PA TECHNOLOGY

Technology for an Excellent Sound

MONACOR®

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2014

CATALOGUE 143

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valid from March 2014

Contents

PRODUCTS

KNOW-HOW

Technology for an Excellent Sound

MONACOR®

Audio Management Controller with EN 54

EVA-16MEN

482 mm 19" EN 54

Order No. 17.3970

Audio management controller (master), with EN 54-16 certification for voice alarm systems (VAS) according to DIN EN 60849 (VDE 0828) and DIN VDE 0833-4. As the central controller, EVA-16MEN is used for managing and monitoring microphone announcements, emergency announcements and stored evacuation announcements, any required music feeds and for the secure reproduction of chimes and sirens. Furthermore, the EVA-16MEN is also monitoring power amplifiers connected as well as a possible emergency power supply. Connected speaker lines are also monitored for interruption, impedance deviations as well as for short-circuit and fault to earth.
This unit can be used as a master for individual projects and in master/slave (EVA-16MEN + EVA-16SEN) for more complex projects, can be cascaded to up to 10 systems.

- Monitoring of the amplifiers with emergency switching (8 amplifiers and 1 spare amplifier)
- Monitoring of up to 8 speaker lines in A/B cabling (16 testing circuits)
- 2 x fireman's microphone can be connected (MEVAC-1FT) at the rear panel or a hand-held microphone (MEVAC-1FH) directly at the front panel
- Up to 8 monitored system microphone stations EVA-16TER can be connected
- 4 audio inputs with free assignment/distribution of the audio input signals
- 2 additional audio inputs (AUX)
- 4 transformer-balanced AF outputs + 1 output for emergency amplifier with free assignment of the different music sources
- Digital voice memory for alarm announcements
- Tone control and volume control for each amplifier channel
- Easy programming via push-buttons and two-line display
- Extensive inputs and outputs for controlling and signalling
- RS-232 interface for programming or updating via a PC
- 482 mm (19") rack installation
- Power supply: 230 V~/50 Hz/25 VA or 24 V⎓/600 mA
- Dimensions: 483x88x248 mm (19", 2 RS)
- Weight: 6 kg
- Mains operation and 24 V emergency power operation

EN 60849 EN 54-16

EVA-16SEN

482 mm 19" EN 54

Order No. 17.4220

Audio management controller (slave), with EN 54-16 certification for voice alarm systems (VAS) according to DIN EN 60849 (VDE 0828) and DIN VDE 0833-4. As an extension of the controller EVA-16MEN, the EVA-16SEN is used for managing and monitoring microphone announcements, emergency announcements and stored evacuation announcements, any required music feeds and for the secure reproduction of chimes and sirens. Furthermore, the EVA-16SEN is also monitoring power amplifiers connected as well as a possible emergency power supply. Connected speaker lines are also monitored for interruption, impedance deviations as well as for short-circuit and fault to earth.
To be used as a slave unit for EVA-16MEN for more complex projects, can be cascaded to up to 10 systems.

- Monitoring of the amplifiers with emergency switching (8 amplifiers and 1 spare amplifier)
- Monitoring of up to 8 speaker lines in A/B cabling (16 testing circuits)
- 2 x fireman's microphone can be connected (MEVAC-1FT) at the rear panel of the unit or a hand-held microphone (MEVAC-1FH) directly at the front panel
- Up to 8 monitored system microphone stations EVA-16TER can be connected
- 4 audio inputs with free assignment/distribution of the audio input signals
- 2 additional audio inputs (AUX)
- 4 transformer-balanced AF outputs + 1 output for emergency amplifier with free assignment of the different music sources
- Digital voice memory for alarm announcements
- Tone control and volume control for each amplifier channel
- Easy programming via push-buttons and two-line display
- Extensive inputs and outputs for controlling and signalling
- RS-232 interface for programming or updating via a PC
- 482 mm (19") rack installation
- Power supply: 230 V~/50 Hz/25 VA or 24 V⎓/600 mA
- Dimensions: 483x88x248 mm (19", 2 RS)
- Weight: 6 kg
- Mains operation and 24 V emergency power operation

EN 60849 EN 54-16

EN 54 Accessories

EVA-16TER

Order No. 23.0020

System microphone station, according to DIN EN 60849 (VDE 0828) for announcements in up to 80 speaker circuits, to be selected as desired.

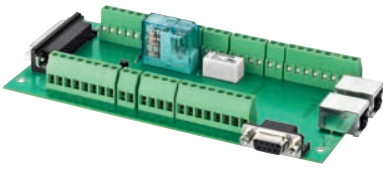
- Microprocessor-controlled system microphone station, especially for the connection to EN 54-16 certified controller EVA-16MEN
- For announcements in up to 80 speaker circuits, to be selected as desired
- Built-in two-line LCD for indicating the respective operating status
- Separate emergency button
- Individual programming of single, group, collective and emergency announcements with the respective priority level
- Concealed buttons for safety-related system functions
- Connection via RJ45 jack
- Dimensions: 350x75x210 mm
- Weight: 3.15 kg

EVA-16IO

Order No. 17.4210

EN 54

Connection PCB according to EN 54-16, for connecting the system microphone station EVA-16TER, for example, to the audio management system EVA-16MEN/SEN. The PCB is to be connected to the EVA-16 system via a 25-pole D-sub cable and a Cat. cable, both available at option. Additionally, it features a changeover contact which is activated in case a fault occurs. A further relay is activated in case of an emergency and during installation. It is also used to connect emergency priority relays of L-controls.



EVA-16FP

Order No. 17.0210

EN 54

PA fireman's microphone, for the audio management system EVA-16...
This fireman's microphone station has especially been developed according to the standards DIN EN 60849 (VDE 0828), EN 54-16 or DIN 14661. Thus, it allows emergency services to organise a safe and systematic evacuation of the people in case of an alarm.

- Supplied with hand-held PA microphone MEVAC-1FH
- 4 alarm zones
- 4 fireman's microphone stations
- Robust red sheet steel wall-mounted housing
- Relay fire alarm control panel (FACP): 24 V/2 kΩ
- Relay contact ERROR: 120 V~/2 A max.
- Power supply: 18-30 V⎓/60 mA
- Dimensions: 305x235x140 mm
- Weight: 4.5 kg

RACK-625/42

Order No. 17.0160

482 mm 19" EN 54

PA unit rack for 482 mm (19") units, 42 RS

- For the installation of voice alarm systems according to EN 54-16
- Bars adjustable in height in steps of 25 mm for using quick-mount cage nuts
- Flange plate, rear side flange opening in the integrated base with connection jacks for wall distribution
- Ventilation slots in the upper part
- Earthing bolt in each individual part of the case
- Earthing accessories
- Rear-ventilated sheet steel door (rear side of the rack) with cylinder lock
- Colour of body: black, height-adjustable bars: red
- Dimensions: 2,066x600x600 mm
- Weight: 105 kg

Supplied without units.

RACK-625/42ST

Order No. 17.0170

EN 54

Ventilated sheet steel door, for 19" PA unit rack RACK-625/42.

- For the front side of the rack
- Cylinder lock
- Colour: black
- Dimensions: 1,745x515 mm
- Weight: 8.2 kg

EN 54-16

Evacuation Controller

MEVAC-4

Order No. 17.2670

Evacuation controller, with EN 54-16 certification for voice alarm systems (VAS) according to DIN EN 60849 (VDE 0828) and DIN VDE 0833-4.
As a central controller, the MEVAC-4 can carry out numerous functions:

- Monitoring of the speaker lines
- Monitoring of the amplifiers with emergency switching (for 4 amplifiers and 1 spare amplifier)
- Digital voice storage for alarm announcements
- Monitoring of fireman's microphones
- Distributor for audio input signals like microphone and background music
- 4 independently addressable announcement circuits in A/B wiring
- Fault signalling via relay contacts

Additional features:

- Connection for any number of emergency announcement microphones (1-channel or 4-channel)
- Extensive inputs and outputs for monitoring and signalling
- Modern DSP technology, updatable
- Easy programming via push-buttons and built-in display
- Input for background music
- Aux input to be activated via external contact
- Tone control and volume control for each amplifier channel
- Background music is turned off automatically during 24 V operation
- Bass attenuation in case of an alarm
- RS-232 connection for programming and updating
- Power supply: 230 V~/50 Hz/20 VA or 24 V⎓/500 mA
- Dimensions: 482x44x315 mm (1 RS)
- Weight: 5 kg
- Mains operation and 24 V emergency power operation

MEVAC-4PTT

Order No. 23.5600

PA desktop microphone (push-to-talk), for the connection to evacuation controller MEVAC-4.

- 4 call zone push-buttons
- Push-button for all-call function
- Ready to call indication via LED
- Gooseneck with dynamic microphone cartridge
- 1.8 m connection cable with 9-pole D-sub plug

MEVAC-1PTT

Order No. 23.5570

PA desktop microphone (push-to-talk), for the connection to evacuation controller MEVAC-4.

- Programmable push-button for all-call function or individual zone
- Ready to call indication via LED
- Gooseneck with dynamic microphone cartridge
- 1.8 m connection cable with 9-pole D-sub plug

MEVAC-1FT

Order No. 23.5590

PA desktop microphone, for emergency announcements according to EN 60849.

- For the connection to evacuation controller MEVAC-4
- Monitored microphone cartridge and request line
- Push-to-talk button
- Gooseneck with dynamic mic. cartridge
- Red metal housing (fireman's microphone)
- 1.8 m connection cable with 5-pole DIN plug

MEVAC-1FH

Order No. 23.5580

Hand-held PA microphone, for emergency announcements according to EN 60849.

- For the connection to evacuation controller MEVAC-4
- Monitored microphone cartridge and request line
- Push-to-talk button
- Red plastic housing (fireman's microphone) with dynamic microphone cartridge and steel clip
- 1 m helix connection cable with 5-pole DIN plug

MEVAC-1CON

Order No. 17.2750

Connection outlet, for hand-held PA microphone MEVAC-1FH or PA desktop microphone MEVAC-1FT.

- 5-pole DIN jack
- Flush mounting in standard 60 mm wall sockets
- Surface mounting with supplied surface-mount housing
- Dimensions: 80x80x37 mm

MEVAC-2CON

Order No. 17.2760

Connection outlet, for PA desktop microphone (push-to-talk) MEVAC-1PTT or MEVAC-4PTT.

- 9-pole D-sub jack
- Flush mounting in standard 60 mm wall sockets
- Surface mounting with supplied surface-mount housing
- Dimensions: 80x80x37 mm

100 V Power Amplifiers

SINUS-220
Order No. 17.4370

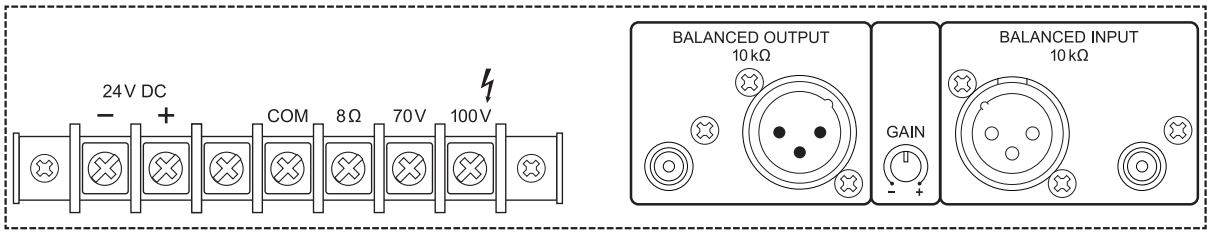
SINUS-20
Order No. 17.4240

SINUS-10
Order No. 17.4230

PA power amplifiers, for the application in professional PA systems and for setting up standardised voice alarm systems (VAS) according to EN 54-16 in combination with the audio management system EVA-16 from MONACOR.

- Temperature-controlled fan
- LED display for protect and signal
- Mains switch at the rear panel for preventing accidental switching off
- 24 V emergency power input
- Mains operation or 24 V emergency power operation
- 482 mm (19") rack installation with fitted mounting brackets

SINUS-220 = 2 x 240 W_{RMS}
SINUS-20 = 1 x 240 W_{RMS}
SINUS-10 = 1 x 120 W_{RMS}



Model	SINUS-220	SINUS-20	SINUS-10
Output power	2 x 240 W_{RMS}	1 x 240 W_{RMS}	1 x 120 W_{RMS}
Input sensitivity	1 V/10 kΩ, bal.	1 V/10 kΩ, bal.	1 V/10 kΩ, bal.
Output impedance	-	-	-
Frequency range	35-18,000 Hz, -3 dB	35-18,000 Hz, -3 dB	35-18,000 Hz, -3 dB
S/N ratio	> 86 dB	> 86 dB	> 86 dB
THD	< 1 %	< 1 %	< 1 %
High-pass filter	-	-	-
Admiss. ambient temp.	0-40 °C	0-40 °C	0-40 °C
Power supply	230 V~/50 Hz/1,280 W, 24 V⎓/30 A	230 V~/50 Hz/640 W, 24 V⎓/15 A	230 V~/50 Hz/320 W, 24 V⎓/7.5 A
Dimensions	425x88x450 mm, 2 RS	425x88x305 mm, 2 RS	425x88x305 mm, 2 RS
Weight	18 kg	10.5 kg	8.5 kg
Connections			
Signal input	XLR / screw terminals	XLR / screw terminals	XLR / screw terminals
Speaker output	screw terminals	screw terminals	screw terminals

Charging Controller, Rech. Battery, Emergency PSU

EVA-24/54

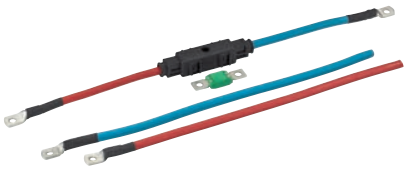
482 mm 19" EN 54

Order No. 17.4190

Certified charging controller for evacuation systems, for setting up a standardised emergency power supply according to EN 54-4.

- Suitable for PA components with 24 V connection
- Output voltage: 24 V⎓
- Output current: 6 x 40 A max., 3 x 5 A max., total output: 960 W max.
- Maximum charging current: 12 A
- Constant monitoring of all primary and secondary input voltages
- Permanent monitoring of the fuses
- Monitoring of the battery charging current
- Indication of the discharge status of the rechargeable batteries
- LED indication of every relevant operating status
- Floating contacts for retransmission of errors
- Admissible battery capacities: 65 Ah to 225 Ah (2 x 12 V⎓ each)
- Cable set EVA-24CON for connecting 2 x AKKU-12/120 is available at option
- Power supply: 230 V~/50 Hz/390 VA
- Dimensions: 325x170x220 mm
- Weight: 5.1 kg

Matching rechargeable lead batteries AKKU-12/120 (2x) are available at option.



EVA-24CON

Order No. 17.4200

Cable set, for connecting 2 rechargeable lead batteries AKKU-12/120 to the charging controller EVA-24/54.

AKKU-12/120

Order No. 17.4180

Rechargeable lead battery, 12 V, for charging controller EVA-24/54.

- Power rating: 12 V/120 Ah
- Gas-tight sealed, maintenance-free
- Dimensions: 32.5x17x22 cm
- Weight: 32 kg
- 2 rechargeable batteries AKKU-12/120 are required for an operation with EVA-24/54

PA-24ESP

482 mm 19"

Order No. 24.3120

24 V emergency PSU, for our PA components with 24 V connection.

- Installation of 2 x rechargeable lead battery NPA-12/24 possible
- Screw connection for external 24 V rechargeable batteries
- Maximum charging current: 2.5 A
- Electronic charging control with overload protection, protection against total discharge and trickle charge
- 1 x output 24 V⎓/1 A (unswitched)
- 2 x output 24 V⎓/32 A
- 3 x output 24 V⎓/16 A
- Power supply: 230V~/50Hz/110 VA
- Dimensions: 482x135x405 mm
- Weight: 11.7 kg

Complex Systems with EN 54-16 Certification

The requirements made on the standards of modern voice alarm systems are becoming increasingly complex. Thus, standardised systems can hardly be found anymore. Nowadays, these systems are mainly configured according to the requirements of the application and the structural conditions. The individual components are compiled to meet with the regulations of the fire-prevention concept. At the same time, the system also includes additional features to meet with the customer's requirements regarding background music or announcements to be made.

In order to comply with the regulations, the voice alarm system must solely be equipped with EN 54-certified components. These include the management system itself, the power amplifiers and the emergency PSUs as well as the rack which accommodates these components.

The new product line around the **audio management controller EVA-16MEN** offers new possibilities.

With the use of master and slave units, it is possible to cascade up to 10 systems. Thus, more complex applications can be realised. The 4 audio inputs which can be routed to the 4 audio outputs as desired provide great flexibility for the user.

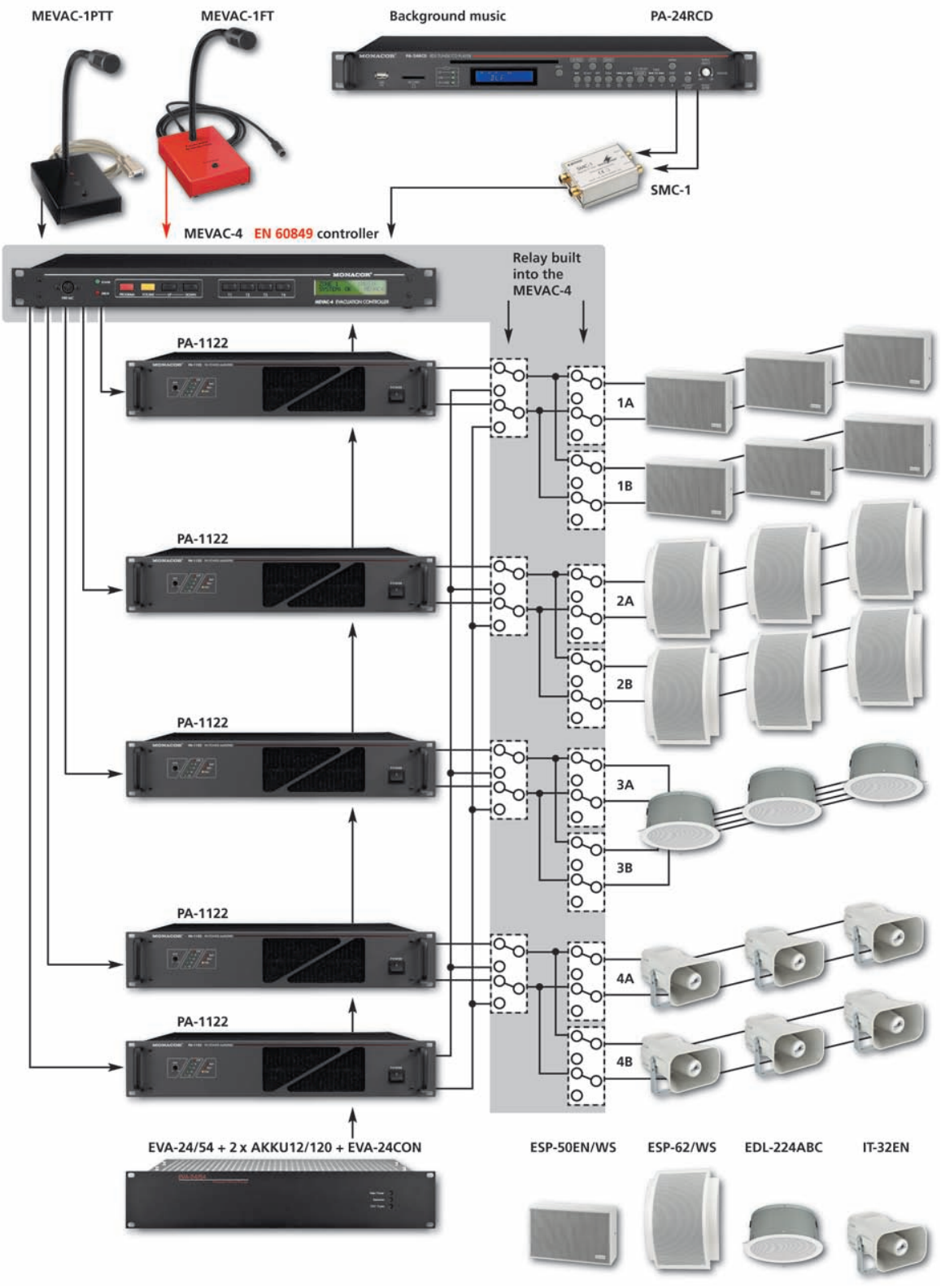
The certified SINUS power amplifier series with power capabilities of 120 W, 240 W and 480 W provides sufficient power reserves.
Extensive accessories, e.g. 80-channel desktop microphone station, fireman's microphone stations or relay units complete this product range which also includes further speaker systems with EN 54-24 certification.

In order to fully implement the requirements of your future applications, we will offer two different ways of delivery:

- As usual, all components required for the system are available as individual items for self-installation. The certification will be done at your premises after completion of installation.
- Alternatively, we will deliver a 19" case made to your individual specifications and already fitted with the required system components which comply with EN 54-16. In this case, you specify the respective requirements and products and we will provide you with a complete offer for a voice alarm system including installation into a rack.

EN 54 - with our products, it's not your emergency!

KNOW-HOW: Example of Application MEVAC System



Voice Alarm Systems (VAS)

PA systems are no longer merely applied as intercom systems or for background music. Nowadays, they are also an essential component in an extensive security concept.
In this case, it is assumed that a building has to be evacuated in case of an emergency. For example, a fire alarm system ensures that all relevant rooms are monitored. However, the system itself could only activate sirens and flashlights in case of an alarm. Attention is definitely drawn to the sirens, but there are no specific instructions given to the people on how to act. Alerting the people via a voice message allows to specifically pass on information and to evacuate the people who are staying in the danger zone at that time.

In order to achieve a uniform standard, the European standard EN 60849 and the standards included within which have been effective since 1998 state that certain buildings must be equipped with a voice alarm system to allow for an evacuation of the people in case of an emergency. The EN 60849 is a system standard and thus contains general standards which the ready fitted system must comply with.
The included standards state the minimum requirements made on the individual products as well as the objective speech intelligibility.

Nowadays, this standard still applies to voice alarm systems (VAS) which are **not automatically** activated by a fire alarm system. In this case, the alarm is usually activated via a house alarm signalling device.

With the implementation of the standard EN 60489, voice alarm systems are compulsory for buildings which exceed a certain size or for place of public assembly which exceed a certain number of people.

In Germany, this applies to e.g.
- Shops with a size of more than 2,000 m²
- Places of public assembly exceeding 200 people
- Hospitals
- Schools
- Hotels

(Type and size of such a building may vary slightly, because national regulations of the individual EU Member State have to be complied with in addition to these standards.)

The requirements made on the VAS have become increasingly complex in the last few years. Additionally, the connection to a fire alarm system (FAS) had to be standardised.

Thus, an advanced DIN 0833 part 4 was elaborated to regulate the integration of a VAS into the fire alarm system.

The main change to the EN 60849 is that each of the applied components must have its own test certificate from the approved test laboratory. These tests are defined in the series of standards EN 54. Different standards are applicable to the different components.

EN 54-4 Emergency PSUs
EN 54-24 Speakers
EN 54-16 Evacuation Controllers

These standards are constantly adapted to the conditions as required. Thus, the standard EN 54-16 now often describes the entire remaining technology, too, e.g. power amplifiers and 19" racks.

In addition, it should be ensured, of course, that the cables are laid according to standards. Depending on the individual German state, this is regulated in the directive MLAR or LAR. These clarify e.g. where and when cables with increased level of fire resistance (E-30 cables) must be used.

A modern VAS can only be integrated into an existing fire protection concept if it meets all these requirements. Thus, it is essential to already include all participants in the planning stage of the fire protection concept. This is the only way to ensure a smooth operation of all components.

In future, only DIN 14675-certified personnel should be able to install voice alarm systems. This is to ensure that the installers are always kept up-to-date with the regulations. Currently, this directive only regulates the setup and operation of fire alarm systems. An extension is currently in progress and should become effective by the end of 2013.

Why Make the Effort?
Due to the integration into the security concept of a building, a faultless operation of all the applied components has to be ensured at all times, of course. Thus, all relevant components and connections must be monitored continuously. In case of a serious fault, an error message must indicate the problem. This is usually done by a NO relay contact. This contact may activate a dialling unit, for example, in order to alert the appropriate security personnel.

The main points of the monitoring are:

A/B-Speaker Circuits
In case of a fault, the sound pressure in one section may only decrease by 3 dB at the most. The speaker circuits are monitored for short circuit, fault to earth, interruption, impedance deviations and thus failure of the speakers.
With the A/B wiring, the speakers of one circuit are divided into two individual paths. Both paths are connected individually with the controller and monitored for faults. Thus, it is ensured that in case one path fails to operate, it does not result in a total failure of the complete circuit. In order to achieve this, it is assumed that the load for both output paths (A/B) within one circuit is almost equal when dividing the power rating of the speakers.

Monitoring the Amplifiers with Emergency Switching
The applied amplifiers are monitored by means of a pilot tone. This tone is outside the audible range and will be mixed to the useful signal. In case, this tone is missing at the output of the amplifier, it will automatically be switched to the spare amplifier. This spare amplifier must be as big as the individual amplifier with the highest power capability of the system.

Digital Voice Storage for the Alarm Messages
The alarm messages must in any case be stored in a non-volatile memory. These memories must also be tested automatically.

Monitoring of a Fireman's Microphone
The fire brigade usually requires a separate microphone directly at the access point for the fire brigade. This microphone requires extra monitoring to ensure its functionality. In addition to the connected leads, the microphone cartridge itself has to be monitored continuously, too. The fireman's microphone thus features the highest priority.

An Emergency Power Supply is Compulsory
In order to ensure an operation also in case the main power supply fails, a 24 V emergency power supply is compulsory. The capacity must ensure that the complete system can be operated at full power for a minimum of 30 minutes. This time may be even longer due to requirements of the underlying fire protection concept.

MEVAC-4 as a Controller
With the MEVAC-4 as a central controller, a very compact PA system for voice alarm systems can be realised. The features of the MEVAC-4 are according to the requirements EN 60849 and VDE 833-4.
In case no malfunction occurs, such an intended system is also allowed to be operated as a sole PA system. Thus, the MEVAC-4 can also be used as a solution for background music and for making announcements for up to 4 channels. Furthermore, the unit also features inputs for background music, a switchable aux input as well as inputs for recalling a previously stored message.

The basic set-up is illustrated in the diagram on the opposite page.

100 V Multi-channel Mixing Amplifier

PA-40120

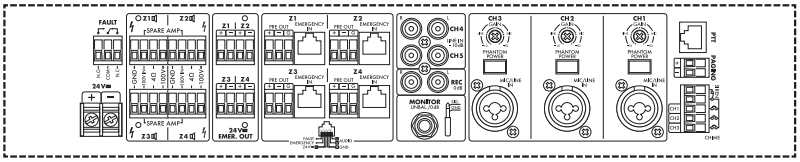
Order No. 17.3220

482 mm 19" 100V 4Ω

4-channel mono mixing amplifier, with 4 active 120 W outputs, for setting up a multi-zone PA system. A switch allows each of the 5 inputs to be assigned to one of the 4 outputs. Thus, it is possible to reproduce varying programmes in different areas. Another advantage is that an announcement in one area will not interrupt the programme in another area. With the optional zone-paging microphone PA-4000RC, the amplifier can be extended to a 4-channel PA system. In combination with the fireman's microphone PA-4000FMP with integrated voice memory, e.g. an alarm system can be set up in schools.

- 4 x 120 W_{RMS}
- 4 zones, can be controlled individually
- 3 mic/line inputs and 2 line inputs
- Built-in adjustable monitor speaker
- Chime and siren can also be activated via external momentary push-button
- Bass, treble and master controls, level display via LEDs, regulated fan
- Phantom power for electret microphones
- Connection for microphone PA-4000PTT
- Connections for 4 PA fireman's microphones PA-4000FMP
- Mains operation and 24 V emergency power operation

Model	PA-40120
General information	
Output power	4 x 120 W_{RMS}, 4 x 170 W_{MAX}
Inputs	
Mic/line 1-3	2.5 mV/5 kΩ, 0.3 V/15 kΩ
Line 4-5	0.3 V/15 kΩ
Outputs	
Speakers	4 x 4 Ω, 4 x 70 V/100 V
Preamplifier	0.775 V/200 Ω
Record	0.775 V/3 kΩ
Frequency range	45-20,000 Hz
Tone control	
Bass	±10 dB/100 Hz
Treble	±10 dB/10 kHz
S/N ratio	
Mic	> 70 dB, A-weighted
Line	> 90 dB, A-weighted
THD	< 1 %
Admiss. ambient temp.	0-40 °C
Power supply	230 V~/50 Hz/1,500 VA, 24 V⎓/40 A
Dimensions	482x90x377 mm, 2 RS
Weight	22.1 kg
Inputs	
Mic/line	3 x 6.3 mm/XLR (combo)
Line	2 x RCA L/R
Push-to-talk microphone	1 x RJ45
Emergency	4 x RJ45
Outputs	
Mom. push-button for chime	screw terminals
Preamplifier	4 x screw terminal
Speakers	4 x screw terminal
Monitor	1 x 6.3 mm jack
Record	1 x RCA L/R
Power supply	
230 V~	mains cable
24 V⎓	screw terminals



PA-4000FMP

Order No. 17.3230

PA fireman's microphone, for PA-40120, wall mounting.

- Hand-held microphone with operational monitoring
- Alarm input for triggering alarm
- Integrated digital voice storage (60 seconds max.) with microphone input or line input (1 x RCA L/R) for recording messages
- Recorded message is also kept without operating voltage
- Siren emits an acoustic signal for 10 seconds when alarm is triggered, volume control
- RJ45 jack for the connection to 4-zone PA amplifier PA-40120
- Signal red lacquered metal housing

Model	PA-4000FMP
Output level	0.775 V/600 Ω, bal.
Siren frequency	800 Hz (continuous sound) 550/1,200 Hz (wailing sound)
Max. recording time	60 seconds
Power supply	24 V⎓ via PA-40120 or optional PSU
Dimensions	250x300x77 mm
Weight	3.2 kg

100 V Multi-channel Mixing Amplifier

PA-12040

482mm 19" | 100V | 4Ω | 8Ω

Order No. 17.3390

PA-4040

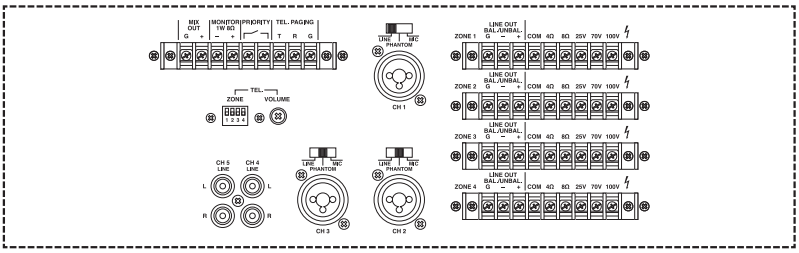
482mm 19" | 100V | 4Ω | 8Ω

Order No. 17.2520

4-channel mono mixing amplifiers, with professional features for general multi-room PA applications.

- 4 x 120 W_{RMS} (PA-12040)
- 4 x 40 W_{RMS} (PA-4040)
- 100 V and 4/8 Ω operation
- Perfect utilisation of the capacity and reliable protection of the connected speakers due to an integrated limiter
- 3 inputs microphone/line via comb. jacks
- 2 inputs line stereo via RCA jacks
- Each input channel with gain control, 2-way tone control, channel mute switch and zone routing switch
- Microphone inputs with +46 V phantom power, can be switched on additionally as desired
- Priority function for channels 1-3, switchable
- Independent paging input, can be routed to all zones
- 4 zone outputs, can be controlled individually
- Zone and monitor line outputs for additional amplifiers or recorders
- Connection for monitor speakers
- Level control via VU meters for zone and monitor
- Adjustable headphone output
- Fan cooling
- 230 V mains operation

Model	PA-12040	PA-4040
General information		
Output power	4 x 120 W_{RMS}	4 x 40 W_{RMS}
	4 x 170 W_{MAX}	4 x 65 W_{MAX}
Inputs		
Mic/line	5 mV/4 kΩ, 100 mV/10 kΩ	5 mV/4k Ω, 100 mV/10 kΩ
Line	100 mV/30 kΩ	100 mV/30 kΩ
Telephone paging	40 mV/5 kΩ	40 mV/5 kΩ
Outputs		
Speakers	4 x 25 V/70 V/100 V, 4 Ω/8 Ω	4 x 25 V/70 V/100 V, 4 Ω/8 Ω
Monitor speakers	8 Ω/1 W	8 Ω/1 W
Line (zone)	1.7 V, bal.	1.7 V, bal.
Line (mix out)	3.95 V	3.95 V
Frequency range	50-17,000 Hz	50-17,000 Hz
Tone control		
Bass	±10 dB/100 Hz	±10 dB/100 Hz
Treble	±10 dB/10 kHz	±10 dB/10 kHz
S/N ratio, mic	> 65 dB	> 65 dB
S/N ratio, line	> 75 dB	> 75 dB
THD	< 1 %	< 1 %
Admiss. ambient temp.	0-40 °C	0-40 °C
Power supply	230 V~/50 Hz/1,200 VA	230 V~/50 Hz/450 VA
Dimensions	482x133x410 mm, 3 RS	482x133x310 mm, 3 RS
Weight	20.5 kg	15 kg
Inputs		
Mic/line	3 x 6.3 mm/XLR comb.	3 x 6.3 mm/XLR comb.
	jack, bal.	jack, bal.
Line	2 x RCA L/R	2 x RCA L/R
Paging	screw terminal	screw terminal
Priority	screw terminal	screw terminal
Outputs		
Line (zone)	screw terminal	screw terminal
Line (mix out)	screw terminal	screw terminal
Headphones	3.5 mm stereo jack	3.5 mm stereo jack
Speakers (monitor)	screw terminal	screw terminal
Speakers (zone)	screw terminal	screw terminal
Power supply	3-pin IEC jack	3-pin IEC jack



100 V Multi-zone Mixing Amplifiers

PA-6240
Order No. 17.2180

TABLE TOP UNIT | 482 mm 19" | 100V

PA-6480
Order No. 17.2190

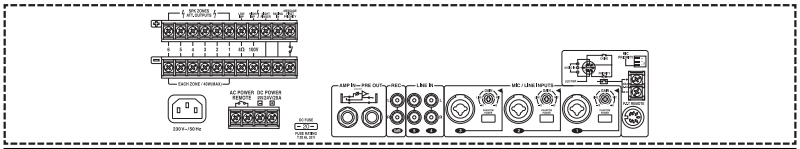
TABLE TOP UNIT | 482 mm 19" | 100V

PA-6600
Order No. 17.2390

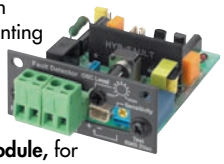
TABLE TOP UNIT | 482 mm 19" | 100V

6-zone mono PA mixing amplifiers

- 1 x 240 W_{RMS} (PA-6240)
- 1 x 480 W_{RMS} (PA-6480)
- 1 x 600 W_{RMS} (PA-6600)
- 6 zones, can be controlled individually
- Chime, continuous sound and wailing sound, automatic mute, 2-tone chime or 4-tone chime (selectable)
- Bass, treble and master controls, level display via LEDs, regulated fan
- Insertions for various functions are available at option
- 17 V phantom power for electret microphones
- Connection for zone paging microphone PA-6000RC
- 1 insertion compartment at the front for automatic alarm message insertion PA-1120DM, a tuner insertion or a CD player insertion, all available at option
- 3 insertion facilities at the rear panel for optional modules with the following features:
  - PA-6FD: fault detection
  - PA-6FM: fault monitoring
  - PA-6FR: anti-feedback
- Mains operation and 24 V emergency power operation
- Removable mounting brackets

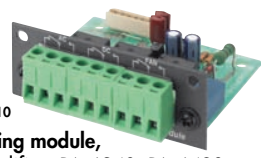


Model	PA-6240	PA-6480	PA-6600
General information			
Output power	240 W_{RMS}	480 W_{RMS}	600 W_{RMS}
	340 W_{MAX}	680 W_{MAX}	850 W_{MAX}
Inputs			
Mic/line 1-3	2.5 mV/5 kΩ, 0.3 V/5 kΩ	2.5 mV/5 kΩ, 0.3 V/5 kΩ	2.5 mV/5 kΩ, 0.3 V/5 kΩ
Line 4-5	0.3 V/15 kΩ	0.3 V/15 kΩ	0.3 V/15 kΩ
Preamplifier	0.775 V/10 kΩ	0.775 V/10 kΩ	0.775 V/10 kΩ
Outputs			
Speakers	100 V/70 V	100 V/70 V	100 V/70 V
Preamplifier	0.775 V/100 Ω	0.775 V/100 Ω	0.775 V/100 Ω
Record	0.775 V/3 kΩ	0.775 V/3 kΩ	0.775 V/3 kΩ
Frequency range	55-16,000 Hz	55-16,000 Hz	55-16,000 Hz
Tone control			
Bass	±10 dB/100 Hz	±10 dB/100 Hz	±10 dB/100 Hz
Treble	±10 dB/10 kHz	±10 dB/10 kHz	±10 dB/10 kHz
S/N ratio			
Mic	> 70 dB, A-weighted	> 70 dB, A-weighted	> 70 dB, A-weighted
Line	> 80 dB, A-weighted	> 80 dB, A-weighted	> 80 dB, A-weighted
THD	< 1 %	< 1 %	< 1 %
Admiss. ambient temp.	0-40 °C	0-40 °C	0-40 °C
Power supply	230 V~/50 Hz/750 VA,	230 V~/50 Hz/1,500 VA,	230 V~/50 Hz/1,700 VA,
	24 V⎓/20 A	24 V⎓/40 A	24 V⎓/50 A
Dimensions	430x133x352 mm, 3 RS	430x133x352 mm, 3 RS	430x133x352 mm, 3 RS
Weight	17 kg	19.5 kg	20 kg
Inputs			
Mic/line	3 x 6.3 mm/XLR (combo)	3 x 6.3 mm/XLR (combo)	3 x 6.3 mm/XLR (combo)
Line	2 x RCA L/R	2 x RCA L/R	2 x RCA L/R
Zone paging microphone	2 x RJ45, optional	2 x RJ45, optional	2 x RJ45, optional
Push-to-talk microphone	1 x 7-pole DIN	1 x 7-pole DIN	1 x 7-pole DIN
Telephone system	screw terminals	screw terminals	screw terminals
Ext. amplifier	1 x 6.3 mm jack	1 x 6.3 mm jack	1 x 6.3 mm jack
Outputs			
Mom. push-button for chime	-	-	-
1 x preamplifier	1 x 6.3 mm jack	1 x 6.3 mm jack	1 x 6.3 mm jack
Speakers	screw terminals	screw terminals	screw terminals
Record	1 x RCA L/R	1 x RCA L/R	1 x RCA L/R
Power supply			
230 V~	3-pin IEC jack	3-pin IEC jack	3-pin IEC jack
24 V⎓	screw terminals	screw terminals	screw terminals



PA-6FD
Order No. 17.2300

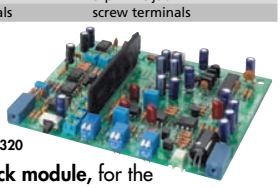
Fault detection module, for the PA amplifiers PA-6240, PA-6480, PA-6600 and PA-1960.
In order to monitor the functions of the PA amplifier, the module transmits a 20 kHz pilot tone and checks this at the amplifier output. In case of a fault, a floating relay contact will be opened. The sensitivity can be adjusted.



PA-6FM
Order No. 17.2310

Fault monitoring module, for the PA amplifiers PA-6240, PA-6480, PA-6600 and PA-1960.

- Indication of mains voltage failure and operating voltage failure
- Indication in case of fan failure
- 3 independent, floating relay outputs (NO/NC)



PA-6FR
Order No. 17.2320

Anti-feedback module, for the PA amplifiers PA-6240, PA-6480 and PA-6600.
The module uses the frequency shift method. The frequency shift of 2-6 Hz is almost noiseless and provides the highest possible protection against acoustic feedback. Beside the activation of the anti-feedback function and the frequency selection (2, 4, 5, 6 Hz), no further adjustments are necessary. Affects mic 1 only.

100 V Multi-zone Mixing Amplifiers

PA-1120

Order No. 17.0780

TABLE TOP UNIT | 482 mm 19" | 100V

PA-1240

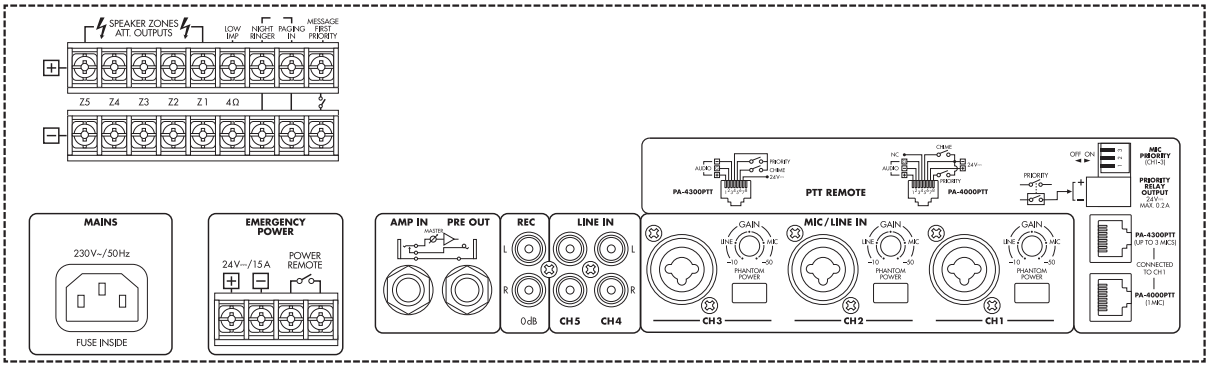
Order No. 17.0790

TABLE TOP UNIT | 482 mm 19" | 100V

5-zone mono PA mixing amplifiers

- 1 x 120 W_{RMS} (PA-1120)
- 1 x 240 W_{RMS} (PA-1240)
- 5 zones, can be controlled individually
- Chime, continuous sound and wailing sound, automatic mute, 2-tone chime or 4-tone chime (selectable)
- Bass, treble and master controls, level display via LEDs, regulated fan
- Insertions for various functions are available at option
- 17 V phantom power for electret microphones
- Connection for zone paging microphone PA-1120RC (available at option)
- Connection for push-to-talk microphone PA-4000PTT or PA-4300PTT
- Automatic alarm announcement with insertion PA-1120DM (available at option)
- Mains operation and 24 V emergency power operation
- Removable mounting brackets

Model	PA-1120	PA-1240
General information		
Output power	120 W_{RMS}	240 W_{RMS}
	170 W_{MAX}	340 W_{MAX}
Inputs		
Mic/line 1-3	2.5 mV/5 kΩ, 0.3 V/5 kΩ	2.5 mV/5 kΩ, 0.3 V/5 kΩ
Line 4-5	0.3 V/15 kΩ	0.3 V/15 kΩ
Preamplifier	0.775 V/10 kΩ	0.775 V/10 kΩ
Outputs		
Speakers	100 V/70 V	100 V/70 V
Preamplifier	0.775 V/100 Ω	0.775 V/100 Ω
Record	0.775 V/3 kΩ	0.775 V/3 kΩ
Frequency range	55-16,000 Hz	55-16,000 Hz
Tone control		
Bass	±10 dB/100 Hz	±10 dB/100 Hz
Treble	±10 dB/10 kHz	±10 dB/10 kHz
S/N ratio		
Mic	> 70 dB, A-weighted	> 70 dB, A-weighted
Line	> 80 dB, A-weighted	> 80 dB, A-weighted
THD	< 1 %	< 1 %
Admiss. ambient temp.	0-40 °C	0-40 °C
Power supply	230 V~/50 Hz/340 VA,	230 V~/50 Hz/630 VA
	24 V⎓/15 A	24 V⎓/27 A
Dimensions	482x133x352 mm, 3 RS	482x133x352 mm, 3 RS
Weight	13 kg	14 kg
Inputs		
Mic/line	3 x 6.3 mm/XLR (combo)	3 x 6.3 mm/XLR (combo)
Line	2 x RCA L/R	2 x RCA L/R
Zone paging microphone	2 x RJ45, optional	2 x RJ45, optional
Push-to-talk microphone	2 x RJ45	2 x RJ45
Telephone system	screw terminals	screw terminals
Ext. amplifier	1 x 6.3 mm jack	1 x 6.3 mm jack
Outputs		
Mom. push-button for chime	-	-
1 x preamplifier	1 x 6.3 mm jack	1 x 6.3 mm jack
Speakers	screw terminals	screw terminals
Record	1 x RCA L/R	1 x RCA L/R
Power supply		
230 V~	3-pin IEC jack	3-pin IEC jack
24 V⎓	screw terminals	screw terminals



100 V Multi-zone Mixing Amplifiers

PA-5240

TABLE TOP UNIT | 482 mm 19" | 100V

Order No. 24.3140

PA-5480

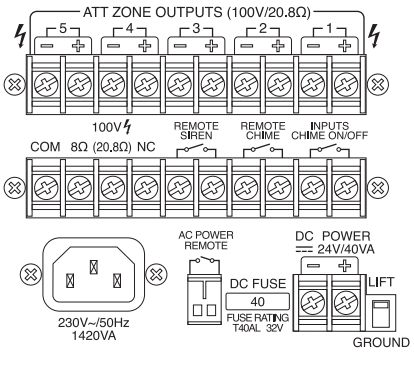
TABLE TOP UNIT | 482 mm 19" | 100V

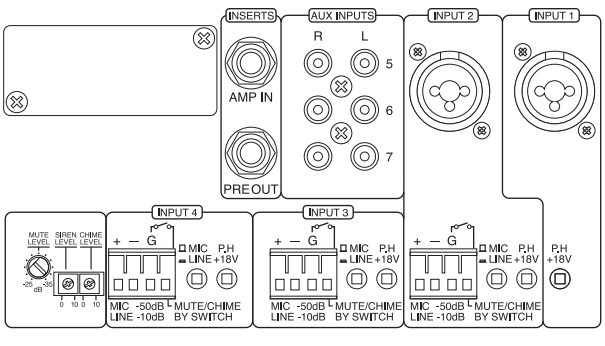
Order No. 24.3150

5-zone mono PA mixing amplifiers

- 1 x 240 W_{RMS} (PA-5240)
- 1 x 480 W_{RMS} (PA-5480)
- 5 zones, can be controlled individually
- Chime, wailing sound, automatic mute, chime and siren can also be activated via external momentary push-button, 2-tone chime or 4-tone chime (selectable)
- Bass, treble and master controls, level display via LEDs, regulated fan
- Insertions for various functions are available at option
- Phantom power for electret microphones
- Connection for microphone PA-5000PTT
- Alarm announcement with insertion PA-1120DM (available at option)
- Mains operation and 24 V emergency power operation
- Removable mounting brackets

Model	PA-5240	PA-5480
General information		
Output power	240 W_{RMS}	480 W_{RMS}
	340 W_{MAX}	680 W_{MAX}
Inputs		
Mic 1	2.5 mV/2 kΩ	2.5 mV/2 kΩ
Mic/line 2-4	2.5 mV/2 kΩ, 0.3 V/200 kΩ	2.5 mV/2 kΩ, 0.3 V/200 kΩ
Line 5-7	0.3 V/5 kΩ	0.3 V/5 kΩ
Preamplifier	0.775 V/10 kΩ	0.775 V/10 kΩ
Outputs		
Speakers	100 V/70 V	100 V/70 V
Preamplifier	0.775 V/100 Ω	0.775 V/100 Ω
Frequency range	55-16,000 Hz	55-16,000 Hz
Tone control		
Bass	±10 dB/100 Hz	±10 dB/100 Hz
Treble	±10 dB/10 kHz	±10 dB/10 kHz
S/N ratio		
Mic	> 70 dB	> 70 dB
Line	> 80 dB	> 80 dB
THD	< 1 %	< 1 %
Admiss. ambient temp.	0-40 °C	0-40 °C
Power supply	230 V~/50 Hz/750 VA,	230 V~/50 Hz/1,500 VA,
	24 V⎓/20 A	24 V⎓/40 A
Dimensions	482x133x352 mm, 3 RS	482x133x352 mm, 3 RS
Weight	16.5 kg	20 kg
Inputs		
Mic/line	2 x 6.3 mm/XLR (combo),	2 x 6.3 mm/XLR (combo),
	1 x 6.3 mm jack	1 x 6.3 mm jack
Line	screw terminals,	screw terminals,
	3 x RCA L/R	3 x RCA L/R
Zone paging microphone	screw terminal	screw terminal
Push-to-talk microphone	screw terminal	screw terminal
Telephone	-	-
Preamplifier	1 x 6.3 mm jack	1 x 6.3 mm jack
Outputs		
Mom. push-button for chime	screw terminals	screw terminals
Preamplifier	1 x 6.3 mm jack	1 x 6.3 mm jack
Speakers	screw terminals	screw terminals
Power supply		
230 V~	3-pin IEC jack	3-pin IEC jack
24 V⎓	screw terminals	screw terminals





100 V Multi-zone Mixing Amplifiers

PA-1200

Order No. 17.0710

TABLE TOP UNIT | 100V | 4Ω | 8Ω

4-zone mono PA mixing amplifier

- 1 x 120 W_{RMS}
- Silent operation due to fanless cooling concept
- Chime, continuous sound and wailing sound, automatic mute, chime can also be activated via external momentary push-button, 2-tone chime or 4-tone chime (selectable)
- Bass, treble and master controls, level display via LEDs
- 15 V phantom power for channels 2 and 3
- Insertions for various functions are available at option
- 482 mm (19") rack installation with mounting frame PA-1200RM, available at option
- Mains operation and 24 V emergency power operation

Model	PA-1200
General information	
Output power	120 W_{RMS}
	170 W_{MAX}
Inputs	
Mic	1.5 mV/600 Ω
Line	150 mV/47 kΩ
Phono	1 mV/47 kΩ (RIAA)
Outputs	
Speakers	1 x 4 Ω, 1 x 8 Ω, 4 x 70/100 V
Preamplifier	1 V/1 kΩ
Frequency range	80-15,000 Hz
Tone control	
Bass	±10 dB/100 Hz
Treble	±10 dB/10 kHz
S/N ratio	
Mic	> 60 dB
Line	> 70 dB
THD	< 1 %
Admiss. ambient temp.	0-40 °C
Power supply	230 V~/50 Hz/280 VA, 24 V⎓/11 A
Dimensions	420x122x350 mm
Weight	13 kg
Inputs	
Mic	1 x 6.3 mm jack
Mic/line	3 x XLR, bal.
Line	1 x RCA L + R
Phono/line	1 x RCA L + R
Telephone input	1 x twin spring-load. term.
Outputs	
Tuner	1 x twin spring-load. term.
Mom. push-button for chime	1 x twin spring-load. term.
1 x preamplifier	1 x 6.3 mm jack
Speakers	7 x screw terminal
Power supply	
230 V~	1 x 3-pin IEC jack
24 V⎓	screw terminals

Model	PA-312Z
Output power	120 W_{RMS}, 160 W_{MAX}
Mic input	5 mV/600 Ω (XLR, bal.)
	2.5 mV/2 kΩ (6.3 mm jack)
Line input	775 mV/10 kΩ
Aux input	350 mV/10 kΩ
Telephone input	775 mV/10 kΩ (EMC)
Speaker output	4-16 Ω, 70/100 V
Frequency range	50-16,000 Hz
Equalizer bass	±10 dB/100 Hz
Equalizer, treble	±10 dB/10 kHz
S/N ratio	66 dB (mic)
	80 dB (aux)
THD	< 0.5 %
Power supply	230 V/50 Hz/420 VA
Dimensions	430x88x335 mm, 2 RS
Weight	9.7 kg
Inputs	1 x 6.3 mm jack (mic 1)
	2 x 6.3 mm jack, 2 x XLR (mic 2-3)
	2 x RCA L/R (line 2-3)
	2 x RCA L/R (aux 1-2)
	screw terminals (emergency)
Outputs	2 x RCA L/R (mix out)

PA-312Z

Order No. 17.3650

TABLE TOP UNIT | 482 mm 19" | 100V | 4Ω | 8Ω | 16Ω

5-zone mono PA mixing amplifier

- 1 x 120 W_{RMS}
- 5 zones, can be switched individually
- 1 unbalanced microphone input
- 2 balanced microphone inputs, can optionally also be used as line inputs
- 2 aux inputs
- 1 emergency input with adjustable automatic talkover
- Speaker outputs via screw terminals
- 1 line output
- Input and output level controls
- 2-way tone control for the output
- 48 V phantom power supply for channels 2 and 3, can be switched on additionally
- 482 mm (19") rack installation with supplied mounting brackets

Insertion Modules

PA-1140RCD

Order No. 17.3530

RDS tuner/CD player insertion with USB interface, for the PA mixing amplifiers with insertion compartment at the front.
- USB flash drive can be connected directly

FM/AM tuner section:
- RDS function for FM
- 24 station presets (18 x FM, 6 x AM)
- Digital display
- Station scanning

CD player section:
- Anti-shock system
- Slot-in mechanism
- Random play, scan and repeat functions
- Display of track/time
- Shock-proof due to oil shock absorber
- Audio CD/CD-R/CD-RW/MP3 CD

PA-1200RDS

Order No. 17.2770

FM/AM RDS tuner insertion, for the PA mixing amplifiers with insertion compartment.
- RDS function for FM
- 24 station presets (18 x FM, 6 x AM)
- Digital display
- Station scanning
- Automatic switching-on after power failure

PA-1120DM

Order No. 17.0830

Digital message insertion, for the PA mixing amplifiers with insertion compartment.
- 16 Mbits SRAM, 4.5 minutes max. (upgradable to 32 Mbits)
- 6 memory places for announcements or similar
- Automatic start of alarm announcement

PA-1200C

Order No. 17.1160

Timer insertion, with DCF77 radio-controlled clock receiver for the PA mixing amplifiers with insertion compartment.
- 40 memory places, to be programmed and edited as desired
- 3 selectable chimes, remote-controllable
- 3 relay contacts (NO/NC) for switching external units
- A combination with digital message insertion PA-1120DM allows time-controlled announcements

PA-1204EX

Order No. 24.0250

4-way module extension, for all insertion modules of the PA series.
- For accepting up to 4 insertions, 2 max. with CD player mechanism
- Opening for using insertions with radio reception module
- XLR connections
- Mains operation or 24 V emergency power operation
- 482 mm (19") rack installation with fitted mounting brackets

- Dimensions without brackets (WxHxD): 425x135x380 mm, 3 RS
- Weight: 7.7 kg
- Power supply: 230 V~/50 Hz/55 VA or 24 V⎓/2 A

PA-1200EX

Order No. 24.8160

Dual module extension, for all insertion modules of the PA series.
- For accepting up to 2 insertions
- Opening for using insertions with radio reception module
- XLR connection
- Mains operation or 24 V emergency power operation
- 482 mm (19") rack installation with fitted mounting brackets
- Dimensions without brackets (WxHxD): 425x88x380 mm, 2 RS
- Weight: 4.5 kg
- Power supply: 230 V~/50 Hz/55 VA or 24 V⎓/2 A

Desktop Microphones

PA-6000RC

Order No. 23.5370

PA zone paging desktop microphone, for the connection to PA-6240, PA-6480 and PA-6600.

- Selector buttons for speaker zones 1-6
- Start function/pause function for 6 selectable announcements which are stored in the digital module PA-1120DM
- Automatic chime via microphone announcement button
- Adjustable line input (RCA L/R) for the connection of a signal source, e.g. CD player or tape deck
- LED display for transmission mode
- Power supply via PA-6240, PA-6480, PA-6600
- RJ45 jack for connecting additional PA-6000RC microphones with slave/priority switch
- Supplied with connection module for PA-6240, PA-6480 and PA-6600

PA-1120RC

Order No. 23.2440

PA zone paging desktop microphone, for the connection to PA-1120 and PA-1240.

- Selector buttons for speaker zones 1-5
- Start function/pause function for 6 selectable announcements which are stored in the digital module PA-1120DM
- Adjustable line input (RCA L/R) for the connection of a signal source, e.g. CD player or tape deck
- LED display for transmission mode
- Automatic chime via microphone announcement button
- Power supply via PA-1120, PA-1240
- RJ45 jacks for connecting additional PA-1120RC microphones with slave/priority switch
- Supplied with connection module for PA-1120 and PA-1240

Ten PA-1120RC max. can be connected to each amplifier!

PA-4000RC

Order No. 23.6010

PA zone paging desktop microphone, for the connection to PA-40120.

- Selector buttons for 4 zones, for activating one or several zones
- ALL CALL button for activating all of the 4 zones
- Automatic chime via microphone announcement button (talk)
- LED status indication for the zone buttons (busy, emergency), power, mic fault, signal and talk
- Built-in gooseneck electret microphone
- Adjustable microphone sensitivity
- Chime can additionally be switched on or off
- 24 V power supply via PA-40120
- Two RJ45 jacks for the connection to PA-40120 and additional PA-4000RC
- Supplied with connection module for PA-40120
- Up to 32 PA-4000RC can be connected to PA-40120 via bus
- Supplied with 3 m connection cable (Cat. 5e)

PA-5000PTT

Order No. 23.3260

PA desktop microphone (push-to-talk), especially suitable for the connection to PA-5240, PA-5480.

- Push-to-talk button with switching contact for activating the chime at the amplifier
- Connection via screw terminal
- Output for priority function

Three PA-5000PTT can be connected to each amplifier!

PA-4000PTT

Order No. 23.6000

PA desktop microphone (push-to-talk), for the connection to PA-40120 or PA-1120, PA-1240, PA-1412MX and the PA-6000 series.

- Automatic chime via microphone announcement button (talk)
- Chime can additionally be switched on or off
- Power supply via connected amplifiers
- RJ45 jack for the connection to suitable amplifiers
- Supplied with 3 m connection cable (Cat. 5e)
- 7-pole DIN jack for the connection to suitable amplifiers

Only one PA-4000PTT can be connected to each amplifier

PA-4300PTT

Order No. 23.0980

PA desktop microphone (push-to-talk), for the connection to PA-1120 or PA-1240.

- Automatic chime via microphone announcement button (talk)
- Chime can additionally be switched on or off
- LED indication for talk and busy
- Power supply via connected amplifier
- RJ45 jack for connecting additional PA-4300PTT with slave/priority switch

Three PA-4300PTT can be connected to each amplifier

Introduction to the 100 V PA Technology

The following pages show the planning and setting-up of PA systems for easy rebuilding, give some basic information and useful hints.
The 100 V PA technology includes PA systems for background music, for announcement systems or for PA applications at events. These PA systems have become indispensable.

Some of the Applications are:
- Sports fields and gyms
- Department stores
- Workshops and warehouses
- Office buildings
- Churches and chapels
- Restaurants and hotels

Basic Characteristic
In a 100 V PA system, the output signal for the speakers following an amplifier is transformed to the higher 100 V value by a transformer. This corresponds to the rated power of the amplifier.
This transformer is usually integrated into the amplifier. On the other side, ahead of the speakers, there is also a transformer which transforms this 100 V signal down to the voltage suitable for the speaker. This transformer, too, is usually mounted in or at the speaker.

Mono Contra Stereo
If 100 V PA systems are regarded in detail, you can notice that most of them are mono systems. Why? To use a stereo signal, 2 speaker systems must not only be driven by 2 power amplifiers but the listener must be at the same distance from both speakers and must stay there. If he leaves this position, there is no stereo perception anymore. However, this is always the case e.g. with PA background applications because people move freely through the room. Thus, a genuine mono transmission is the absolutely right choice in this case.

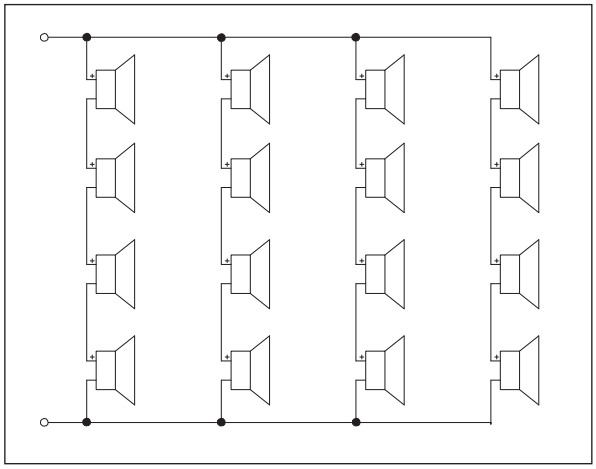
By the way, this mono/stereo consideration is not a question of quality because a mono signal is not inferior to a stereo signal regarding the technical values. The quality is solely determined by the components and especially by the speaker systems used. The sound of a horn speaker is of course not as good as that of a HiFi system. This is, however, due to the speaker type and not due to the built-in 100 V transformer. Nowadays, a modern transformer can achieve a frequency response of 20 to 20,000 Hz.

What is the basic difference between a 100 V PA system and the standard HiFi stereo system?
To simplify the matter, in case of a HiFi system it is tried to arrange a place or a suite and the speakers in the room in such a way, that an optimum sound quality will be obtained. This can also be achieved by rearranging the furniture.

This is not possible, e.g. for background PA applications in a shop. In this case, the furniture cannot be rearranged and the speakers have to be placed where people are gathering. To make this possible, a great number of different speaker types is available, e.g. flush mount speakers, wall speakers, column speakers or horn speakers.
The real advantage of a 100 V PA system can be noticed when wiring the speakers.

With PA systems or systems for PA background applications, the number of speaker systems is sometimes very high.

Example:
A furniture shop. Furniture shops have large areas so that there must be an even distribution of sometimes up to 20 speakers or more to be mounted over the area.
In the following text we regard a system with 16 speakers to be connected to an 8 Ω amplifier.
If 8 Ω speakers are used, it must be ensured that the output impedance of the amplifier does not fall below the minimum value. Therefore, it is not possible to connect all 16 speakers in parallel. This would result in a total impedance of 0.5 Ω by which the amplifier would be totally overloaded and destroyed. Thus, the speakers must be wired in series and in parallel so that the impedance of the amplifier does not fall below the minimum value. Our example shows this as follows:



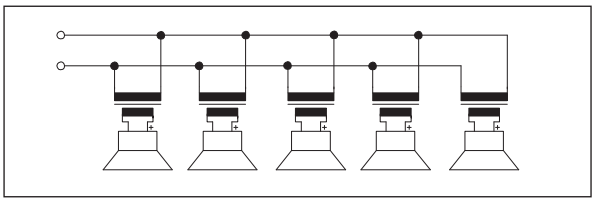
According to the drawing it looks very easy but it means a considerable effort of cabling in a 1,000 m² large hall because all speaker cables must be laid to a central point or the wiring has to be made directly at the speaker.

Due to this type of connection, the cabling becomes very complex which means more effort in case of repair. The actual weak point of this kind of speaker arrangement is that all speakers must have the same power values, otherwise individual speakers will be overloaded.

Failure of one speaker also means failure of 3 further speakers at the same time. Besides, such a speaker system can only be extended with great difficulty.

How to Solve these Problems?
If speaker systems are used with a transformer which is built in or connected ahead, all speakers can be connected in parallel. Each speaker only picks up the power from the 100 V line which is adjusted at the transformer. Thus, it is possible to interconnect speakers of different power ratings without any problems.

The total power is calculated from the total of all connected speakers.



An Example:
A PA system for a sports facility.

The following speakers are selected for this purpose:

2 x 15 W for the outdoor facility
4 x 15 W for the gym
6 x 2 W for the changing rooms and sanitary rooms

This results in a required total power of **102 W**.

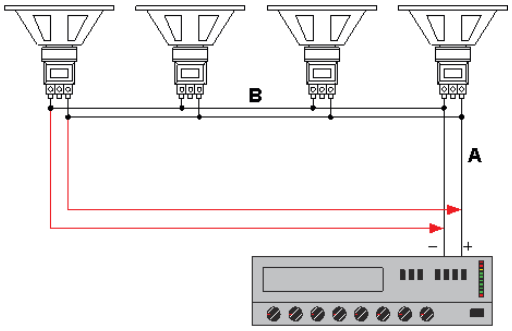
When choosing the amplifier, please ensure that the value indicated as output power is higher than the required total power.
In our calculation example a **PA-1200** with an output power of 120 W could be used.

NOTE! **We recommend to plan a reserve for the amplifier output power so that subsequent extensions can be made without any problems.**

Laying Speaker Cables as a Ring Line

The speakers are generally connected in parallel to a line coming from the amplifier. The line ends at the last speaker. From a technical point of view, this is not a problem. With regard to the operating reliability, however, this method is not the perfect solution. In case the line is interrupted anywhere along A or B, every speaker situated behind that point will no longer operate.

However, if the line is fed from the last speaker back to the amplifier (indicated in red) and then connected to the line coming from it with the right polarity, the operating reliability is increased considerably. An interruption at one of the points would not result in a failure of a speaker, anymore.



Configuration with Different Speakers

It frequently happens that both 100 V speakers and low-impedance speakers are to be connected to a 100 V PA system at the same time.

This has to be avoided in any case, as the amplifier will be overloaded. In case of optimum level control, both the low-impedance speaker and the 100 V speaker would each require the maximum amplifier power.

A destruction of the amplifier will be the result. It is better to switch a 100 V transformer ahead of the low impedance speaker.

100 V Mixing Amplifiers

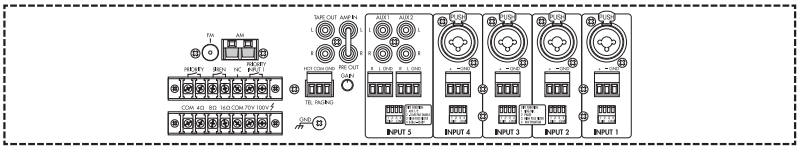
PA-8120RCD

Order No. 17.3040

482 mm 19" | USB | MP3 | 100V | 4Ω

Mono PA mixing amplifier, with integrated CD/MP3 player and radio.

- 1 x 120 W_{RMS}
- CD player with drawer mechanism, repeat function and random play, reproduction of audio CD/CD-R/CD-RW, MP3 CD, USB interface, separate on/off switch
- AM/FM radio module with 5 programmable station buttons, scan buttons, volume control and separate on/off switch
- 4 mic/line inputs, to be configured via DIP switches (mic/line, phase, high-pass filter, 48 V phantom power)
- 2 aux inputs, to be configured via DIP switches (aux1/aux2, 10 dB attenuation, high-pass filter)
- Siren function and chime function
- Priority circuit
- Speaker outputs via screw terminals
- Line output
- Insert facility for preamplifier
- Input and output level controls
- 2-way tone control for the output
- 482 mm (19") rack installation



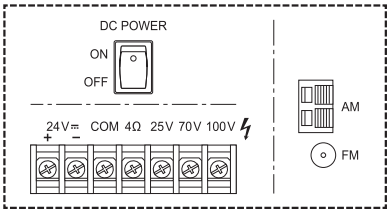
PA-890RCD

Order No. 17.3030

TABLE TOP UNIT | USB | MP3 | 100V | 4Ω

Mono PA mixing amplifier, with integrated CD/MP3 player and radio.

- 1 x 80 W_{RMS}
- CD player with drawer mechanism, repeat function and random play, reproduction of audio CD/CD-R/CD-RW, MP3 CD, USB interface, separate on/off switch
- AM/FM radio module with 5 programmable station buttons, scan buttons, separate on/off switch
- 3 mic inputs, 1 of which can be switched mic/line
- Siren function
- Speaker outputs via screw terminals
- Input level control
- 2-way tone control for the output
- Mains operation or 24 V emergency power operation



Model	PA-8120RCD	PA-890RCD
Output power	120 W_{RMS}	80 W_{RMS}
Mic input	1.8 mV	1.5 mV
Aux input	300 mV	300 mV
Speaker output	4/8/16 Ω, 70/100 V	4 Ω, 70/100 V
Frequency range	50-16,500 Hz, ±3 dB	50-15,000 Hz, ±3 dB
Equalizer bass	±10 dB/100 Hz	±10 dB/100 Hz
Equalizer midrange	-	-
Equalizer treble	±10 dB/10 kHz	±10 dB/10 kHz
S/N ratio	> 65 dB	> 52 dB
THD	0.5 % (1 W)	1 %
Power supply	230 V~/50 Hz/365 VA	230 V~/50 Hz/265 VA
Admiss. ambient temp.	0-40 °C	0-40 °C
Dimensions	483x110x450 mm, 2 RS	400x340x110 mm, 2 RS
Weight	10.5 kg	9.5 kg
Special feature	USB	USB
Inputs		
Microphone	mic/line:	3 x 6.3 mm jack
	4 x XLR/6.3 mm (combo)	
	4 x plug-in screw terminal	
Aux, phono	2 x RCA L/R (aux 1/2)	1 x 6.3 mm jack
	2 x plug-in screw terminal	

100 V Mixing Amplifiers

PA-930CD

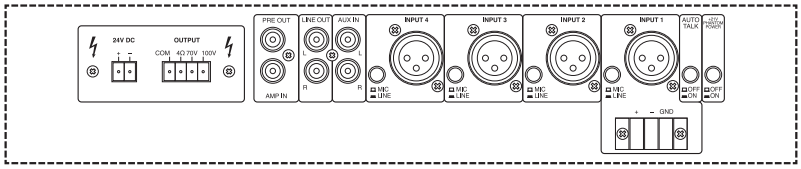
Order No. 17.2920

TABLE TOP UNIT | 482 mm 19" | COMPACT DISC DIGITAL AUDIO | MP3 | USB | 100V

Mono PA mixing amplifier, with integrated CD player.

- 1 x 120 W_{RMS}
- CD player with MP3 reproduction and USB interface, slot-in mechanism, random play, repeat function and track programming, reproduction of audio CD/CD-R/CD-RW/MP3 CD
- CD autostart after switching on, selectable
- Silent operation due to fanless cooling concept
- 4 balanced mic/line inputs
- Mic 1 with priority circuit and automatic talkover
- Additional connection for desktop microphone via screw terminal
- 1 aux input
- Speaker outputs via screw terminals
- Line output
- Insert facility for preamplifier
- Input and output level controls
- 2-way tone control for the output
- 21 V phantom power for electret microphones
- Supplied with remote control for the CD player
- 482 mm (19") rack installation with supplied mounting brackets
- Mains operation or 24 V emergency power operation

Model	PA-930CD
Output power	120 W_{RMS}, 160 W_{MAX}
Mic input	1.5 mV
Aux input	300 mV
Phono input	-
Speaker output	4 Ω, 70/100 V
Frequency range	50-15,000 Hz, ±3 dB
Equalizer bass	±10 dB/100 Hz
Equalizer midrange	-
Equalizer treble	±10 dB/10 kHz
S/N ratio	> 92 dB
THD	1 % (120 W_{RMS})
Power supply	230 V~/50 Hz/300 VA, 24 V⎓/9 A
Admiss. ambient temp.	0-40 °C
Dimensions	430x95x380 mm, 2 RS
Weight	11.7 kg
Special feature	
Inputs	
Microphone	4 x XLR (mic, line)
Aux, phono	1 x RCA L/R (aux)



PA-802CD

Order No. 17.3020

TABLE TOP UNIT | COMPACT DISC DIGITAL AUDIO | USB | MP3 | 100V | 4Ω

Mono PA mixing amplifier, with integrated CD and MP3 player.

- 1 x 15 W_{RMS}
- CD player with drawer mechanism, LCD, repeat function and random play, reproduction of audio CD/CD-R/CD-RW, MP3 CD, USB interface
- Silent operation due to fanless cooling concept
- 2 mic inputs
- Mic 1 with automatic talkover
- 1 aux input
- Speaker outputs via screw terminals
- Siren function and chime function

- Level control for each input and CD player
- Mains operation or 12 V emergency power operation

PA-802USB

Order No. 17.3870

TABLE TOP UNIT | USB | SD | MP3 | 100V | 4Ω | 8Ω

Mono PA mixing amplifier, with integrated MP3 player.

- 1 x 15 W_{RMS}
- Adjustable MP3 player with USB interface and SD card slot, illuminated display
- Silent operation due to fanless cooling concept
- 2 microphone inputs
- Mic 1 with automatic talkover
- 1 aux input, 1 phono input, switchable
- Speaker outputs via spring-loaded terminals
- Insert facility for preamplifier
- Level control for each input

- Tone control for the output
- Mains operation or 12 V battery operation
- Supplied with mounting brackets

100 V Mixing Amplifiers

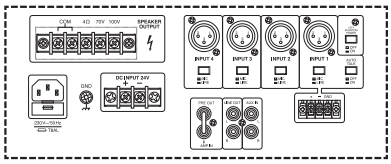
PA-980

482mm 19" 100V 4Ω

Order No. 17.2900

Mono PA mixing amplifier

- 1 x 480 W_{RMS}
- 4 balanced mic/line inputs
- Mic 1 with priority circuit and automatic talkover
- Additional connection for desktop microphone via screw terminal
- 1 aux input



- Speaker outputs via screw terminals
- Line output
- Insert facility for preamplifier
- Input and output level controls
- 2-way tone control for the output
- 21 V phantom power, selectable
- Temperature-controlled fan, continuously adjustable
- Mains operation or 24 V emergency power operation

Model	PA-980
Output power	480 W_{RMS}, 680 W_{MAX}
Mic input	1.5 mV
Aux input	300 mV
Phono input	-
Speaker output	4 Ω, 70/100 V
Frequency range	50-15,000 Hz, ±3 dB
Equalizer bass	±10 dB/100 Hz
Equalizer midrange	-
Equalizer treble	±10 dB/10 kHz
S/N ratio	> 92 dB
THD	< 2 %
Power supply	230 V~/50 Hz/1,350 VA, 24 V⎓/14 A
Admiss. ambient temp.	0-40 °C
Dimensions	482x135x410 mm, 3 RS
Weight	26 kg
Special feature	-
Inputs	
Microphone	4 x XLR
Aux, phono	1 x RCA L/R (aux)

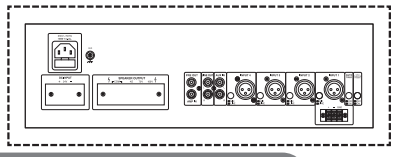
PA-940

TABLE TOP UNIT 482mm 19" 100V 4Ω

Order No. 17.2090

Mono PA mixing amplifier

- 1 x 240 W_{RMS}
- 4 balanced mic/line inputs
- Mic 1 with priority circuit and automatic talkover
- Additional connection for desktop microphone via screw terminal
- 1 aux input



- Speaker outputs via screw terminals
- Line output
- Insert facility for preamplifier
- Input and output level controls
- 2-way tone control for the output
- 21 V phantom power, selectable
- Temperature-controlled fan, continuously adjustable
- Mains operation or 24 V emergency power operation
- Removable mounting brackets

Model	PA-940
Output power	240 W_{RMS}, 340 W_{MAX}
Mic input	1.5 mV
Aux input	300 mV
Phono input	-
Speaker output	4 Ω, 70/100 V
Frequency range	50-15,000 Hz, ±3 dB
Equalizer bass	±10 dB/100 Hz
Equalizer midrange	-
Equalizer treble	±10 dB/10 kHz
S/N ratio	> 92 dB
THD	< 2 %
Power supply	230 V~/50 Hz/520 VA, 24 V⎓/18 A
Admiss. ambient temp.	0-40 °C
Dimensions	482x135x380 mm, 3 RS
Weight	19.5 kg
Special feature	
Inputs	
Microphone	4 x XLR
Aux, phono	1 x RCA L/R (aux)

100 V Mixing Amplifiers

PA-906

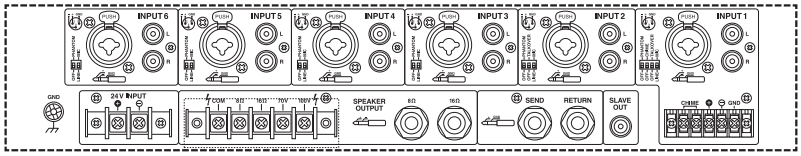
Order No. 17.3170

TABLE TOP UNIT | 482 mm 19" | 100V

Mono PA mixing amplifier

- 1 x 120 W_{RMS}
- Silent operation due to fanless cooling concept
- 6 inputs via comb. jacks mic (XLR)/line (6.3 mm)
- 6 inputs via stereo RCA jacks
- Mic 1 and mic 2 with priority circuit
- Additional connection for desktop microphone via screw terminal
- Chime feature for input channel 1
- Speaker outputs via screw terminals
- Additional 6.3 mm jack connections for low-impedance speakers
- Slave output
- Insert facility for preamplifier
- Input and output level controls
- 2-way tone control for the output
- Phantom power: 48 V, can be switched for each input
- 482 mm (19") rack installation with supplied mounting brackets
- Mains operation or 24 V emergency power operation

Model	PA-906
Output power	120 W_{RMS}, 160 W_{MAX}
Mic input	1.5 mV/5 kΩ (bal.)
	26 mV/5 kΩ (unbal.)
Line input	270 mV/10 kΩ (bal.)
	300 mV/10 kΩ (unbal.)
Speaker output	8/16 Ω, 70/100 V
Frequency range	100-15,000 Hz, ± 3 dB
Equalizer bass	± 10 dB/100 Hz
Equalizer midrange	-
Equalizer treble	±10 dB/10 kHz
S/N ratio	> 92 dB
THD	< 2 %
Power supply	230 V~/50 Hz/320 VA,
	24 V⎓/7 A
Admiss. ambient temp.	0-40 °C
Dimensions	430x88x340 mm, 2 RS
Weight	12 kg
Inputs	6 x XLR, bal. (mic./line)
	6 x 6.3 mm jack, unbal. (mic./line)
	6 x RCA L/R (line)



PA-900

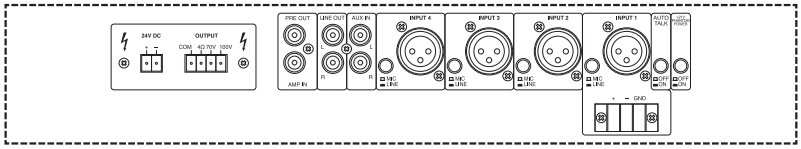
Order No. 17.1190

TABLE TOP UNIT | 482 mm 19" | 100V | 4Ω

Mono PA mixing amplifier

- 1 x 120 W_{RMS}
- Silent operation due to fanless cooling concept
- 4 balanced mic/line inputs
- Mic 1 with priority circuit and automatic talkover
- Additional connection for desktop microphone via screw terminal
- 1 aux input
- Speaker outputs via screw terminals
- Line output
- Insert facility for preamplifier
- Input and output level controls
- 2-way tone control for the output
- 21 V phantom power, selectable
- Mains operation or 24 V emergency power operation
- Removable mounting brackets

Model	PA-900
Output power	120 W_{RMS}, 160 W_{MAX}
Mic input	1.5 mV
Aux input	300 mV
Phono input	-
Speaker output	4 Ω, 70/100 V
Frequency range	50-15,000 Hz, ±3 dB
Equalizer bass	±10 dB/100 Hz
Equalizer midrange	-
Equalizer treble	±10 dB/10 kHz
S/N ratio	> 92 dB
THD	< 2 %
Power supply	230 V~/50 Hz/300 VA,
	24 V⎓/9 A
Admiss. ambient temp.	0-40 °C
Dimensions	482x88x275 mm, 2 RS
Weight	10 kg
Special feature	
Inputs	
Microphone	4 x XLR
Aux, phono	1 x RCA L/R (aux)



100 V Mixing Amplifiers

PA-324

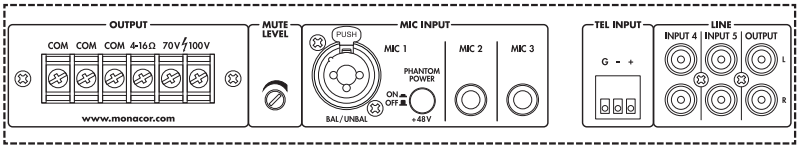
Order No. 17.4420

TABLE TOP UNIT | 482 mm 19" | 100V | 4Ω | 8Ω | 16Ω | new

Mono PA mixing amplifier

- 1 x 240 W_{RMS}
- 3 microphone inputs, one of which is a balanced input
- Mic 1 with priority circuit and adjustable automatic talkover
- 2 aux inputs
- 1 telephone input for telephone systems with audio output
- Speaker outputs via screw terminals
- 1 line output
- Input and output level controls
- 2-way tone control for the output
- 48 V phantom power supply for channel 1, can be switched on additionally
- 482 mm (19") rack installation with supplied mounting brackets

Model	PA-324
Output power	240 W_{RMS}, 340 W_{MAX}
Mic input	5 mV/600 Ω
Line input	-
Aux input	350 mV/10 kΩ
Telephone input	1 V/10 kΩ
Speaker output	4-16 Ω, 70/100 V
Frequency range	50-16,000 Hz
Equalizer bass	±10 dB/100 Hz
Equalizer, treble	±10 dB/10 kHz
S/N ratio	66 dB (mic)
	80 dB (aux)
THD	< 0.5 %
Power supply	230 V/50 Hz/740 VA
Dimensions	430x88x380 mm, 2 RS
Weight	16.6 kg
Inputs	1 x 6.3 mm/XLR (combo)
	1 x 6.3 mm jack (mic 1)
	2 x 6.3 mm jack (mic 2-3)
	2 x RCA L/R (aux 1-2)
	screw terminals (telephone)
Outputs	2 x RCA L/R (line out)



PA-312

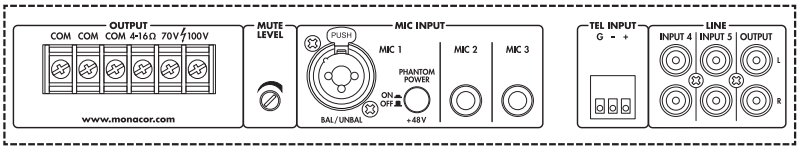
Order No. 17.3640

TABLE TOP UNIT | 482 mm 19" | 100V | 4Ω | 8Ω | 16Ω

Mono PA mixing amplifier

- 1 x 120 W_{RMS}
- Silent operation due to fanless cooling concept
- 3 microphone inputs, one of which is a balanced input
- Mic 1 with priority circuit and adjustable automatic talkover
- 2 aux inputs
- 1 telephone input for telephone systems with audio output
- Speaker outputs via screw terminals
- 1 line output
- Input and output level controls
- 2-way tone control for the output
- 48 V phantom power supply for channel 1, can be switched on additionally
- 482 mm (19") rack installation with supplied mounting brackets

Model	PA-312
Output power	120 W_{RMS}, 160 W_{MAX}
Mic input	5 mV/600 Ω
Line input	-
Aux input	350 mV/10 kΩ
Telephone input	1 V/10 kΩ
Speaker output	4-16 Ω, 70/100 V
Frequency range	50-16,000 Hz
Equalizer bass	±10 dB/100 Hz
Equalizer, treble	±10 dB/10 kHz
S/N ratio	66 dB (mic)
	80 dB (aux)
THD	< 0.5 %
Power supply	230 V/50 Hz/450 VA
Dimensions	430x88x335 mm, 2 RS
Weight	7.8 kg
Inputs	1 x 6.3 mm/XLR (combo)
	1 x 6.3 mm jack (mic 1)
	2 x 6.3 mm jack (mic 2-3)
	2 x RCA L/R (aux 1-2)
	screw terminals (telephone)
Outputs	2 x RCA L/R (line out)



100 V Mixing Amplifiers

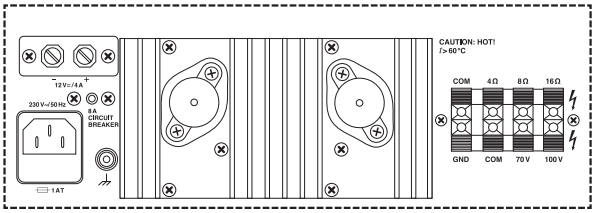
PA-888

Order No. 17.0430

TABLE TOP UNIT | 100V | 4Ω | 8Ω | 16Ω

Mono PA mixing amplifier

- 1 x 45 W_{RMS}
- Silent operation due to fanless cooling concept
- 2 microphone inputs, 1 aux input
- Chime, siren and fog horn, adjustable level
- Tone control
- 7-step LED level display
- Protective circuit with protection LED display
- Mains operation or 12 V battery operation



PA-702

Order No. 17.1330

TABLE TOP UNIT | 100V | 4Ω | 8Ω

Mono PA mixing amplifier

- 1 x 35 W_{RMS}
- Silent operation due to fanless cooling concept
- 2 low-impedance microphone inputs
- 1 aux input, 1 phono input, switchable
- Speaker outputs via spring-loaded terminals
- Input and output level controls
- 3-way equalizer for the output

- Connection for a microphone talk button to switch off the other sources during announcements
- Mains operation

PA-402

Order No. 17.1320

TABLE TOP UNIT | 100V | 4Ω | 8Ω

Mono PA mixing amplifier

- 1 x 20 W_{RMS}
- Silent operation due to fanless cooling concept
- 2 low-impedance microphone inputs, front input jacks
- 1 aux input, 1 phono input, switchable
- Speaker outputs via spring-loaded terminals
- Input and output level controls
- Tone control for the output
- Mains operation or 12 V battery operation

Model	PA-888	PA-702	PA-402
Output power	45 W_{RMS}, 100 W_{MAX}	35 W_{RMS}, 70 W_{MAX}	20 W_{RMS}, 40 W_{MAX}
Mic input	2.8 mV/10 kΩ	2 mV	3 mV
Aux input	40 mV/47 kΩ	150 mV	150 mV
Phono input	-	3 mV	3 mV
Speaker output	4/8/16 Ω, 70/100 V	4/8 Ω, 100 V	4/8 Ω, 100 V
Frequency range	40-20,000 Hz	65-16,000 Hz, ±3 dB	100-15,000 Hz, ±3 dB
Equalizer bass		±10 dB/150 Hz	-
Equalizer midrange	-15 dB/5 kHz	±10 dB/1 kHz	-
Equalizer treble		±10 dB/6 kHz	±10 dB/10 kHz
S/N ratio	> 55 dB	> 55 dB	> 55 dB
THD	< 2 %	< 2 %	< 2 %
Power supply	230 V~/50 Hz/150 VA or 12 V⎓/4 A	230 V~/50 Hz/92 VA	230 V~/50 Hz/47 VA
			12 V⎓/2.5 A
Admiss. ambient temp.	0-40 °C	0-40 °C	0-40 °C
Dimensions	280x100x280 mm	320x85x230 mm	320x85x230 mm
Weight	6.38 kg	4.5 kg	3.8 kg
Inputs			
Microphone	2 x 6.3 mm jack	2 x 6.3 mm jack	2 x 6.3 mm jack
Aux, phono	1 x 6.3 mm jack (aux)	1 x RCA L/R each	1 x RCA each

Portable Mixing Amplifiers, Microphone Amplifier

PA-302

Order No. 17.1270

Mono PA mixing amplifier, 20 W_{MAX}.
- 1 microphone input, 1 aux input
- 2 speaker outputs, switchable
- Built-in speaker
- Can also be operated as an intercom system
- Siren and fog horn, automatic fog horn
- Supplied with hand-held microphone
- 12/24 V battery operation, automatic switching

PA-100

Order No. 17.0040

Mono PA mixing amplifier, 10 W_{MAX}.
- 1 microphone input, 1 aux input
- Supplied with hand-held microphone
- Siren
- 12 V battery operation

Model	PA-302	PA-100
Output power	14 W_{RMS}, 20 W_{MAX}	6.5 W_{RMS}, 10 W_{MAX}
Mic input	3 mV	2 mV
Aux input	50 mV	100 mV
Output	4-16 Ω	4+8 Ω
Frequency range	20-20,000 Hz	130-24,000 Hz
S/N ratio	65 dB	65 dB
THD	< 0.5 %	< 3 %
Power supply	12-15 V⎓/2 A, 24 V⎓/1 A	12 V⎓/2 A
Admiss. ambient temp.	0-40 °C	0-40 °C
Dimensions	175x60x170 mm	150x40x145 mm
Weight	1.5 kg	1.2 kg
Inputs		
Mic	1 x 6.3 mm jack	1 x 5-pole DIN jack
Aux	1 x RCA	1 x 5-pole DIN jack
Outputs		
Speakers	2 x 2-pole plug-in screw terminal	1 x 5-pole jack
Ext. speaker	1 x 3-pole plug-in screw terminal with jumper	-
Power supply	1 x 2-pole plug-in screw terminal	1 x 5-pole jack

PAM-10

Order No. 17.0150

PA amplifier, with zone paging microphone.
- Integrated amplifier 10 W_{RMS}
- Talk button and volume control, speaker connection 4-16 Ω
- Power supply: 230 V~/50 Hz/12 VA
- Dimensions: 167x65x130 mm
- Mains operation

ICM-20

Order No. 17.3110

Intercom system, cable-connected, consisting of a desktop microphone and separate call station. Ideally suited e.g. for reception desks and sales desks.

Desktop microphone:
- 300 mm gooseneck, removable (XLR connection)
- Electret microphone cartridge, cardioid characteristic
- Built-in amplifier and speaker
- Volume control
- Push-to-talk button
- Power supply via supplied PSU
- Dimensions console housing: 115x65x170 mm

Call station:
- Built-in speaker and microphone
- Call button (buzzer)
- 3 m connection cable for connecting to a desktop microphone
- Supplied with mounting accessories for the attachment to glass panels
- Power supply via desktop microphone
- Dimensions: ø 85 mm x 35 mm

100 V Multi-channel Digital Amplifiers

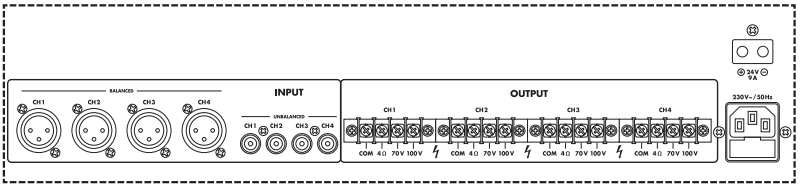
PA-1450D

482 mm 19" | 100 V | 4 Ω

Order No. 17.2950

4-channel digital PA amplifier

- 4 x 50 W_{RMS}
- Class D concept with a high efficiency to reduce energy costs
- Requires a lower rechargeable battery capacity for emergency power operation than 100 V analogue amplifiers
- Clearly reduced cooling requirements due to low heat loss
- Silent operation due to fanless cooling concept
- Mute function for each channel
- Level control for each channel
- LED indication for clip and protect for each channel pair
- Protected against short circuit
- Mains operation or 24 V emergency power operation



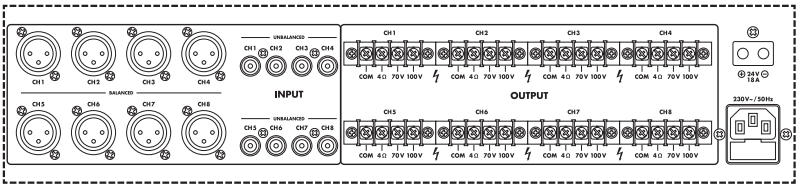
PA-1850D

482 mm 19" | 100 V | 4 Ω

Order No. 17.2960

8-channel digital PA amplifier

- 8 x 50 W_{RMS}
- Class D concept with a high efficiency to reduce energy costs
- Requires a lower rechargeable battery capacity for emergency power operation than 100 V analogue amplifiers
- Clearly reduced cooling requirements due to low heat loss
- Silent operation due to fanless cooling concept
- Mute function for each channel
- Level control for each channel
- LED indication for clip and protect for each channel pair
- Protected against short circuit
- Mains operation or 24 V emergency power operation



Model	PA-1450D	PA-1850D
Output power	4 x 50 W_{RMS}/100 V, 4 x 50 W_{RMS}/4 Ω	8 x 50 W_{RMS}/100 V, 8 x 50 W_{RMS}/4 Ω
Input sensitivity	1 V/20 kΩ unbal.	1 V/20 kΩ unbal.
	550 mV/20 kΩ bal.	550 mV/20 kΩ bal.
Speaker output	4 Ω, 70/100 V	4 Ω, 70/100 V
Frequency range	10-20,000 Hz	10-20,000 Hz
S/N ratio	63 dB	> 65 dB
THD	< 0.5 %	< 0.5 %
Admiss. ambient temp.	0-40 °C	0-40 °C
Power supply	230 V~/50 Hz/300 VA,	230 V~/50 Hz/600 VA,
	24 V⎓/9 A	24 V⎓/18 A
Dimensions	483x90x330 mm, 2 RS	483x90x330 mm, 2 RS
Weight	9.5 kg	12.7 kg
Connections		
Signal input	4 x XLR, bal.	8 x XLR, bal.
	4 x RCA	8 x RCA
Speaker output	screw terminals	screw terminals

100 V Multi-channel Power Amplifiers

PA-4240

Order No. 17.0820

PA-4120

Order No. 17.0810

482 mm 19" 100V

PA power amplifiers

- 4 x 240 W_{RMS} (PA-4240)
- 4 x 120 W_{RMS} (PA-4120)
- Routing switches for parallel operation on 2 channels each
- Temperature-controlled fan
- Connection for external on/off switch
- LED display for clip, protect, overtemperature and output level
- Mains operation or 24 V emergency power operation

Model	PA-4240	PA-4120
Output power	4 x 240 W_{RMS}	4 x 120 W_{RMS}
Input sensitivity	1.2 V, bal.	1.2 V, bal.
Output impedance	31 V/4 Ω, 50 V/10.4 Ω, 70 V/20 Ω, 100 V/42 Ω	22 V/4 Ω, 50 V/21 Ω, 70 V/41 Ω, 100 V/83 Ω
Frequency range	55-17,000 Hz, -3 dB	55-17,000 Hz, -3 dB
S/N ratio	> 90 dB, A-weighted	> 90 dB, A-weighted
THD	< 1 %	< 1 %
High-pass filter		
Admiss. ambient temp.	0-40 °C	0-40 °C
Power supply	230 V~/50 Hz/2,720 VA,	230 V~/50 Hz/1,400 VA,
	24 V⎓/113 A	24 V⎓/60 A
Dimensions	483x133x370 mm, 3 RS	483x133x370 mm, 3 RS
Weight	28 kg	25 kg
Connections		
Signal input	4 x XLR	4 x XLR
Speaker output	screw terminals	screw terminals
Other features		

PA-2240

Order No. 17.0800

482 mm 19" 100V

PA power amplifier

- 2 x 240 W_{RMS}
- Routing switch for parallel operation on both channels
- Switchable 400 Hz high-pass filter 6 dB/oct.
- Soft start
- Temperature-controlled fan
- LED display for clip, protect, overtemperature and output level
- Mains operation or 24 V emergency power operation

Model	PA-2240
Output power	2 x 240 W_{RMS}
Input sensitivity	1.2 V, bal.
Output impedance	25 V/2.6 Ω, 44 V/8 Ω, 70 V/20 Ω, 100 V/42 Ω
Frequency range	35-20,000 Hz, -3 dB
S/N ratio	> 100 dB, A-weighted
THD	< 1 %
High-pass filter	400 Hz, 6 dB/oct.
Admiss. ambient temp.	0-40 °C
Power supply	230 V~/50 Hz/1,300 VA,
	24 V⎓/55 A
Dimensions	483x88x374 mm, 2 RS
Weight	18 kg
Connections	
Signal input	2 x XLR / screw terminals
Speaker output	screw terminals
Other features	