CAT5e SF/UTP) carry both the analogue audio signal and the digital signal for the controls and station addresses.

**PMB106-G**

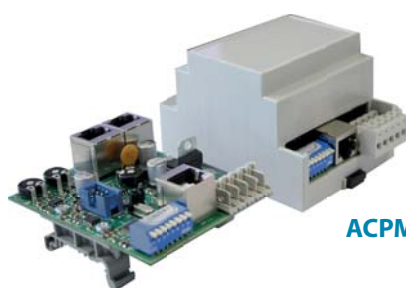
Pre-amplified station with 6 programmable zone-selection keys and associated LEDs, a general selection key, a PTT key, a key with a LOCK function for long announcements and a LED showing when the microphone is activated/busy.

**PMB112-G**

Pre-amplified station with 12 programmable zone-selection keys and associated LEDs, a general selection key, a PTT key, a key with a LOCK function for long announcements and a LED showing when the microphone is activated/busy.

**PMB112-EG**

Expansion keypad for PMB112-G stations with 12 programmable zone-selection keys, indicator LEDs and a general selection key. It is possible to cascade up to two of these units.



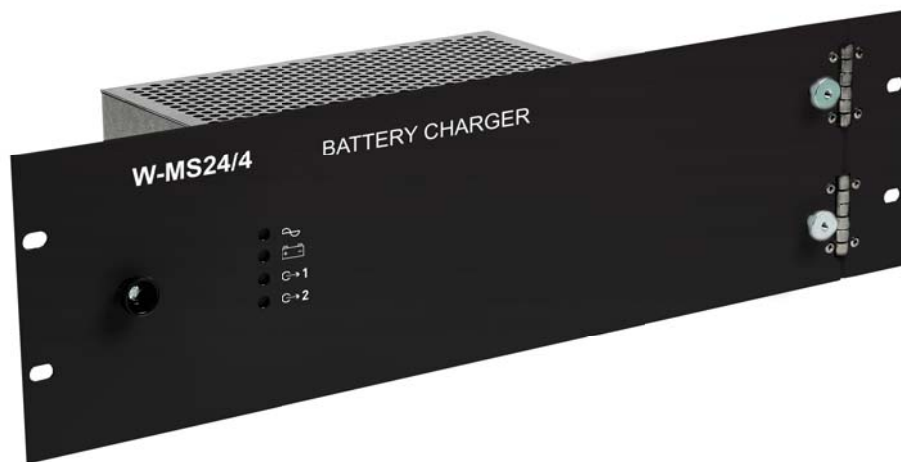
ACPMB

ACPMB-DIN

**ACPMB, ACPMB-DIN**

Interface modules for connecting standard bases and/or microphones for single dialling service calls (B700, B711 and/or B53 ranges) on the same CAT. 5 line of the PMB stations (see page 42 on *PA Sound Broadcasting* general catalogue).

MODEL	PMB106-G	PMB112-G	PMB112-EG
Specifications	Electret microphone, P.T.T. key, dynamics limiter		-
No. of zones selectable	6 + ALL	12 + ALL	12+ALL
Typical output level		2,2 V max	
Frequency response		100 ÷ 14.000 Hz	
Connections		RJ45 (IN/OUT)	
Power supply		18 / 36 Vdc	
Absorption	16 mA		22 mA
Dimensions		116 x 416 x 200 mm	
Weight		0,6 kg	



The **W-MS24** range battery chargers have been designed specifically for voice evacuation systems.

The **W-MS24/4** charging unit, featuring low energy consumption, has an aluminium cabinet covered in ABS. It ensures continuity of services for your system, with an exceptionally good price/performance ratio.

The ease of installation and cabling of this unit, with two charging outputs enabling a larger number of applications and the rated maximum battery-charging capacity not exceeding 55 Ah, are ideal features for using it with the **PA8506-V** integrated voice evacuation system in medium-sized to small installations, always in accordance with the applicable provisions of law.



This unit is suitable for installing directly on a 19" rack (H: 3U).



#### EN 54-4 certification

W-MS24/4 n. 0333-CPR-075192

MODEL	W-MS24/4
Power supply	230 Vac $\pm$ 15% - 50/60 Hz
Maximum load output current	4 A
Main load outputs @ 24 Vdc	2 x 4 A
Aux load outputs @ 24 Vdc	-
Battery capacity (minimum/maximum)	7 Ah min – 55 Ah max
Rated output rectifier current	3 A
Fault indications	Mains fault, battery fault, output voltage fault
Low voltage disconnection threshold	21,6 V $\pm$ 3%
19" rack mounting	Direct (Height: 3 U)
Dimensions (W x H x D)	482 x 133 x 110 mm
Weight	3 kg



The **W-MS24/40** and **W-MS24/150** battery chargers have been designed specifically for voice evacuation systems. They are based on microprocessor-driven devices, able to charge lead batteries (back-up batteries connected to the voice evacuation system) and, at the same time, to supply power to auxiliary equipment. These chargers meet in full the requirements and ensure maximum charging currents of 6 and 12 A respectively.

**EN 54-4 certification**

W-MS24/40 n. 0333-CPR-075382

W-MS24/150 n. 0333-CPR-075381



Both models are suitable for mounting directly on 19" racks (H: 2U).

MODEL	W-MS24/40	W-MS24/150
Power supply	230 Vac $\pm$ 15% - 50/60 Hz	
Maximum load output current	40 A	150 A
Main load outputs @ 24 Vdc	2 x 20 A	6 x 40 A
Aux load outputs @ 24 Vdc	3 x 5 A	
Battery capacity (minimum/maximum)	24 Ah min – 110 Ah max	65 Ah min – 225 Ah max
Rated output rectifier current	6 A	12 A
Fault indications	Mains fault, battery fault, output voltage fault	
Low voltage disconnection threshold	21,6 V $\pm$ 3%	
19" rack mounting	Direct (Height: 2 U)	
Dimensions (W x H x D)	432 x 88 x 399 mm	
Weight	3,1 kg	5,4 kg



PASO offers a full range of speaker units designed for use in voice alarm systems and certified according to EN54-24.

These speakers are equipped with a proper ceramic terminal block and thermal fuse that ensure the safeguarding of the speaker line connecting the loudspeakers in the case of any failure by one or more speakers connected to it.



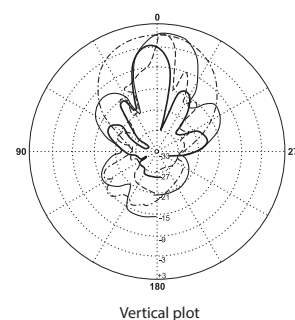
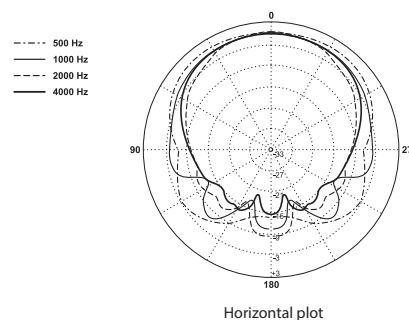


**C7200-EN**  
100 W, H=849 mm

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).

MODEL	C7200-EN
Rated power	100 W
Adjustable power	100 / 50 W
Rated impedance	8 Ω
Loudspeakers	6 Wf + 4 Tw
Characteristics	Aluminium structure
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 support (not included)
Colour	White
Dimensions (W x H x D)	130 x 849 x 133 mm
Weight	8 kg



**EN54-24:2008 certification**  
n. 0068/CPR/058-2013

#### NOTE

It can be wall mounted using the **AC7200** fitting (not included).

**C6060-EN**

60 W, H=368 mm

**C6060N-EN**

60 W, H=368 mm

**C6120-EN**

120 W, H=704 mm

**C6120N-EN**

120 W, H=704 mm

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 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	140÷20.000 Hz	140÷20.000 Hz	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





**C420-EN**  
20 W, H=520 mm



**C430-EN**  
30 W, H=725 mm



**C440-EN**  
40 W, H=890 mm

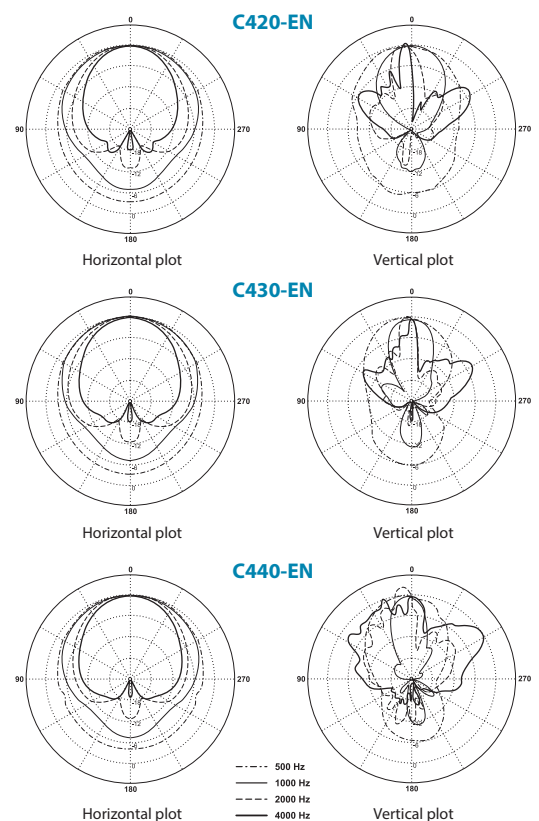
A compact size and high acoustic performance are the typical features of the sound columns of the **C400-EN** range.

They consist of a weight-bearing structure made of extruded aluminium painted pale grey, a solid front grille and sealed shockproof end panels. Each **C400-EN** column is 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). Connections to the various sockets are made via the cable coming out of the column.

These columns have a swivelling support for quick securing to a wall. 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.



**EN54-24:2008 certification**  
n. 0068/CPR/039-2016



MODEL	C420-EN	C430-EN	C440-EN
Rated power	20 W	30 W	40 W
Adjustable power	20 / 10 / 5 W	30 / 15 / 7,5 W	40 / 20 / 10 W
Sound pressure SPL P <sub>nom</sub> /1m	105 dB	108 dB	109 dB
Efficiency 1W/1m	92 dB	93 dB	93 dB
Frequency response	180 ÷ 16.000 Hz	180 ÷ 16.000 Hz	150 ÷ 14.000 Hz
Dispersion angle @ 2 kHz	H: 150° / V: 35°	H: 150° / V: 20°	H: 140° / V: 20°
Protection degree	IP 44	IP 44	IP 44
Mounting	Support S4-B	Support S4-B	Support S4-B
Colour	Light grey	Light grey	Light grey
Dimensions (W x H x D)	95 x 520 x 80 mm	95 x 725 x 80 mm	95 x 890 x 80 mm
Weight	3,5 kg	4,8 kg	5,65 kg



**C1050-EN**  
50 W



**C1100-EN**  
100 W



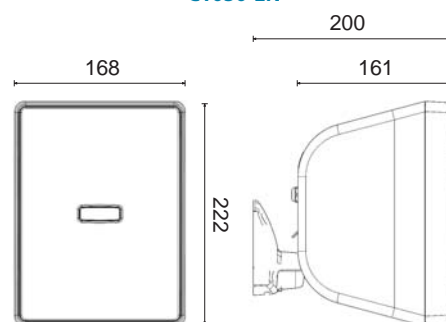
**C1200-EN**  
200 W

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

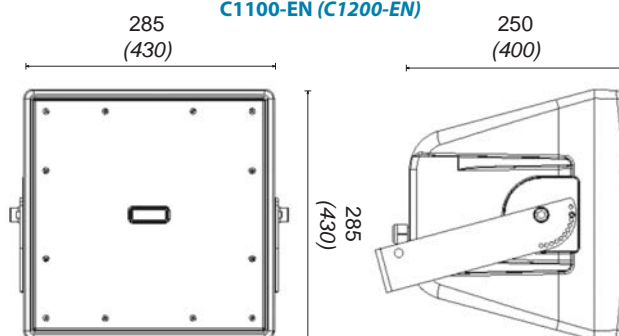
All speakers of the new **C1000-EN** range feature an IP55 and, due to their structure made of self-extinguishing polypropylene with **UL 5VB** flammability rating, are now certified according to **EN54-24** standard. All models of the series have a ceramic terminal block and thermal fuse installed inside 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.

**C1050-EN**



**C1100-EN (C1200-EN)**



EN54-24:2008 certification

C1050-EN n. 0068/CPR/070-2019

C1100-EN n. 0068/CPR/012-2019

C1200-EN n. 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
Sensitivity 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



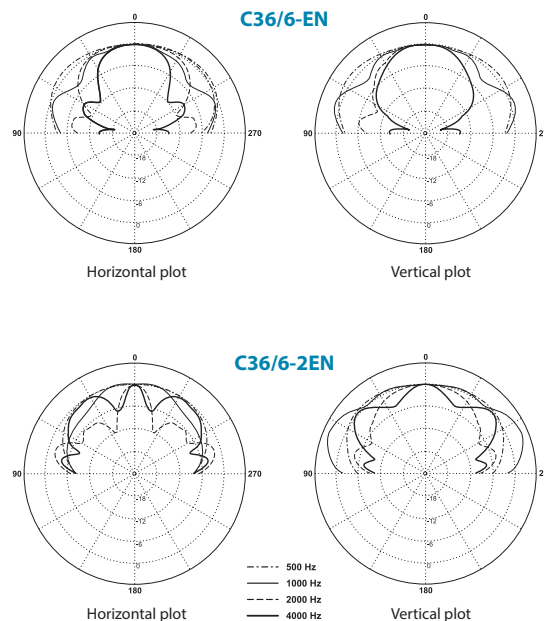
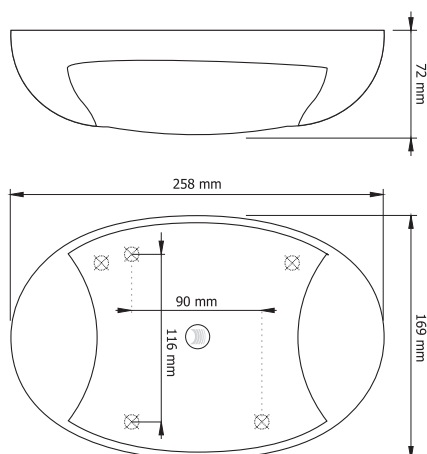
**C36/6-EN**  
6 W



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

The speaker units of the **C36-EN** range, 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.

They can be either wall-mounted or ceiling-mounted. The housing is made of white self-extinguishing ABS (UL94-V0) with a metal front grille. Each unit has a ceramic terminal block and a thermal fuse. **C36/6-EN** speaker units 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); **C36/6-2EN** model, on the other hand, has two loudspeakers and is particularly suitable for installation in passageways and corridors.

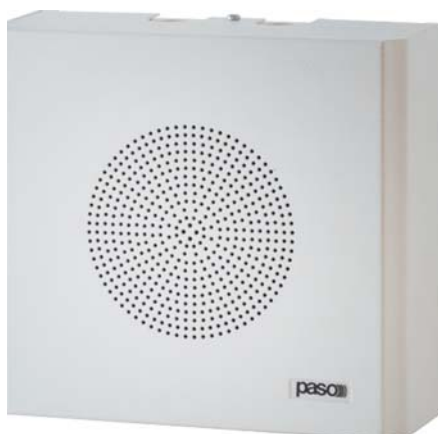


#### EN54-24:2008 certification

C36/6-EN n. 0068/CPR/033-2013

C36/6-2EN n. 0068/CPR/039-2016

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

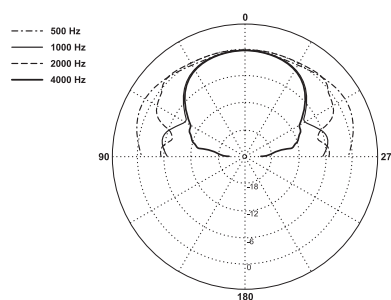


**C37/6-EN**  
6 W

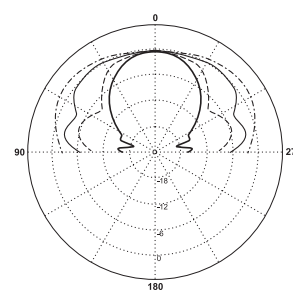
The **C37/6-EN** speaker unit has been developed specifically for use in a vast range of applications. It can be wall or ceiling-mounted.

The structure of the **C37/6-EN** speaker unit 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.



Horizontal plot



Vertical plot



**EN54-24:2008 certification**

C37/6-EN n. 0068/CPR/033-2013

MODEL	C37/6-EN
Rated power	6 W
Adjustable power	6 / 3 / 1,5 W
Loudspeakers	Metal
Characteristics	1 broadband
Sound pressure SPL Pnom/1m	99 dB
Efficiency 1W/1m	91 dB
Frequency response	150 ÷ 15.000 Hz
Dispersion angle @ 2 kHz	90°
Protection degree	IP 32
Mounting	Wall or ceiling mounting with screws
Colour	White
Dimensions (W x H x D)	210 x 190 x 70 mm
Weight	1,6 kg



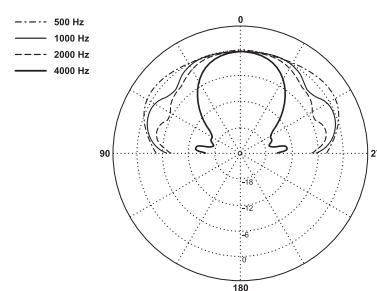


**C44/12-EN**  
12 W

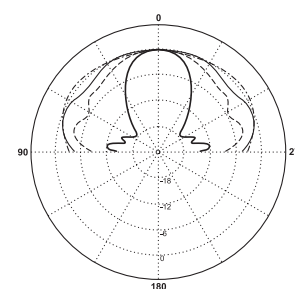
The ideal application for **C44/12-EN** speaker units is in hospitals, hotels, offices, schools, shops or anywhere where flush-mounting and a discreet and elegant appearance are required.

Made of self-extinguishing plastic material (UL94-V0) with a metal front grille, the **C44/12-EN** model 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.



Horizontal plot



Vertical plot



**EN54-24:2008 certification**

C44/12-EN n. 0068/CPR/033-2013

MODEL	C44/12-EN
Rated power	12 W
Adjustable power	12 / 6 / 3 W
Loudspeakers	ABS UL94-V0 body, metal grille
Characteristics	1 broadband
Sound pressure SPL P <sub>nom</sub> /1m	99 dB
Efficiency 1W/1m	89 dB
Frequency response	150 ÷ 15.000 Hz
Dispersion angle @ 2 kHz	120°
Protection degree	IP 32
Mounting	Flush-mounting wall/ceiling box
Colour	White
Dimensions (W x H x D)	165 x 280 x 90 mm
Weight	2 kg

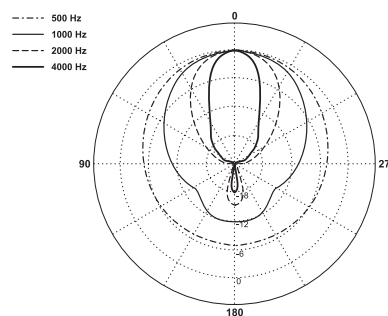


**TRX20-EN**  
20 W, Ø 213 mm

The **TRX20-EN** horn speaker unit, 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.

The housing is made of die-cast aluminium with stainless steel screws and brackets, while the horn is made of aluminium sheeting. It 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.

It is equipped with a thermal cutoff and a flameproof connecting cable (length: 80 cm).



**EN54-24:2008 certification**

TRX20-EN n. 0068/CPR/033-2013

MODEL	TRX20-EN
Rated power	20 W
Adjustable power	20 / 15 / 10 / 5 / 2,5 W
Characteristics	Die-cast aluminium body, aluminium horn
Sound pressure SPL Pnom/1m	116 dB
Efficiency 1W/1m	103 dB
Frequency response	500 ÷ 5.000 Hz
Dispersion angle @ 2 kHz	70°
Protection degree	IP 66
Mounting	Swivelling bracket
Colour	Light grey
Dimensions (Ø x D)	213 x 230 mm
Weight	1,8 kg

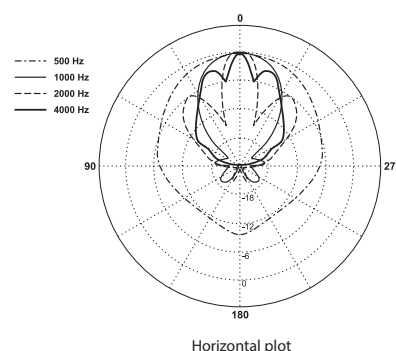


**TR15HF-EN**  
15 W

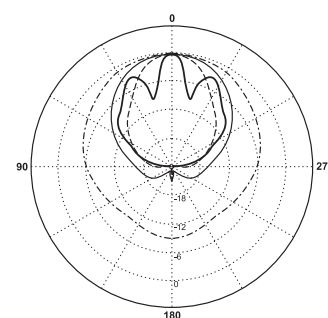
**TR15HF-EN** horn is a two-way speaker featuring a high level of efficiency, a wide frequency response range and excellent power-handling capacity.

The housing of the **TR15HF-EN** speaker unit is made of reinforced polypropylene, self-extinguishing according to UL94-V0.

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. It has a thermal cutoff and a flame-resistant cable according to UNI 9795 2010 (length: 80 cm).



Horizontal plot

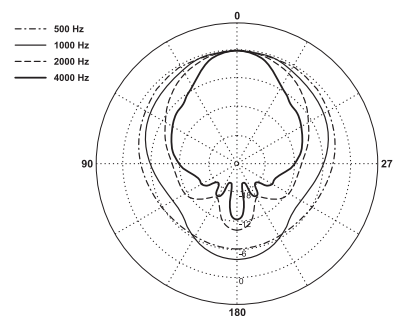




**C59/16-EN**  
16 W, Ø 185 mm

The **C59/16-EN** spherical speaker unit, featuring an excellent frequency response and ease of use, is suitable for harsh environments from the acoustic and plant-engineering points of view.

The **C59/16-EN** model was designed for suspended installation, thus meeting the needs of quality sound broadcasting even in large high-ceilinged areas. Elegant and discreet in appearance, it is made with a white ABS structure and has a constant-voltage line transformer with an adjustable output and a fitting for securing it to the ceiling. The cable enables a maximum extension of 4.5 m.



**EN54-24:2008 certification**  
C59/16-EN n. 1438-CPR-0514

MODEL	C59/16-EN
Rated power	16 W
Adjustable power	16 / 8 / 4 W
Characteristics	ABS UL94-HB
Sound pressure SPL Pnom/1m	102 dB
Efficiency 1W/1m	90 dB
Frequency response	130 ÷ 23.500 Hz
Dispersion angle @ 2 kHz	132°
Protection degree	IP 21C
Mounting	Hook for ceiling-mounting
Colour	White
Dimensions (Ø x D)	185 x 157 mm
Weight	1,58 kg





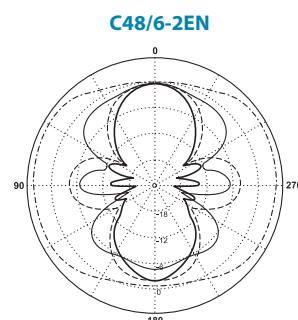
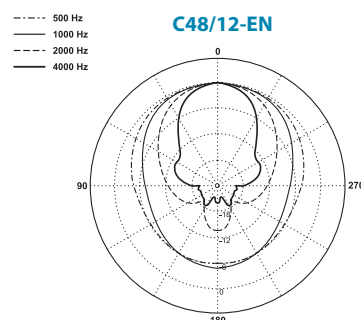
**C48/12-EN**  
12 W, Ø 140 mm



**C48/6-2EN**  
6+6 W, Ø 140 mm

Thanks to the use of excellent wide-band loudspeakers, the sound projectors of the **C48-EN** range are suitable for reproducing both music and speech, and can be used both indoors and outside.

Contained in a cylindrical structure made of 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. Each unit has its own thermal fuse that excludes the loudspeaker in the event of overheating plus a flame-proof connecting cable (length: 80 cm).



#### EN54-24:2008 certification

C48/12-EN n. 0068/CPR/033-2013

C48/6-2EN n. 0068/CPR/033-2013

MODEL	C48/12-EN	C48/6-2EN
Rated power	12 W	12 W (6+6W)
Adjustable power	12 / 6 / 3 W	12 / 6 / 3 W
Characteristics	ABS UL94-V0	ABS UL94-V0
Loudspeakers	1 broadband	2 broadband
Sound pressure SPL P <sub>nom</sub> /1m	101 dB	99 dB
Efficiency 1W/1m	90 dB	88 dB
Frequency response	170 ÷ 13.000 Hz	170 ÷ 14.000 Hz
Dispersion angle @ 2 kHz	100°	120°
Protection degree	IP 44	IP 44
Mounting	Swivelling bracket	Swivelling bracket
Colour	White	White
Dimensions (Ø x D)	140 x 207 mm	140 x 207 mm
Weight	1,7 kg	2 kg

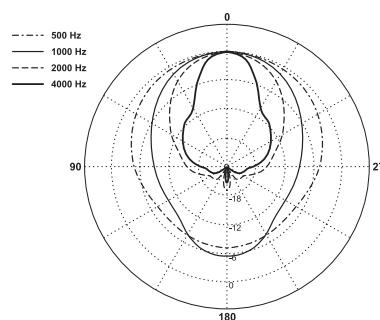


**C55/40-EN**  
40 W, Ø 200 mm

The **C55/40-EN** projector is characterised by excellent reproduction of both music and speech, and is suitable for outside installations.

This sound projector is made of UV-stabilised ABS and has a black chromium-plated stainless steel front grille. It has a ceramic terminal block, a thermal cutoff and a fire-proof cable according to **UNI 9795 2010** (length: 80 cm).

The swivelling mounting bracket running inside the guides on the side of the speaker make wall mounting and positioning easy.



**EN54-24:2008 certification**

C55/40-EN n. 0068/CPR/039-2016

MODEL	C55/40-EN
Rated power	40 W
Adjustable power	40 / 20 / 10 W
Characteristics	UV-stabilised ABS
Loudspeakers	1 broadband
Sound pressure SPL P <sub>nom</sub> /1m	104 dB
Efficiency 1W/1m	88 dB
Frequency response	100 ÷ 19.000 Hz
Dispersion angle @ 2 kHz	90°
Protection degree	IP 65
Mounting	Swivelling bracket
Colour	RAL7035 Light grey body, black grille and bracket
Dimensions (Ø x D)	200 x 220 mm
Weight	3 kg



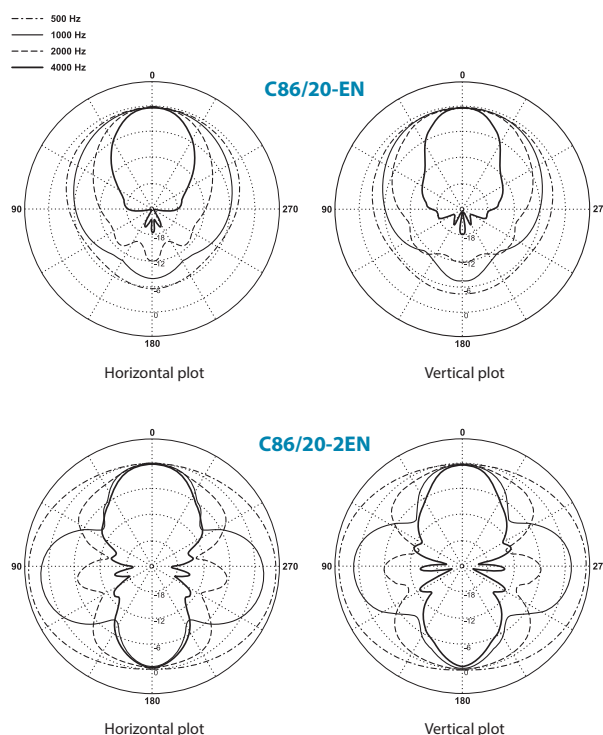
**C86/20-EN**  
20 W



**C86/20-2EN**  
10+10 W

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. The **C86/20-EN** unit is supplied with a swivelling fixing bracket that slides along the housing and a transformer for constant-voltage lines and equipped with a thermal cutoff and flame-proof cable (length: 80 cm), and they are available in unidirectional or bidirectional versions (**C86/20-EN** and **C86/20-2EN** respectively).



#### EN54-24:2008 certification

C86/20-EN n. 0068/CPR/033-2013

C86/20-2EN n. 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	Aluminium structure, stainless steel front grille	Aluminium structure, stainless steel front grille
Loudspeakers	1 broadband	2 broadband
Sound pressure SPL P <sub>nom</sub> /1m	105 dB	100 dB
Efficiency 1W/1m	92 dB	87 dB
Frequency response	150 ÷ 15.000 Hz	150 ÷ 15.000 Hz
Dispersion angle @ 2 kHz	100°	2 x 110°
Protection degree	IP 65	IP 65
Mounting	Swivelling bracket	Fixed bracket
Colour	Light grey body, black grille	Light grey body, black 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



**C57/6-EN**  
6 W, Ø 180 mm

**C58/12-EN**  
12 W, Ø 220 mm



**C573/6-EN**  
6 W, Ø 181,5 mm

**C57/6-EN** and **C58/12-EN** units for installing in false ceilings ensure an excellent reproduction of both speech and music.

Made of moulded sheet metal treated with white scratchproof and non-reflecting paint, they 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. 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.

Thanks to their flat design and limited depth, **C573/6-EN** units for ceiling mounting are suitable for installation in false ceilings, where very little room is available.

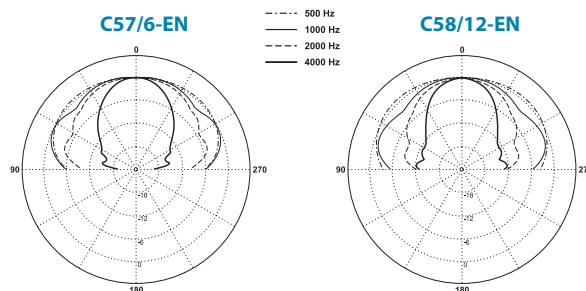
Each of them is equipped with a ceramic terminal block, a thermal cutoff and a special PET plastic cap for protection that can be replaced with an optional metal one (**AC973**).



EN54-24:2008 certification

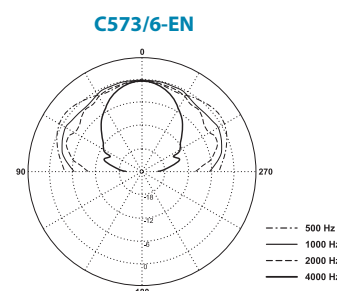
C57/6-EN n. 0068/CPR/033-2013

C58/12-EN n. 0068/CPR/033-2013



EN54-24:2008 certification

C573/6-EN n. 1438-CPR-0582



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





**C96/15-EN**  
15 W, white



**C96/15N-EN**  
15 W, black



**C96/30-EN**  
30 W, white



**C96/30N-EN**  
30 W, black

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.

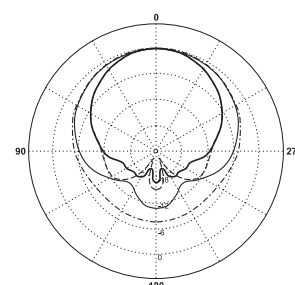
They are available in two colours (black or white).



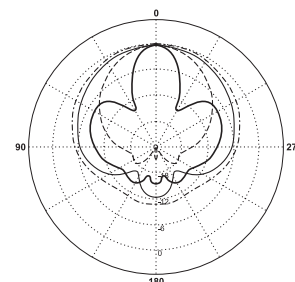
EN54-24:2008 certification  
C96-EN range n. 1438-CPR-0581

--- 500 Hz  
— 1000 Hz  
--- 2000 Hz  
— 4000 Hz

**C96/15-EN - C96/15N-EN**



**C96/30-EN - C96/30N-EN**

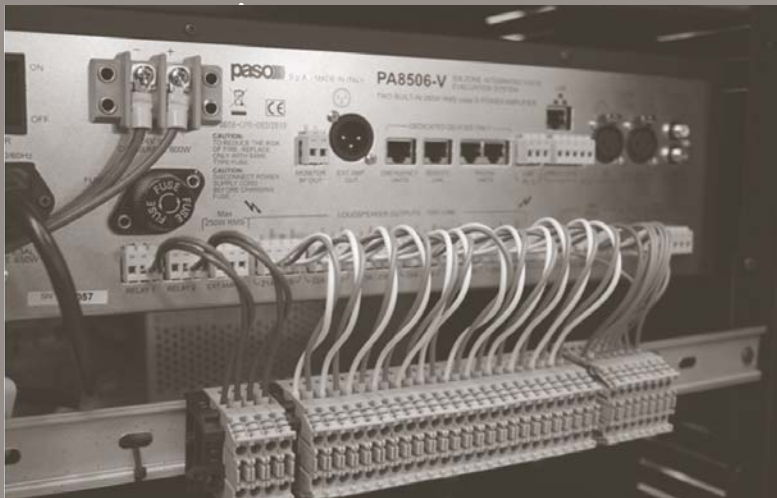


MODEL	C96/15-EN	C96/15N-EN	C96/30-EN	C96/30N-EN
Rated power	15 W	15 W	30 W	30 W
Adjustable power	15 / 7,5 / 3,75 / 1,8 W / 8 Ω	15 / 7,5 / 3,75 / 1,8 W / 8 Ω	30 / 15 / 7,5 / 2,5 W / 8 Ω	30 / 15 / 7,5 / 2,5 W / 8 Ω
Characteristics	UV-resistant shock-proof ABS	UV-resistant shock-proof ABS	UV-resistant shock-proof ABS	UV-resistant shock-proof ABS
Sound pressure SPL Pnom/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	White	White	White
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

PASO is one of the few companies in the business able 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.

The rack containers have been designed specifically for housing all PASO electronic equipment and service panels with provisions for modular fixing in 19" racks.

The crown jewel of the company is the supply of its central racks "ready for installation". They are fully cabled by specialised technicians and configured on the basis of the specific functions required for the system. Each of these racks is supplied complete with the diagrams, documentation and EC certification covering the products mounted on it.





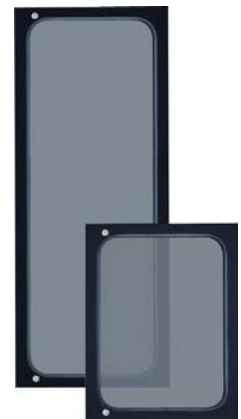
The PASO racks comply with IEC 297-2 and CEI EN 60065 standards. Also, as called for in the general safety regulations for electrical systems (CEI 64-8, CEI 64-11, CEI 23-48), both the racks and the various different accessories (doors, closing panels, etc.) are equipped with the appropriate terminals 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									






## SUMMARY TABLES

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MODEL		DESCRIPTION	Page
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	PA8506-V	2-channels integrated system (PA8500-VES system )	24
	PAW3502-V	"Light" all-in-one compact system for wall mounting - 500W / 2 zones	13
	PAW4502-V	All-in-one compact system for wall mounting - 500W / 2 zones	
	PAW4504-V	All-in-one compact system for wall mounting - 500W / 4 zones	
	PAW4506-V	All-in-one compact system for wall mounting - 500W / 6 zones	
	PAW5502-V	All-in-one compact system for wall mounting - 500W / 2 zones	9
	PAW5504-V	All-in-one compact system for wall mounting - 500W / 4 zones	
	PAW5506-V	All-in-one compact system for wall mounting - 500W / 6 zones	
	PAW51K4-V	All-in-one compact system for wall mounting - 1000W / 4 zones	
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	PMB112-EG	12-zone keys extension	
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	W-MS24/40	24 VDC / 40 A battery charger unit   Maximum charge current: 6 A	33
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MODEL	DESCRIPTION		Page
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	C37/6-EN	Speaker for wall/ceiling mounting, 6 W, colour: white	40
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	C48/6-2EN	Bi-directional sound projector, 6+6 W, colour: white	45
	C48/12-EN	Sound projector, 12 W, colour: white	
	C55/40-EN	Sound projector, 40 W, colour: light grey body, black bracket	46
	C57/6-EN	Metal unit for ceiling mounting, 6 W, Ø 180 mm, flame-proof cap, colour: white	48
	C58/12-EN	Metal unit for ceiling mounting, 12 W, Ø 220 mm, flame-proof cap, colour: white	
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	C86/20-2EN	Vandal-proof sound projector, 10+10 W, bi-directional, colour: light grey/black	
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	C1100-EN	Wall-mounting speaker unit, 100 W, IP55, colour: black	
	C1200-EN	Wall-mounting speaker unit, 200 W, IP55, colour: black	
	C6060-EN	Sound column, 60 W, IP55, H = 368 mm, colour: white	36
	C6060N-EN	Sound column, 60 W, IP55, H = 368 mm, colour: black	
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MODEL	DESCRIPTION	Page
Speaker units certified for conformity with EN 54-24		
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<b>ACPAW-6IN</b>	Optional 6-input card for PAW5500-VES / PAW51K-VES series	
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<b>M132-V</b>	Handheld dynamic microphone for PMB132 and TSB8500-V series emergency stations	
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Accessories for speaker units		
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<b>AC6103</b>	Swivelling vertical support for C6000-EN range sound columns, colour: white Also available in black colour (AC6103-N model)	
<b>AC6104</b>	Swivelling horizontal support for C6000-EN range sound columns, colour: white Also available in black colour (AC6104-N model)	
<b>AC7200</b>	Swivelling wall-mounting fitting for the C7200-EN sound column	35
<b>S4-B</b>	Swivelling wall-mounting fitting for C400-EN range sound columns	37



A background image showing architectural blueprints spread out on a table. Two hands are visible: one holding a pencil and pointing at a specific area on the plan, and another hand resting on the paper. The blueprints include various floor plans with labels such as 'LOBB', 'OFFICE', 'CLASS', and 'MENS'. There is also a circular diagram with numbers, possibly a scale or a clock face. The entire image has a light green tint.

# APPENDIX

General information on  
Voice Evacuation Systems

In addition to background music and sending service messages, a sound broadcasting system can also prove useful in less pleasant or common situations; in spaces with a large public presence, it is essential to have in place an adequate sound broadcasting system that is capable of managing emergency situations, allowing for a guided and controlled evacuation of the building.

**The purpose of a sound broadcasting system for voice evacuation is to transmit clear and audible information (any voice announcement or audio signal) in order to facilitate, in case of an emergency, a quick and orderly evacuation of the people occupying one or more areas inside or outside a building.**

Sirens, audible alarms and bells do not clearly communicate the nature of the emergency; especially in unknown environments, a voice message is the most effective way to inform and guide people.

The function of broadcasting alarms in the event of danger is essential in order to protect the lives of the occupants who, when properly warned, can promptly start evacuating, or to allow the staff, who have been specifically trained for such situations, to intervene and try to put out a burgeoning fire or, in the case of complex structures with many occupants, to assist in safely guiding people out of the building.

The ideal design of an evacuation system should ensure that all occupants of a building are able to reach a safe place as set out in the emergency management plan (*assembly point*).

It is clear that putting standards and regulations in place is essential to ensuring a certain level of quality and safety in what could literally be a matter of life or death. For this reason, "self-certifications" and/or declarations of conformity by the manufacturer are not permitted.

## REFERENCE STANDARDS

The following is a list of the legislative standards that specifically define the characteristics of an electroacoustic evacuation and emergency system, in terms of design and installation, so that it can meet the established requirements in terms of safety and reliability.

**UNI 9795:2013** | *Automatic fire detection and fire alarm systems - Design, installation and operation.*

**UNI ISO 7240-19:2010** | *Fire detection and alarm systems - Part 19: Design, installation, commissioning and service of sound systems for emergency purposes.*

**UNI EN 54-16:2008** | *Fire detection and fire alarm systems - Part 16: Voice alarm control and indicating equipment.*

**UNI EN 54-24:2008** | *Fire detection and fire alarm systems - Part 24: Components of voice alarm systems - Loudspeakers.*

**UNI EN 54-4:2007** | *Fire detection and fire alarm systems - Part 4: Power supply equipment.*

**UNI CEN/TS 54-32:2015** | *Fire detection and fire alarm systems - Part 32: Planning, design, installation, commissioning, use and maintenance of voice alarm systems.*

**CEI EN 50849 (CEI 79-102)** | *Sound systems for emergency purposes.*

The final objective should be to combine in a single standard (**EN 54-32**) both the EVAC systems used in case of fire and the general emergency systems (terrorist alarm, earthquake/ weather warning or any other dangerous situation that requires the evacuation of the building and that is not a fire). In this way, the current UNI ISO 7240-19 and CEI EN 50849 standards can be withdrawn, finally allowing for a single standard that can regulate the entire sector.

**In summary, the following scenarios are possible for the design of a sound broadcasting system for voice evacuation:**

- **system for voice evacuation in case of fire:** the reference standard for the design of the system is UNI ISO 7240-19, with the additional support of UNI CEN/TS 54-32 technical specification; the components must comply with the requirements of the product standards (EN 54-16 devices, EN 54-24 speakers, EN 54-4 secondary power supply) and have a CPR certification.
- **system for voice evacuation in case of generic danger (not fire):** the reference standard for the design of the system is CEI EN 50849.

**Technical standards are not mandatory but become binding in all applications which are subject to the legislative and/or regulatory provisions that require the use of a sound broadcasting system for both emergencies and voice alarms** (hospitals, schools, shopping centres, offices, theatres, sports centres, hotels and, more generally, any spaces that are not familiar to the occupants and that have a significant public presence).

## DESIGN OF THE EVAC SYSTEM

The design of a voice alarm system begins with the drafting of the system requirements and, depending on the intended use of the building, the number of people who can occupy it and the time required to evacuate it, an analysis must be carried out detailing the risks to the safety of people, property and daily activities following an emergency situation. The analysis of this information allows us to estimate the probability and severity of each risk in order to decide whether to prevent it, reduce its impact or possibly even accept it.

The emergency management plan and the risk assessment make it possible to determine a series of design proposals capable of reducing these risks in the event of an emergency situation arising:

- determine whether the EVAC system is the only alarm system, or whether it is supplemented by audible and optical warnings;
- determine the areas to be served by the EVAC system; whether it is necessary to cover the entire building or only a part of it, for example the part that is open to the public, or only the areas manned by operators (for example in a hospital, where it is useless to warn patients who require assistance in order to evacuate);
- define whether the system provides for a general evacuation or whether it should be divided into several

**emergency zones (EVAC zones);** in very large buildings, the emergency plan may require separate messages to be sent to different parts of the same building, or for the same message to be sent at different times. The part of the building where a message is sent constitutes an emergency area of the EVAC system. In this case, the relationship between the fire detection system zones and the EVAC zones becomes important. According to the standard, a given zone of the fire detection system should not contain more than one EVAC zone, but an EVAC zone may contain more than one zone of the fire detection system;

- identify the boundaries of the voice alarm zones. It is important for the intelligibility of a message in an EVAC zone not to be compromised by a simultaneous message from a different, neighbouring EVAC zone;
- the content and language to be used for pre-recorded messages;
- whether the warning message should be clear or encoded (using pre-established tones to avoid generating situations of mass panic), or whether both are necessary;
- whether alternative methods of warning should be considered for any areas not served by the voice alarm system because, for example, they are sparsely populated;
- additional or alternative methods of warning for the deaf and hard of hearing;
- additional or alternative methods of warning for areas with high environmental noise;
- whether it is necessary to manage an evacuation in several stages, with the ability to broadcast messages selectively or simultaneously in different parts of the building;
- determine if one or more emergency microphones are required.

With the same information, it is also possible to determine the level of safety (reliability) to be expected for the operation of the voice alarm system at the first fault:

- how many redundant amplifiers and/or back-up amplifiers with automatic integration are required;
- whether it is necessary to install protected connection lines for the equipment and speakers, made with higher-performance fire-resistant cable, and/or redundancy lines run along alternative routes;
- whether two or more speaker lines (redundant A/B cabling) are required to cover the same area;
- whether the speakers need to have loop connection with or without short-circuit protection devices (isolators).

Based on the evacuation strategy, the risk analysis and the level of expertise of the staff, the **UNI ISO 7240-19** standard provides for **four categories of EVAC systems**.

The categories highlight the level of manual control required based on the risk level and the presence of qualified staff who are capable of operating the system. It is important to note that safety does not increase in step with the category number: a category 4 system is not necessarily more effective or safer than a Category 1 system if the manual controls are used inappropriately and by untrained staff.

### Category 1

The EVAC system must operate automatically and be programmed to operate in accordance with the established rules for evacuation. The evacuation messages are pre-recorded and are transmitted only by commands from the fire alarm control panel.

### Category 2

In addition to sending automatic messages, the system offers the option of generally broadcasting (on all the speakers of the EVAC system) live voice messages through one or more microphone stations.

### Category 3

In addition to the characteristics of the above categories, there is also the option of transmitting live voice messages via one or more microphone stations to certain emergency zones or groups thereof; when automatic management may not prove to be appropriate in all circumstances, a category 3 system allows an operator to have control of the evacuation, intervening in certain emergency zones only.

### Category 4

In addition to the features of the previous categories, a category 4 system offers the option of selecting pre-recorded emergency messages and broadcasting them to specific emergency zones or groups thereof. The operator has the option of managing the emergency messages that are automatically played from the fire alarm control panel, as well as viewing their status in real time. This category requires the presence of qualified and trained staff who will have full access to the system, enabling them to deal with even complex evacuation situations.

Considering that the **messages transmitted by an EVAC system must not be not only audible, but also intelligible** (i.e. understandable to the recipient), it is necessary to carry out an acoustic analysis that can minimise the shadow zones (areas in which there is an insufficient level of direct acoustic pressure, associated with a lack of intelligibility); this can occur due to the use of an insufficient number of speakers or their imperfect positioning.

As far as sound pressure is concerned, the standard requires that in all locations where alarm signals are transmitted, **the sound pressure level must be at least 10 dB higher than the ambient noise level, over a period of 60s, and must not be lower than 65 dBA or higher than 105 dBA where the listeners are located**. Acoustic alarm signals intended to wake sleeping occupants must have a minimum sound pressure level of 75 dBA at the head of the bed (behind closed doors).

The standard also defines the reasonable minimum requirements for speech intelligibility. The two parameters that most affect speech intelligibility are **ambient noise** and **reverberation time** (the time it takes for the sound to decrease by 60 dB after the source of the sound has stopped emitting it). The most precise method currently available to assess the intelligibility of a message is the STI (*Speech Transmission Index*), which measures the transmission index of speech by measuring the modulation transfer function (MTF) using a test signal with level and directivity characteristics similar



to those of the human voice (the frequencies of speech are between 125Hz and 8,000Hz). The acoustic characteristics of the environment and the background noise determine the reduction of the test signal's MTF, from its emission to its reception. The STI essentially indicates how much the signal degrades due to reflections and background noise.

When it is necessary to assess speech intelligibility in reverberant or noisy environments, a new variant of the method, known as the **STIPA** (*Speech Transmission Index Public Address*), is the most suitable means of measurement.

The values returned by the STI or STIPA method are between **0** (no intelligibility whatsoever) and **1** (total intelligibility).

**The average value required by the standard is STI/STIPA = 0.5 (with 0.45 being the minimum acceptable level).**

However, the **UNI ISO 7240-19** system standard (a prescriptive method) states that, in acoustically 'simple' areas (offices, hotel rooms, hospital corridors, etc.) where **the average reverberation time is no higher than 1.3s and the reference ambient noise level is less than 65 dBA**, it is sufficient for voice messages to have a **sound pressure level over 75 dBA** (measured over a period of at least 10s) and to position the loudspeakers in accordance with the following rules:

- the distance between the intervals must be  $\leq 6$  m for **one-way loudspeakers** and  $\leq 12$  m for **two-way loudspeakers**;
- the obstacle-free distance between any loudspeaker and each listener must be  $\leq 6$  m for **one-way speakers** and  $\leq 7,5$  m for **two-way speakers**.

When calculating the distance between the loudspeakers and the listeners, you should account for the listener **being 1.2m off the ground (if seated) or 1.6m off the ground (if standing)**.

In conclusion, a careful design must necessarily make use of computer-generated acoustic simulations for the most critical and difficult situations, so as to provide an opportunity to assess the final result of the installation in advance, thus preventing the creation of areas with insufficient sound pressure and intelligibility.

## KEY FEATURES OF EVAC SYSTEMS

The main components of a sound broadcasting system for voice evacuation may be summarised as follows:

- **the control unit** (generally consisting of a cabinet in which all the components intended to generate alarm messages and monitor the functionality of the system are installed);
- **one or more control microphone stations** from which it is possible to send voice messages, in general and/or to selected zones, and to activate or deactivate the pre-recorded messages;
- **the loudspeakers** installed in the emergency zones;
- **the connection lines for the speakers.**

It should be borne in mind that the EVAC system must always remain available throughout the emergency situation, unless it is damaged as a result of the incident that caused the state of alarm. Furthermore, it can also be used not just

to broadcast alert messages, but also for communications under normal conditions (e.g. service announcements or background music); obviously, as soon as the alarm is raised for any reason, the system must immediately disable any function that is not connected to the emergency situation.

### Central control unit

**The central control unit** includes all playback, recording, mixing and amplification equipment, as well as the automatic priority management and diagnostic systems that are necessary for the proper functioning and monitoring required by the design specifications of the system. The cabinet containing the various pieces of equipment must be robustly constructed, equipped with the appropriate terminals for proper earthing and must have a protection rating of at least IP30.

All control and alerting equipment for the voice alarm system must comply with the **EN 60065 (CEI 92-1, Audio, video and similar electronic equipment - Safety requirements)** and **UNI EN 54-16** standards.

To briefly summarise, in order for the control centre for a voice evacuation system to comply with the relevant standards, it must meet the following requirements:

- **control of the critical path**, i.e. the path of the audio signal from the emergency microphone capsule and/or message generator to the loudspeaker line through the amplification chain: any fault in this path must be suitably reported;
- **secondary power supply**: in case of mains power supply failure, the system must be able to operate, under voice alarm conditions, for at least twice the evacuation time specified in the emergency management plan and in any case for **no less than 30 minutes**. If the emergency management plan does not provide for the evacuation of the building after a power failure, the system must be able to remain in **standby mode for at least 24 hours**, and then be able to operate in voice alarm mode for **at least 30 minutes**. As such, a continuous secondary power supply must be provided, along with a battery recharging unit, designed so as to guarantee the required battery life according to the power consumption of the system. Power supplies for voice alarm systems must comply with the **UNI EN 54-4** standard;
- **functional control of the power amplifiers** and, if the design includes backup amplifiers, in addition to their functional control, the central unit must also be able to manage their automatic activation in the event of the failure of the main amplifiers;
- **control of the loudspeaker lines**: the load and integrity of the speaker lines must be continuously checked, reporting any anomalies relating to short circuits, interruptions in the line and/or earth leakage;
- **pre-recorded messages on non-volatile media**: preferably a solid-state memory that cannot be altered or damaged by an external source and that is continuously monitored to ensure its integrity;
- **control of the connection with the fire alarm control station**: the connection is usually made through logical

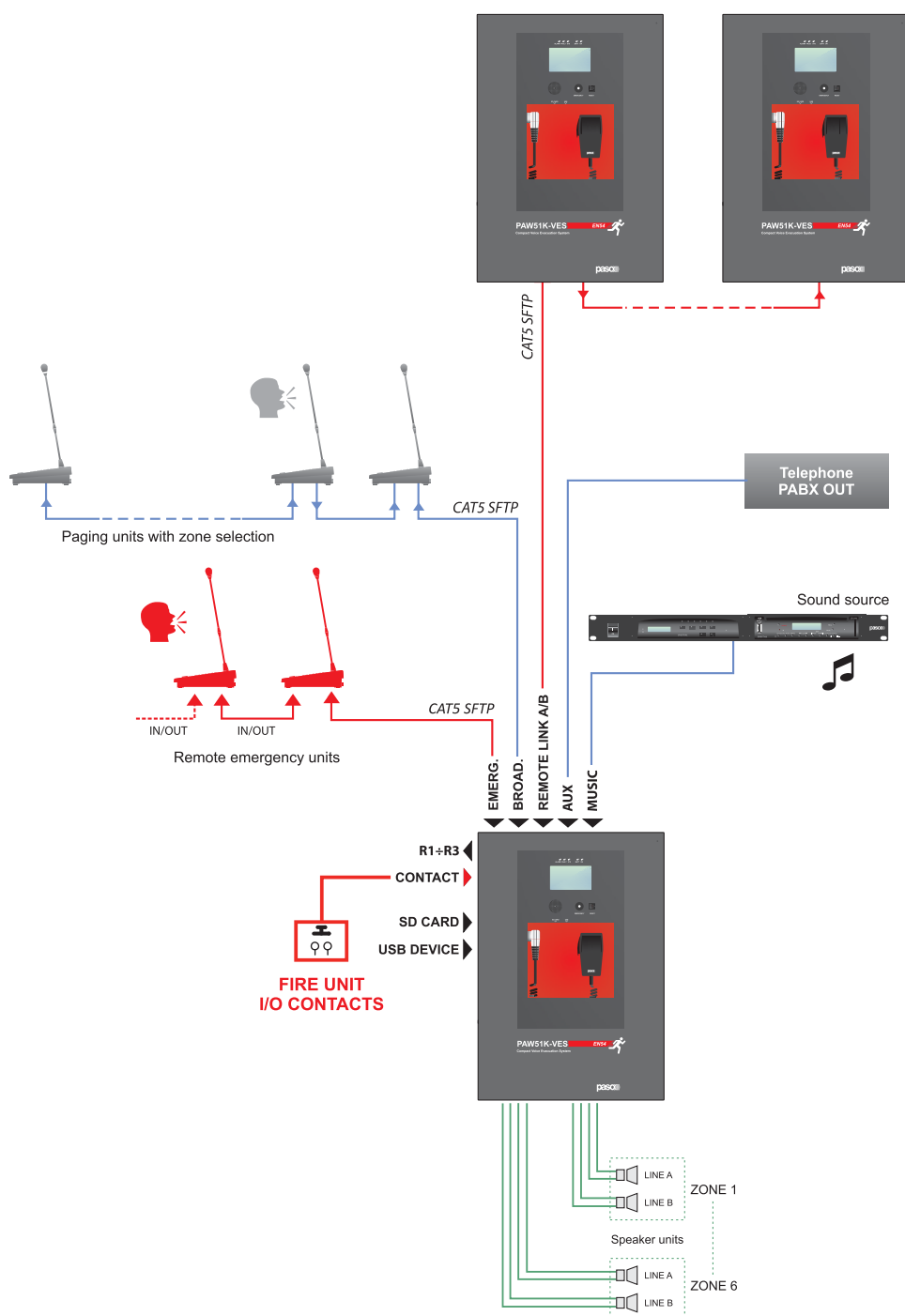


contacts that can be monitored. Once it has been activated by the fire detection system, the EVAC system must continue to broadcast alarm messages even if the connection between the two systems fails due to a fault;

- **reporting of the operating status and any faults:** the central unit must constantly monitor the proper functioning of all the equipment, and any faults or the operation of a protective device that could prevent an emergency communication must activate a dedicated light and sound signal. The fire alarm control station must display, as a minimum, the general operating status of the EVAC system (i.e. whether or not there are any faults);
- **control of the management software:** the running of the software by the microprocessors that manage the system must be subject to a continuous monitoring process.

Any execution errors will result in the microprocessor resetting and the program restarting within 10 seconds.

- **operation times:** the system must be able to operate within **10 seconds** of receiving a power supply, must report any faults within **100 seconds**, and must be capable of transmitting the emergency message, be it activated manually or by the fire detection system, within **3 seconds**;
- **access levels:** the system must provide at least **4 access levels**; one generic access for an initial emergency response, one for people with specific responsibility for emergencies, one for authorised and competent staff who are able to reconfigure the system, and finally one for repairs and/or hardware modifications and/or firmware updates of the various pieces of equipment.



Principle diagram of a typical sound broadcasting system for voice evacuation.

The **PAW Series** of compact voice evacuation systems, which are compliant with the **UNI EN 54-16** and **UNI EN 54-4** standards, have been specifically designed for wall mounting and come complete with all the necessary equipment (including the battery charger unit).

These control units are the most suitable for use in small- to medium-sized installations; in any case, EVAC systems are, to all intents and purposes, considered active protection systems, and it is possible to ensure that their design is appropriate for the business to be protected by using certified components which are as qualified as possible for the management and broadcasting of emergency messages.



Compact EVAC control unit  
**PAW51K-VES Series**

### Microphone stations for emergencies

The design of an EVAC system may include several remote microphone stations (**emergency microphones**) designated for the use by competent members of staff during an emergency situation. These microphone stations allow for live voice messages to be broadcasted with a higher priority than pre-recorded messages; they are fully diagnosed (including the microphone capsule) and any faults that may occur with them are reported by the central unit. From the front panel, it is possible to view reports of all the main information regarding the emergency status of the system and any system faults.



EVAC microphone stations  
**PMB132 Series**

According to the emergency management plan, there are normally two types of microphone stations used:

- **stations with limited functions:** these only have the ability to broadcast live voice messages in general (across all EVAC zones) and/or to select the pre-recorded emergency messages and send them (again, only in general). These microphones are usually intended for emergency staff who do not know the building well and are there to manage a general evacuation of the whole building;
- **stations with all features:** these can broadcast live voice messages in general and, if necessary, to certain emergency zones or groups thereof; it is possible to select pre-recorded emergency messages and broadcast them simultaneously to different emergency zones or groups thereof. Through these stations, the operators can manage the emergency messages that are automatically activated by the fire alarm control station, and they have full access to the system, allowing them to deal with even more complex evacuation scenarios.

Emergency microphone stations are normally located in a control room and are used by competent and trained staff.



Microphone station with locker

If the design of the building provides for emergency microphone stations being located in particular areas of the building which are unmanned by staff, they are installed in closed lockers which are only accessible to emergency staff.

In any case, as regards the location of emergency stations, it is important to bear in mind that the ambient noise level near the microphone must not exceed **70 dBA** (as per the **UNI ISO 7240-19** standard).

Any assessment of the level of ambient noise must be made taking into account the unusual circumstances of an emergency.

### Loudspeakers

Unless otherwise regulated or exempted due to particular constraints and/or acoustic and/or installation requirements, under the **UNI ISO 7240-19** standard, the loudspeakers of an EVAC system must be **UNI EN 54-24** certified. The standard sets out the minimum acoustic performance, together with the construction and environmental requirements for voice alarm loudspeakers to be suitable for use in fire detection and fire alarm systems. The technical characteristics and positioning of the loudspeakers that are part of a voice alarm system are very important; they must comply with the

design specifications in order to ensure the broadcasting of intelligible warnings to anyone occupying or in the vicinity of a building in which an emergency situation has arisen due to a fire, thus making such people aware of the dangerous situation and allowing them to proceed in accordance with the predetermined evacuation plan.

Depending on the type of environmental application, EVAC speakers can be classified as follows:

- type A speakers (mechanical enclosure protection degree IP21C) for indoor use;
- type B speakers (mechanical enclosure protection degree IP33C) for outdoor use.

**The proper functioning and performance of EVAC speakers must be guaranteed even after a fire is detected;** as such, in addition to being made from materials capable of withstanding the tests specified by the **UNI EN 54-24** standard, speakers with a plastic casing must also comply with the following ignitability standards:

- **Class V2**, according to the **CEI EN 60695-11-10** standard, if the device operates at a voltage  $\leq 30$  V RMS or 42,4 V DC or 42,4V DC and with an absorption of  $< 15$  W;
- **Class 5VB**, according to the **CEI EN 60695-11-20** standard, if the device operates at a voltage  $\geq 30$  V RMS or 42,4 V DC and with an absorption of  $> 15$  W.



*Metal projector*  
**C86/20-EN**



*Plastic projector*  
**C48/12-EN**

If the speaker does not come with an external cable for connection to the main line, it must be equipped with internal terminals which are firmly fastened and able to hold cables of a diameter between 0,8 and 2,5 mm<sup>2</sup>.



*Ceiling speaker with plastic cap*  
**C573/6-EN**



*If required by the design, the ceiling speakers can be fitted with a metal protective cap*  
**C57/6-EN**

It is important to ensure that, when sending messages to different zones at the same time, loudspeakers located in neighbouring EVAC zones do not interact negatively with each other, compromising the understanding of the messages themselves. **Special attention should also be paid to any loudspeakers installed near the emergency microphones and their power setting, so that no audible feedback is caused when the microphone itself is used.**

### Connection lines for the speakers

The **UNI 9795** standard for the connection of the speakers requires the use of fire-resistant cables tested for compliance with the **CEI EN 50200** standard (minimum requirement PH 30) with a rated voltage of 100V ( $U_0/U = 100/100V$ ) and manufactured according to **CEI 20-105**.

The cables must be **flexible conductors** (no rigid conductors are allowed), with a **minimum diameter of 0,5 mm<sup>2</sup>**.

It should be noted that cables conforming to the **CEI 20-105** standard are suitable for laying in coexistence with power cables used for systems with a rated voltage to earth of **up to 400V**.

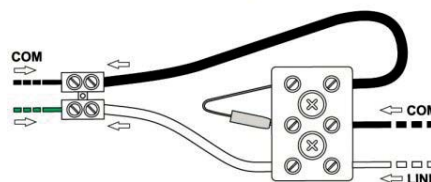
In the case of voice evacuation systems, with lines of a rated voltage of approx. 70V ac or 100V RMS, in order to facilitate the distinction between the lines of the smoke detection system and the lines of the voice evacuation system, low-power cables which are fire-resistant and fire-retardant with **purple sleeving** should be used.



The connection lines for the speakers must be designed and laid in such a way that a fault in one line does not affect the operation of other lines.

In order to make the installation compliant with voice alarm standards, where it is required that in case of fire the entire loudspeaker circuit must not be compromised by one or more loudspeakers being damaged by the flames, the various loudspeakers must be installed with special connection adaptors to be placed in series with the line itself.

**The connection kit** usually comprises a 3-pole ceramic screw terminal strip with a pre-assembled thermal fuse. The ceramic terminal strip is able to withstand temperatures of over 650° C, whilst the thermal fuse (about 150° C), when connected in series, isolates the speaker from the main line in case of fire.

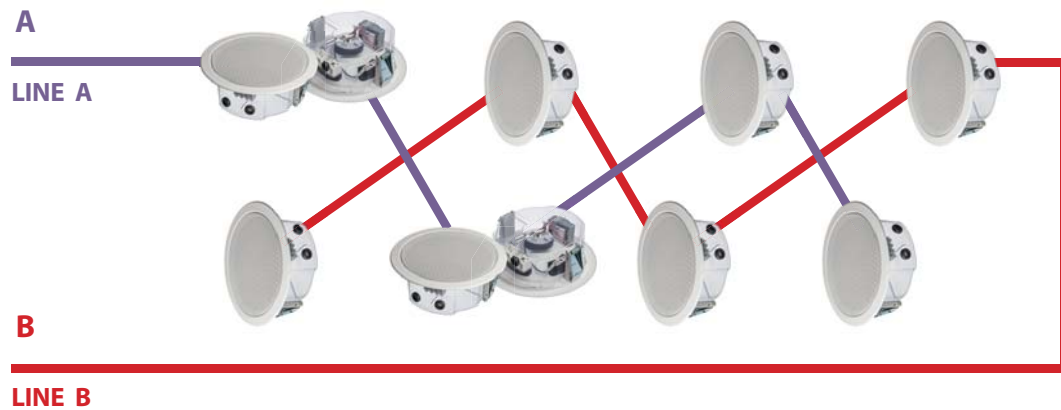


*Example of ceramic terminal strip for EVAC systems*  
**AC950**

If the results of a risk analysis suggest that an EVAC zone should be served by two or more loudspeaker lines, the speakers must be positioned and wired in such a way that a fault in one line does not compromise the recommended level of intelligibility for that area.

Every single emergency broadcasting area must have a redundancy built in by laying two lines for each zone and alternating the speakers in the room. The lines must be laid on two separate cable ducts.

The choice of redundant cabling (known as A/B cabling) is the safest choice against a short circuit in the line. The alternative of loop connection reduces the risk of the line being cut, but protection devices (isolators) must be put in place to ensure that the entire loop does not become unusable in the event of a short circuit.



*Example of redundant A/B cabling with separate main line cable paths and speakers connected in a 'quincunx' pattern*

## INSTALLATION AND MAINTENANCE

The installation of a voice alarm system for emergency purposes must be carried out in full compliance with the design and by people with the appropriate qualifications and in possession of installation qualifications as per Italian **Ministerial Decree 37/08 (DM 37/08)**.

When the work is complete, the installation company must provide the manager of the business with the declaration of conformity in accordance with the best working standards as required by Italian **DM 37/08**, as well as the final documentation necessary for the user and/or maintenance technician of the system (design documents, instruction manuals for the equipment, installation diagrams, maintenance times and methods for specific components, results of the tests and measurements carried out in the system, including the intelligibility values for each EVAC zone, etc.).

As with all safety systems, the EVAC system operator must appoint a qualified person to ensure that the system is properly maintained. The **UNI ISO 7240-19** standard requires **maintenance to be carried out twice a year and at intervals of no longer than 6 months**.

In addition, every 12 months the efficiency of the system must be checked and it must be ensured that the requirements for speech intelligibility in each emergency zone are met.

The end user and/or maintenance technician of the system must keep records of its commissioning and a log of all regular and unscheduled maintenance; these records must show all the values measured (component settings, load of each loudspeaker line, operating settings, power amplifier output levels, average sound pressure levels and intelligibility measurements for each loudspeaker zone, etc.) as well as any faults or anomalies which have occurred. These records must be kept available for inspection by the relevant authorities.







## EVAC catalogue



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