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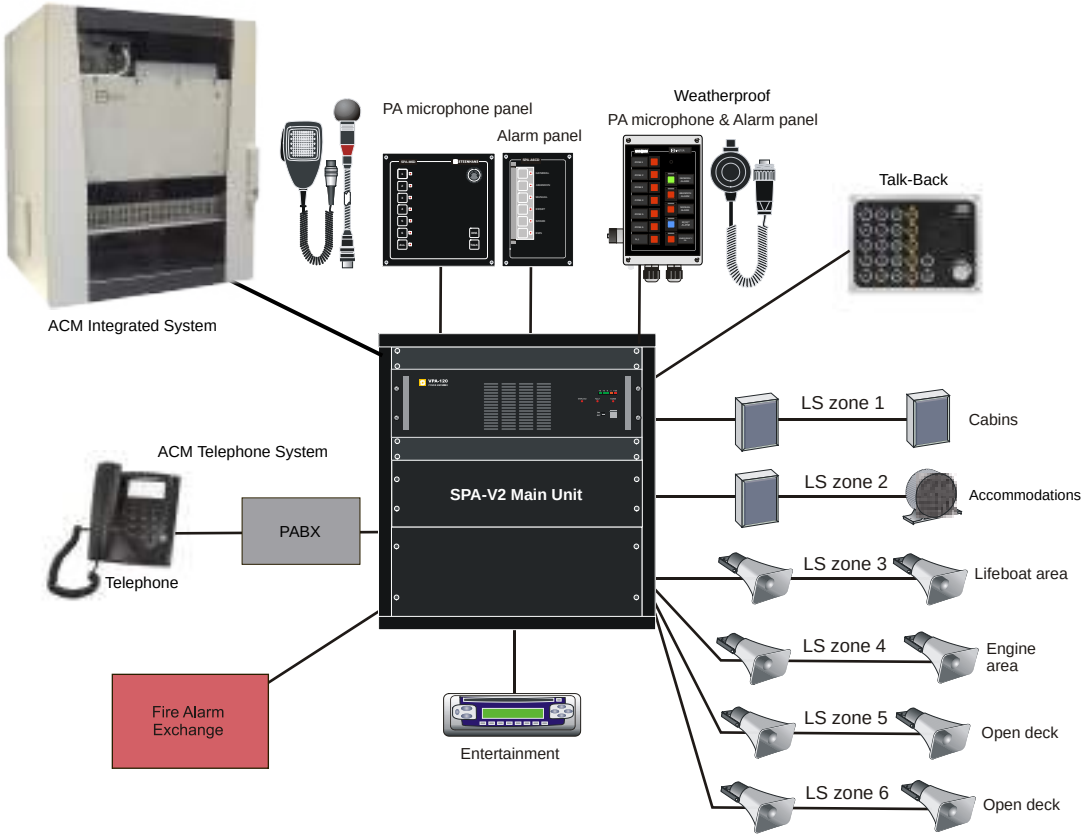

System Manual

Public Address & General Alarm System

SPA-V2

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1 Introduction

1.1 About this Document

The scope of this document is to provide relevant information on the system features, available equipment and technical data for the SPA-V2 Public Address & General Alarm System.

The information in this document is aimed at System Administrators, System Installers and End Users.

1.2 Publication Log

Rev.	Date	Author	Comments
1.0	2008-03-05	TH/JF	Published
2.1	2011-06-27	HKL	Revised text, panel figures, system types
3.0	2013-3-19	HKL	Volume controls, VM15, VM50
4.0	2016-9-05	SEN	Revised Access panels, etc.
4.1	2019-10-21	HKL	Phontech CIS Talk-Back
5.0	2020-3-4	HKL	EA1400, EA1600

1.3 Related Documents

Doc. no.	Documentation
A100K10370	SPA-V2 Configuration and Installation Manual
A100K10371	SPA-V2 User Manual
	Project documents, drawings and SPA schematics
	Outline drawings in AutoCAD
	Amplifier and Entertainment manuals

1.4 Rules and Regulations

The SPA-V2 Public Address and General Alarm System is designed to meet the requirements in accordance with SOLAS:

- Chapter III, part B, regulation 6.4 and 6.5
- MSC.48(66) – International Life-Saving Appliance (LSA) Code
- MSC/Circ.808 – Public Address for passenger vessels
- MSC A.830(19) – Code on Alarms and Indicators, 1995

The system also meets additional requirements from the following class societies:

DNV, GL, BV, LR, RS, CCS, RINA, and ABS.

The SPA-V2 system and its components have been tested according to the following regulations:

- **IEC 60533: Second edition, 1999**
  "Electrical and electronic installation in ships - Electromagnetic compatibility".
- **IEC 60945: Fourth edition, 2002**
  "Maritime navigation and radio communication equipment and systems - General requirements - Methods of testing and required test results".
- **IACS E10: Corr.1 July 2003**
  "Unified environmental test specification - Testing procedure for electric control and monitoring, safety and protection, onboard computer based systems and peripherals, loading instruments, internal communication and other electrical equipment as considered appropriate".

2 System Build-Up & Functions

2.1 General Description

The SPA series PA system is specially designed to meet the demands for a flexible and efficient public address system for use on board marine vessels and offshore installations.

The system is available in different versions and offers a set of standard and optional features that cover the requirements for a marine PA and General Alarm system.

One SPA rack can have wattages ranging from 120 W up to 2800 W with a maximum of 600 W per loop and 1800 W per zone. Combining several racks will increase the wattage considerably.

The main board with standard functions and terminals, optional function boards, amplifier(s) and entertainment source are normally housed in a 19” rack cabinet. The height of the rack may be from 12U to 40U in steps of 4U depending on the number of amplifiers and modules mounted.

Optionally, Zenitel may deliver system wiring and integration, testing, and documentation.

2.2 Standard Class and DNV Requirements

The system requirements are different for conventional and passenger vessels and for PA systems with or without General Alarm features.

Some features require optional boards connected to the main terminal board. These boards are mounted on DIN rails or in the lower part of the rack and interfaced to the terminal board by cables with plugs.

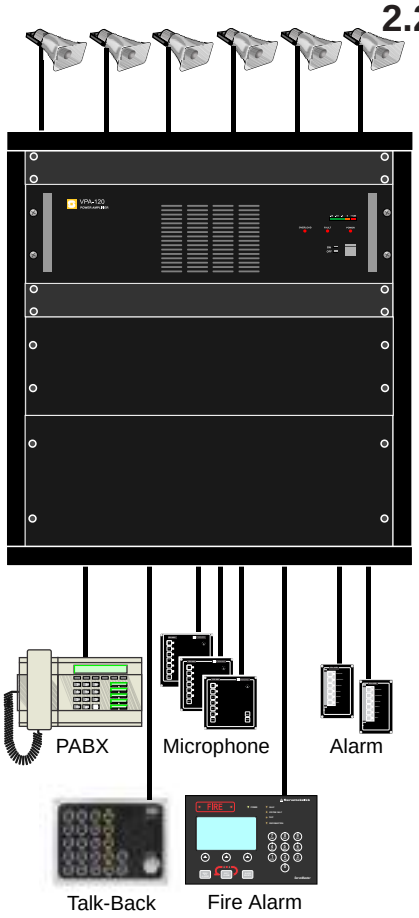
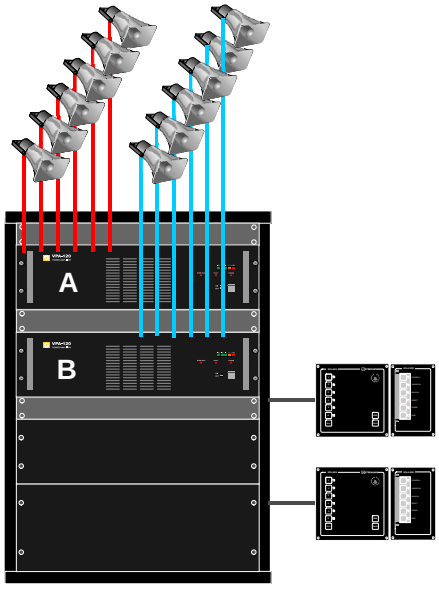


Figure 1 Typical basic PA configuration

2.2.1 Basic PA for Conventional Vessels

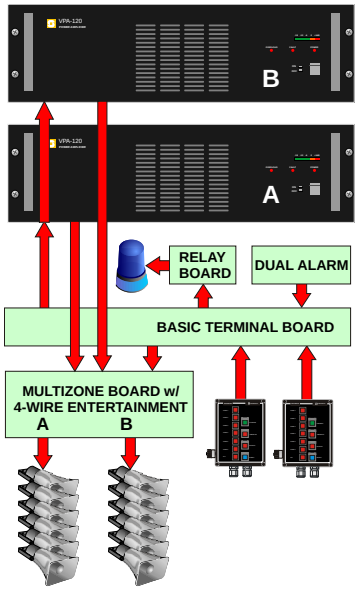
- 120 W, 240 W, 400 W standard or 400W, 600W class-D amplifiers with:
  - output level indication
  - overload protection and indication
  - master gain & tone controls (located on rear side)
- Mounted in a 19” rack
- Standard amplifiers are powered by 230 VAC or 110 VAC with automatic switch to 24 VDC backup power (UPS)
- Class-D amplifiers are powered by 230 VAC with automatic switch to 230 VAC backup power (110 / 110 VAC on request)
- Screw terminals for ship’s cable network (2.5 mm^2)
- Outputs for 6 loudspeaker zones, 100 V line
- Input for Command Talk-Back Systems
- Input for 3 microphone panels with priority
- PABX input with zone presets
- Alarm mute relay during PA message
- Predefined for up to 8 alarm panels (2 included & 6 optional) and alarm module
- Input for alarm start from fire exchange (with alarm generator installed) with distribution to specified zone



2.2.2 Optional Features

- Built-in radio / CD player
- Audio monitor and program selector panel
- Chime generator (ding-dong)
- Local entertainment (pubs, restaurants, canteens, etc.) & PA sub-systems
- Alarm signal generator with alternative alarm signal configurations
- Power failure output
- Two independent loudspeaker loops (A and B) for each zone
- PABX voice recorder
- PA message recorder
- Switch between 230VAC mains to 230VAC UPS (or 110VAC to 110VAC)
  - Note: 230 / 230 VAC switching standard for EA amplifiers

Figure 2 Basic requirements, conventional vessels (non-DNV)

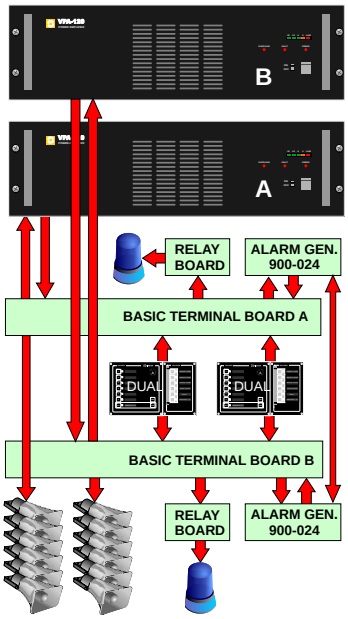


2.2.3 Basic PA & GA for Conventional Vessels

Basic requirements (non-DNV, minimum configuration)

- Same basic features as for PA listed in section 2.2.1
- Standard requirements are two separate identical alarm generators which can be mounted in one rack (main/backup)
- There is one Terminal Board (SPA-TERM-V2) with a dual Alarm Generator (SPA-EE3D-V2) and a multi-zone board with 4-wire entertainment facility (SPA-MUL-V2)
- Minimum two amplifiers share the same basic terminal board (SPA-TERM-V2)
- Minimum two Alarm panels are required
- External alarm warning equipment can be connected to an Alarm Relay Board with three potential free relay contacts (SPA-AL-REL-V2)

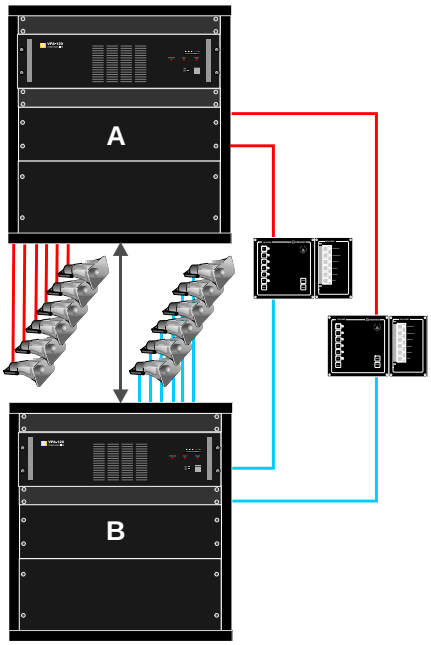
Figure 3 Basic requirements, conventional vessels (non-DNV)



DNV 2005 requirement and later (minimum configuration)

- Conventional vessels require two separate systems in parallel to be used for General Alarm (2 x SPA-TERM-V2)
- The systems are mounted in the same rack and each zone has loudspeakers from both systems connected to a multi-zone board with 4-wire entertainment facility (SPA-MUL-V2)
- Minimum one amplifier is connected to each of the terminal boards
- Two Dual Alarm Panels are connected to the Terminal Boards
- External alarm warning equipment can be connected to SPA Alarm Relay Boards which have three potential free relay contacts (SPA-AL-REL-V2)

Figure 4 Basic requirements, conventional vessels (DNV)



2.2.4 Basic PA & GA for Passenger Vessels

- Same basic features as for PA listed in sections 2.2.1 and 2.2.2.
- Passenger vessels require two identical separate racks in different fire zones:
  - both systems operate in parallel
  - if one system fails, the other will still work.
- There must be separate loudspeaker loops from each amplifier:
  - the loops must have different physical routings.
- Requires two single interconnected alarm generators:
  - one in each system.
- Requires minimum two dual microphone and alarm panels:
  - each panel serves both systems.
  - if one panel fails, the other will still work.
  - each panel has 2 control boards for A & B systems.

Figure 5 Basic PA & GA for passenger vessels

2.3 System Overview

2.3.1 General

The central PA unit has a number of audio inputs, signal inputs, audio outputs, and audio controllers.

2.3.2 Priority

All audio inputs are given a priority with standard configuration:

- Optional Talk Back input	Priority 1
- 3 x microphone panels	Priority 2-4
- PABX audio	Priority 5
- Alarm panels	Priority 6 (optional higher priority)
- Entertainment source	Priority 7

From the above, it means that in standard configuration, a call from a microphone panel will override an ongoing alarm signal. This can be accepted for installations in which all PA panels are to be used in locations intended for Emergency PA usage (bridge, next to life boats, etc.).

However, in installations in which there are PA panels to be used in locations not intended for Emergency PA usage (like restaurants, bars, receptions, etc.), the GA/Alarm priority should be heightened to 3 or 4, and non-emergency PA panels should be configured on the input connectors of lower priority.

Alarms (GA) can be changed upwards to priority 3-5 by using jumpers on the basic terminal board – see section 2.8 in the *SPA Configuration and Installation Manual*.

2.3.3 Zones

There are six 100 V loudspeaker zones to e.g. cabins, accommodations, corridors, outdoor areas, life boat areas, engine areas.

- PA microphone panels can select zones 1-6 or all zones
- PABX telephone zones can be preset with jumpers on the basic terminal board for zones 1 to 6
- Alarm and microphone panels can be set to one, two or more of the six zones or all zones.
- Entertainment distribution can be restricted to pre-selected zones.
- Only fire crew can have zone set in default version of system.

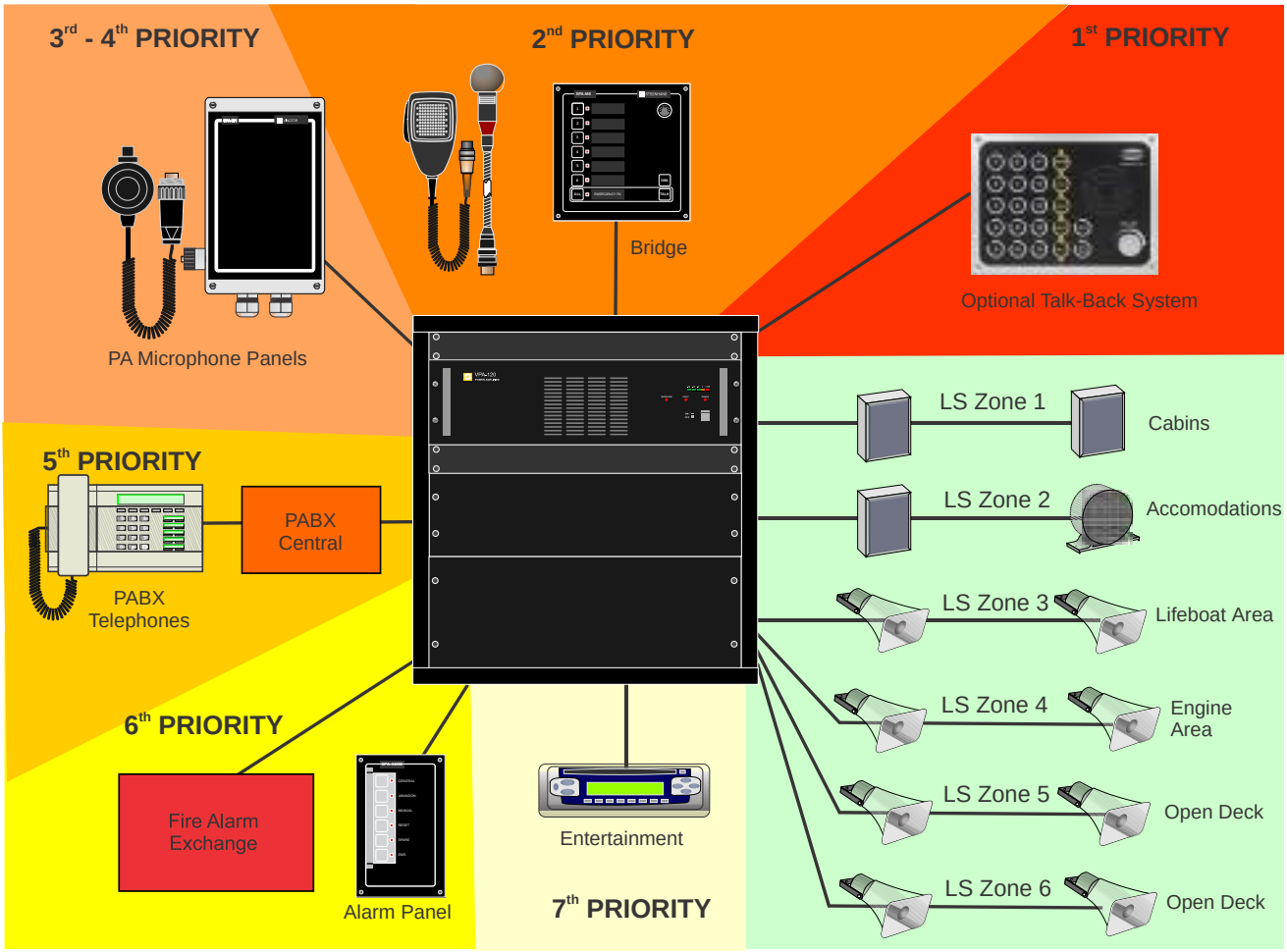


Figure 6 SPA-V2 System Overview

2.3.4 Talk-Back Panel Input

The Talk-Back panel is optional. There is input in the system which makes the Talk-Back panel connection to have the highest priority. When the system is used as PAGA, this input shall not be regarded as part of the system.

2.3.5 Panels for Alternative Priorities in SPA-V2

Optional 1st priority Mic Bridge panel in Talk-Back system

- CIS P-3130 Talk-Back Station

2nd - 4th priorities Microphone panels and combined microphone / alarm panels in the SPA-V2 system

Microphone panels:

- SPA-M1-V2 & SPA-M1-D
- SPA-M6-V2 & SPA-M6-D

Combined microphone/alarm panels:

- SPA-W1-V2 & SPA-W1-D
- SPA-W1AR-V2 & SPA-W1AR-D
- SPA-W6A4 & SPA-W6A4-D

5th priority Phones in PBX system

6th priority Alarm panels of SPA-V2

- SPA-AC6 and SPA-AC6-D

7th priority Entertainment system

3 System Overview & Types

3.1 System Type Name

- The type name comprises three parts separated by a hyphen (-) where the first is always **SPA** and the third is **V2**
- The second part indicates the power of the included amplifier. The possibilities are:
  - VPA-120 (120W @ 100V)
  - VPA-240 (240W @ 100V)
  - VPA-400 (400W @ 100V)
  - EA1400 (class-D 400W @ 100V)
  - EA1600 (class-D 600W @ 100V)

  ⓘ *Note that any additional amplifier can be any of the above options.*

- Options may be required to fulfill requirements for your vessel. These will be listed as separate items on the order. Please see the table below for more details.
  - Note that some items include rack expansion, while some, e.g. amplifier, need to add this separately. Please refer to product catalog for details.
- 1 HU = 1.75” = 44.45 mm
  - Only racks with heights up to 24 HU are approved by DNV to be used as PA & PA/GA systems
  - When two racks are required, it will be indicated

Standard SPA-V2 rack configurations

	Commercial vessel Basic PA	Commercial vessel PA/GA	Passenger vessel PA/GA
12 HU 1 Amplifier	**Main Rack** SPA-xxx-V2 Includes 1x 12 HU RACK 1x SPA-TERM-V2 1x DR-4524 1x VPA-120/VPA-240/VPA-400/EA1400/EA1600	**N/A**	**Main Racks** 2x SPA-120-V2 Includes 2x 12 HU RACK 2x SPA-TERM-V2 2x DR-4524 2x VPA-120/VPA-240/VPA-400/EA1400/EA1600 **Options required** 2x SPA-EE3-V2
	Entertainment option SPA-ENT4-V2	**N/A**	**Entertainment option** 2x SPA-ENT4-V2
	AUX alarm option SPA-EE3-V2	**N/A**	**N/A**
16 HU 2 Amplifiers	**Main Rack** SPA-xxx-V2 **Options required** 1x SPA-MUL-V2 1x VPA-120/VPA-240/VPA-400/EA1400/EA1600 1x SPA-EXPW	**Main Rack** SPA-xxx-V2 **Options required** 1x SPA-EE3D-V2 1x SPA-MUL-V2 1x VPA-120/VPA-240/VPA-400/EA1400/EA1600 1x SPA-EXPW (+4HU)	**Main Racks** 2x SPA-120-V2 **Options required** 2x SPA-EE3-V2 2x SPA-MUL-V2 2x VPA-120/VPA-240/VPA-400/EA1400/EA1600 2x SPA-EXPW
20 HU 3 Amplifiers	**Main Rack** SPA-xxx-V2 **Options required** 1x SPA-MUL-V2 2x VPA-120/VPA-240/VPA-400/EA1400/EA1600 2x SPA-EXPW	**Main Rack** SPA-xxx-V2 **Options required** 1x SPA-EE3D-V2 1x SPA-MUL-V2 2x VPA-120/VPA-240/VPA-400/EA1400/EA1600 2x SPA-EXPW	**Main Racks** 2x SPA-120-V2 Options required 2x SPA-EE3-V2 2x SPA-MUL-V2 3x VPA-120/VPA-240/VPA-400/EA1400/EA1600 3x SPA-EXPW

24 HU 4 Amplifiers	**Main Rack** SPA-xxx-V2 **Options required** 1x SPA-MUL-V2 3x VPA-120/VPA-240/VPA-400/EA1400/EA1600 3x SPA-EXPW	**Main Rack** SPA-xxx-V2 **Options required** 1x SPA-EE3D-V2 1x SPA-MUL-V2 3x VPA-120/VPA-240/VPA-400/EA1400/EA1600 3x SPA-EXPW	**Main Racks** 2x SPA-120-V2 **Options required** 2x SPA-EE3-V2 2x SPA-MUL-V2 4x VPA-120/VPA-240/VPA-400/EA1400/EA1600 4x SPA-EXPW
30 HU 5 Amplifiers	**Main Rack** SPA-xxx-V2 **Options required** 1x SPA-MUL-V2 4x VPA-120/VPA-240/VPA-400/EA1400/EA1600 4x SPA-EXPW	**Main Rack** SPA-xxx-V2 **Options required** 1x SPA-EE3D-V2 1x SPA-MUL-V2 4x VPA-120/VPA-240/VPA-400/EA1400/EA1600 4x SPA-EXPW	**Main Racks** 2x SPA-120-V2 **Options required** 2x SPA-EE3-V2 2x SPA-MUL-V2 5x VPA-120/VPA-240/VPA-400/EA1400/EA1600 5x SPA-EXPW
40 HU 6 Amplifiers	**Main Rack** SPA-xxx-V2 **Options required** 1x SPA-MUL-V2 5x VPA-120/VPA-240/VPA-400/EA1400/EA1600 5x SPA-EXPW	**Main Rack** SPA-xxx-V2 **Options required** 1x SPA-EE3D-V2 1x SPA-MUL-V2 5x VPA-120/VPA-240/VPA-400/EA1400/EA1600 5x SPA-EXPW	**Main Racks** 2x SPA-120-V2 **Options required** 2x SPA-EE3-V2 2x SPA-MUL-V2 6x VPA-120/VPA-240/VPA-400/EA1400/EA1600 6x SPA-EXPW
	N/A	**Alarm Output option** SPA-AL-REL-V2 (GA only) SPA-AL-REL6-V2 (GA/Abandon/Fire)	**Alarm Output option** 2x SPA-AL-REL-V2 (GA only) 2x SPA-AL-REL6-V2 (GA/Abandon/Fire)

ⓘ *Further options are available and listed elsewhere*

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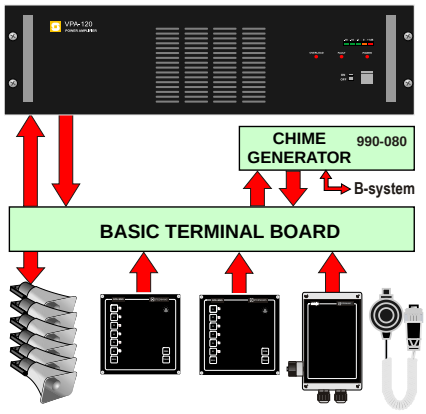
3.2 Standard Basic PA Functions

These functions are included on the Basic Terminal Board and do not require any additional function boards.

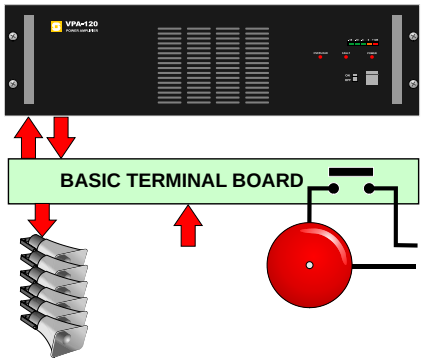
3.2.1 PA Microphone Panel Functions



- There are 3 PA Microphone Panel inputs as standard.
- The panels will have priority 2, 3 and 4 according to input.
- The panels are made for different use and locations.
- Manual or preset selection of any of the 6 zones or all zones.
- With or without alarm function.
- Gooseneck or handheld microphone.
- For flush or bulkhead mounting (WP is also available)

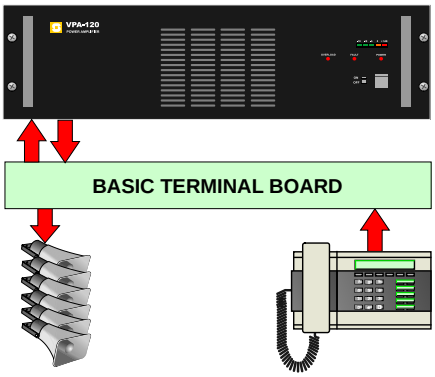
Figure 7 PA microphone panel functions

3.2.2 Alarm Mute



- For muting of external alarm sound equipment when PA message is broadcasted or for muting of loudspeaker which may cause feedback to PA microphone.
  - Integrated relay on terminal board (X5)

Figure 8 Alarm Mute function



3.2.3 PABX Functions

- Telephone and intercom requirements:
  - 0 dB output
  - Potential-free contact to talk
- Dial a PA access number and give a message from the telephone or intercom system.
  - Zone selection by jumpers

Figure 9 PABX functions

3.3 Optional Functions

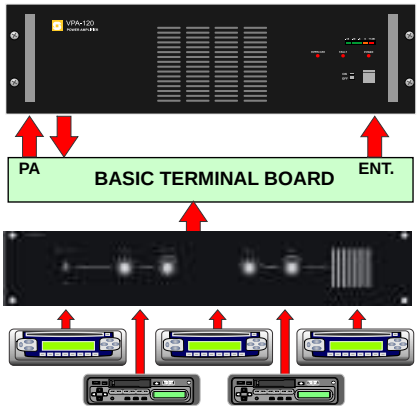
These functions require an additional function board connected to the basic terminal board.

Functions are defined according to project requirements.

Function boards are mounted, internal connections are made and straps are set.

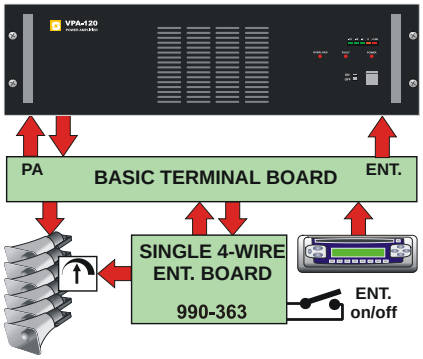
3.3.1 Entertainment - Basic

Figure 10 Basic entertainment functionality



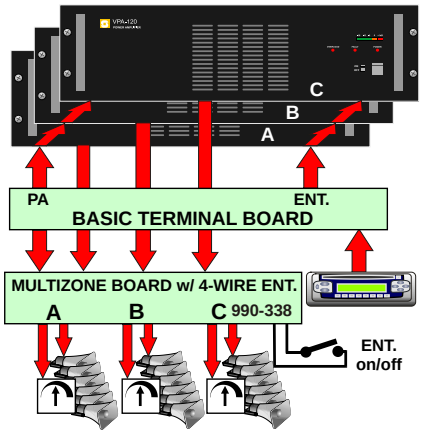
- The Basic Terminal Board has one entertainment source input
- The input can be used for one single entertainment source or an optional monitor panel with selector for 5 sources and monitor loudspeaker with volume control
- A selection of program sources mounted in a 19” panel is available:
  - Radio/Cassette player
  - Radio/CD player
- Optional boards for 3-wire or 4-wire systems in single or multi amplifier racks must be connected to the termination board to enable:
  - preset zone selection
  - turning entertainment on/off
  - PA and/or emergency volume override

3.3.2 Entertainment - 4-Wire, Single Amplifier



- The single 4-wire entertainment board (SPA-ENT4-V2 / PCB 990-363) must be mounted
- Output for volume override relay in local volume controls
- Entertainment to pre-selected zones is set by jumpers on the entertainment board or the termination board (part of SPA-xxx-V2)
- Entertainment can be turned on/off by a switch in front of rack.
- Jumper for selection of emergency or normal volume override

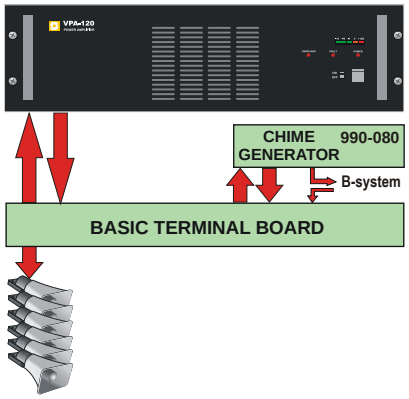
Figure 11 Entertainment, single amplifier, 4-wire override



3.3.3 Entertainment - 4-Wire, Multi Amplifiers

- The multi-zone board with 4-wire entertainment facility (SPA-MUL-V2 / PCB 990-338) must be mounted
- Output for volume override relay in local volume controls
- Designed for up to 6 x 3 amplifiers
- Entertainment to pre-selected zones is set by jumpers on the entertainment board (SPA-ENT4-V2 / SPA-MUL-V2) or the termination board (SPA-TERM-V2)
- Entertainment can be turned on/off by a switch in front of rack.
- Jumper for selection of emergency or normal override

Figure 12 Entertainment, multiple amplifiers, 4-wire override



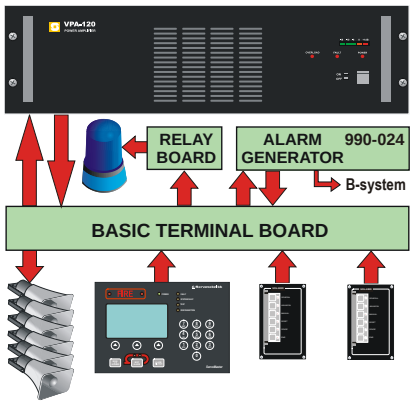
3.3.4 Chime Generator

- "Ding-dong" before PA message from microphone panels
  - Two tones
- The VPA amplifier has a built-in Chime Generator.
  - This can be used in systems with only one amplifier
- The Chime Generator Board (SPA-CHIME4-V2) must be mounted:
  - if more than one amplifier is mounted in parallel
  - if amplifiers are connected as A-B system
  - if one ore more amplifiers are used
- One module serves both A and B system

Figure 13 Chime generator board

3.3.5 Alarm Basic & Alarm Dual

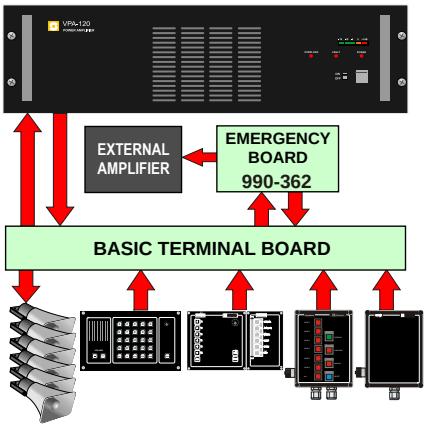
Figure 14 Alarm generator board



- 2 inputs for alarm panels
- 2 inputs for external fire alarm contacts
- An Alarm Generator Board must be mounted
  - SPA-EE3-V2 (990-024) with three priority controlled alarm tones
  - Interface to trigger another standby Alarm Generator Board in a dual system
- Alternatively, a Dual Alarm Generator Board (SPA-EE3D-V2, PCB 990-362) can be fitted for redundancy at alarm generation function
- Output for external alarm warning equipment through Relay Board SPA-AL-REL-V2 with three potential free relay contacts:
  - General alarm, steady
  - General alarm, pulsing
  - General alarm, pulsing with mute

When flashing lights are connected to the SPA-AL-REL-V2, this functionality/lights should be tested at installation/commissioning.

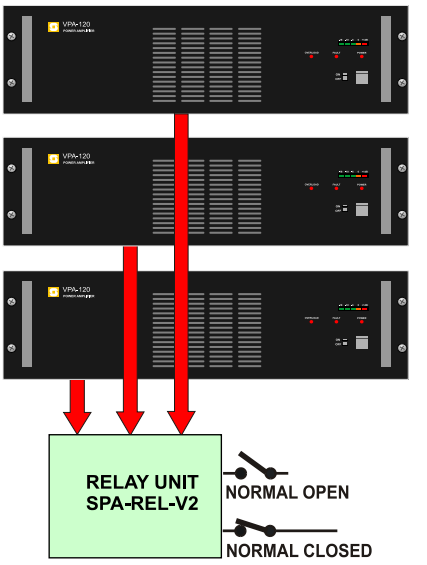
- Output for external alarm warning equipment through Relay Board SPA-AL-REL6-V2 with three potential free relay contacts:
  - General alarm, steady
  - General alarm, pulsing
  - General alarm, pulsing with mute
  - Manual steady
  - Abandon steady



3.3.6 External Emergency PA Output

- There are two possible ways to broadcast an emergency message with 1st priority
  - Microphone Panels with combined All Call/Emergency PA button
  - Alarm Panels combined with microphone panels with separate Emergency PA button
- Emergency PA overrides alarm and volume control setting
- The SPA-EMS-V2 board (PCB 990-362) must be mounted when message and alarm is going to be broadcasted via external system.

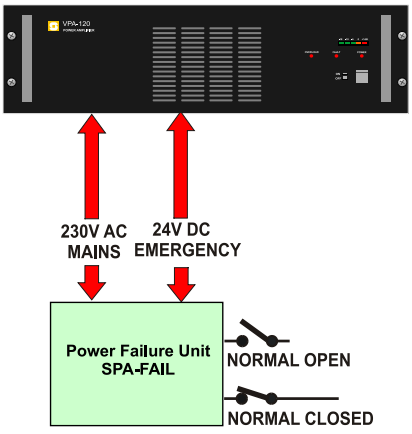
Figure 15 External Emergency PA Output board



3.3.7 Amplifier Monitor

- A Line Control Module is integrated in the VPA amplifier to check the correct operation of the amplifier.
  - Amplifier performance, 23 kHz in/out check
  - 100V loudspeaker line connection check
  - Line overload (shorted line) check
- There are *FAULT* and *OVERLOAD* indicators on the VPA amplifier front
- There are *Fault* and *Line Error* indicators on the EA amplifier front
- Normal operation and detected faults in all amplifiers may be indicated by LEDs on a panel in the 19” rack
- A remote fault indicator may be connected via a fault indicator interface unit type SPA-REL-V2
- For amplifier power monitoring, an additional relay per amplifier is required

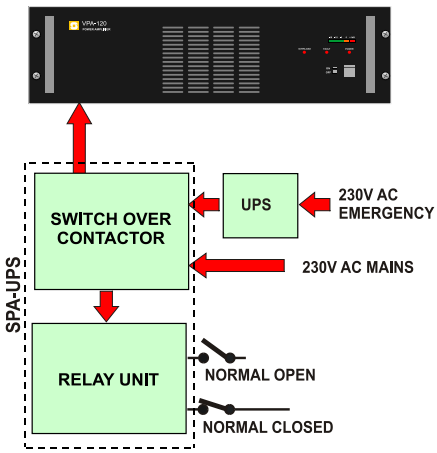
Figure 16 External Emergency PA Output board



3.3.8 Power Failure Control 1

- Amplifiers operate normally from 230 VAC power supply
- The VPA amplifiers operate from 24 VDC emergency if 230 VAC fails.
- The EA amplifiers operate from 230 VAC emergency if 230 VAC fails.
- Power failure unit type SPA-FAIL can be installed for activation of external warning

Figure 17 Power fail-over to 24 VDC



3.3.9 Power Failure Control 2

- Amplifiers operate normally from 230 VAC power supply
- Amplifiers can operate from 230 VAC emergency, supplied from an uninterruptible power supply (UPS) if 230 V mains fail.
- SPA-UPS comes with power failure outputs

Figure 18 Power fail-over to 230 VAC

4 Rack & Equipment

4.1 Cabinets

The cabinets are standard 19” racks with heights from 12 to 40 module units (U) depending on the number of amplifiers, entertainment sources, monitors, and other modules in the actual installation.

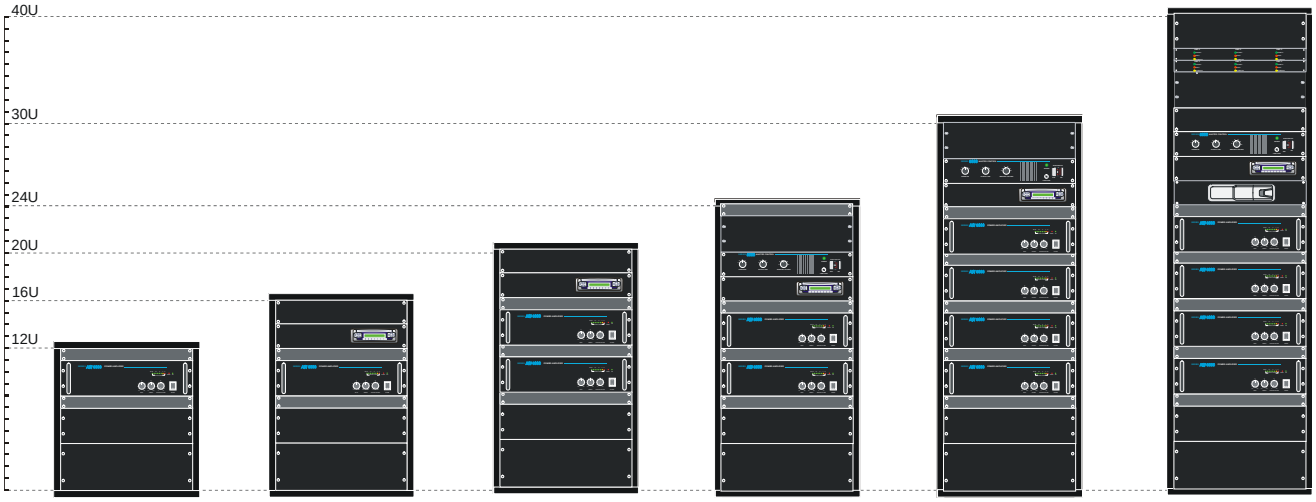


Figure 19 Available cabinet height options (1U = 1.75” = 44.5 mm)

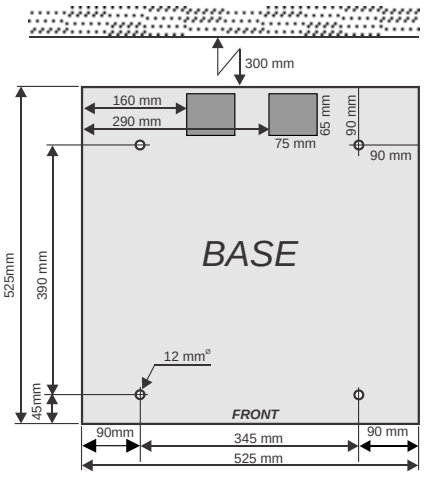


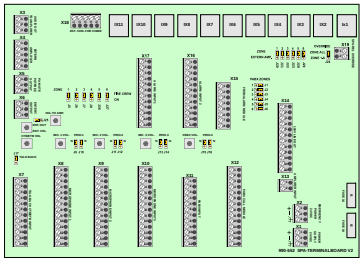
Figure 20 Cabinet base measurements

- Cable inlets should be realized through the rear of the cabinet.
  - The two 75 x 65 mm slots at the rear of the base are NOT recommended for cable inlets.
- The rack should be mounted at least 300 mm from the wall for cable inlets.

Technical data

Material:	Black painted steel	
Height:	12U	586 mm
	16U	764 mm
	20U	942 mm
	24U	1119 mm
	30U (not type approved/certified)	1386 mm
	40U (not type approved/certified)	1831 mm
Width:	All	525 mm
Depth:	All	525 mm
Temperature range:	Ambient	-15^{O} to +55^{O}C
Relative humidity:	Non-condensing	10 to 90 %

4.2 Terminal Board



- The Terminal Board (SPA-TERM-V2) acts as an interface between the amplifier(s), external equipment and function boards.
- The board contains
  - electronic switching circuits
  - pluggable screw terminals for microphone and alarm panels, PABX exchange, entertainment source, alarm equipment, loudspeakers and power sources
  - RJ45 contacts for interface to function boards
  - separate volume controls for all audio inputs
  - zone and priority configuration jumpers
- The Terminal Board is mounted inside the cabinet and accessed by removing the front bottom cover plate(s).

4.2.1 Connecting Equipment

All external equipment is connected to the Terminal Board via pluggable screw terminals.

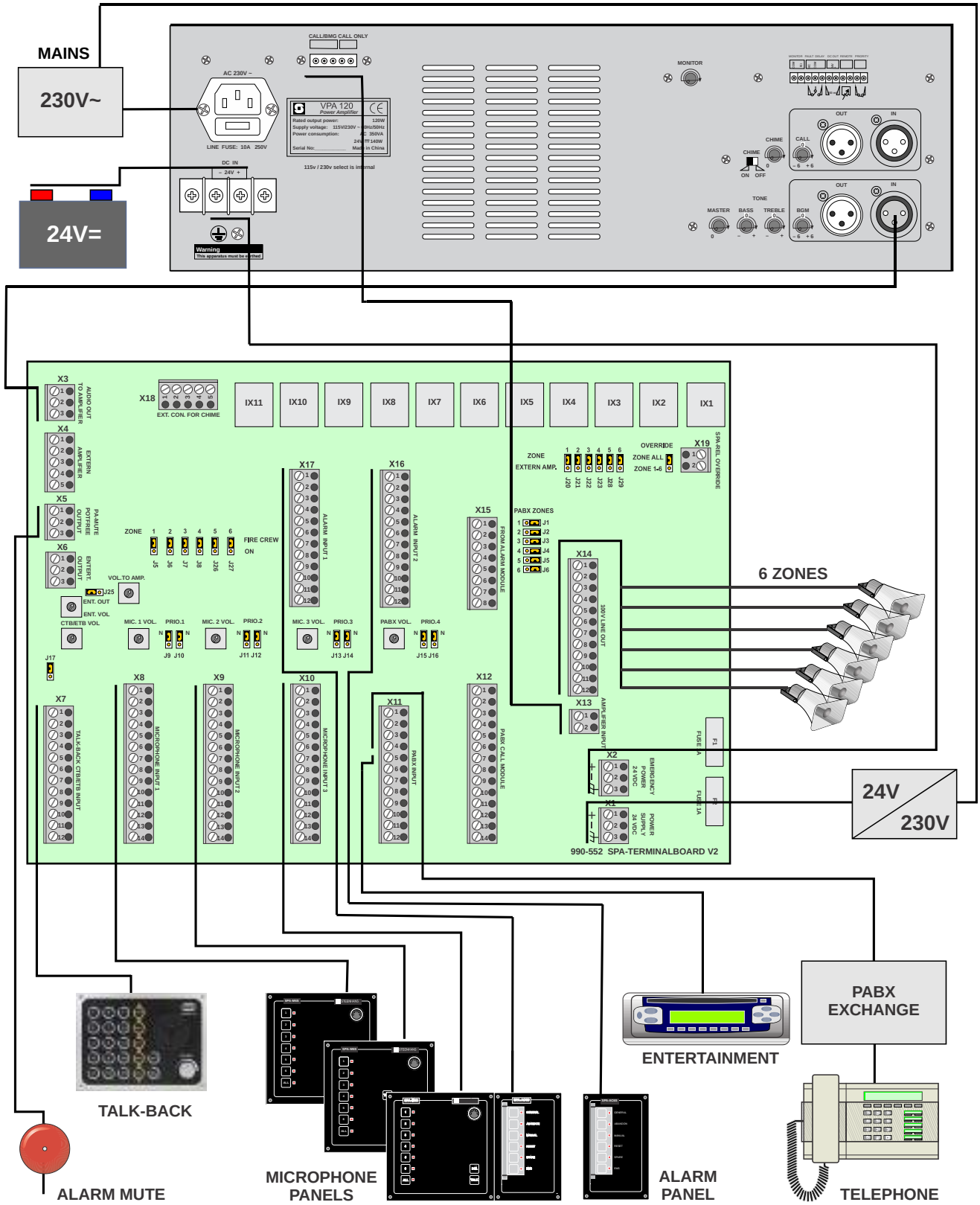


Figure 21 Basic connections to terminal board with VPA Amplifier

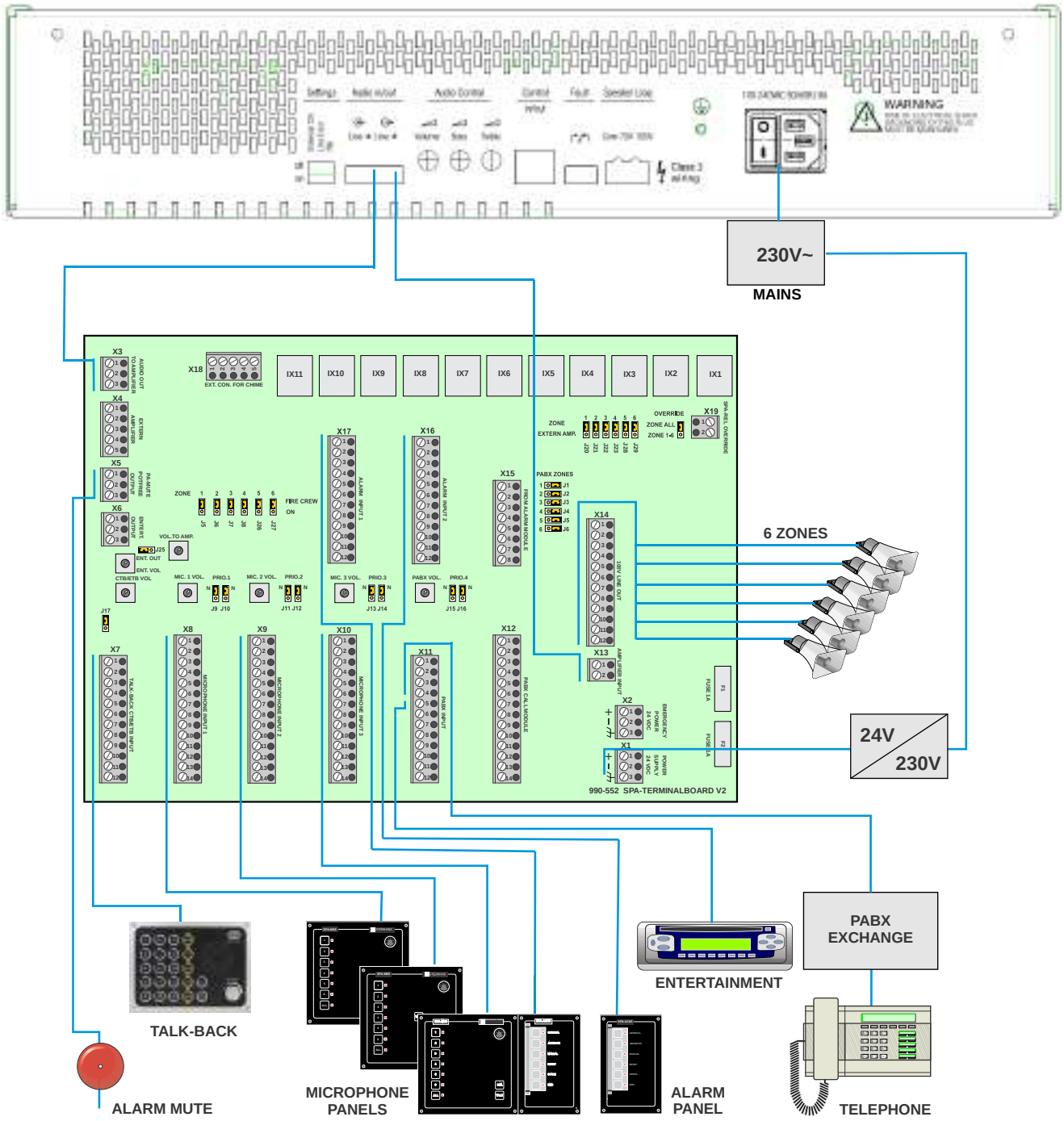


Figure 22 Basic connections to terminal board with EA Amplifier

4.2.2 Equipment Connectors

Cables from the panels and other equipment must be terminated in pluggable screw terminals and plugged into the corresponding pin plugs on the Terminal Board.

The cables are fixed under strain reliefs at the bottom of the board.

Shielded cables are earthed either at earthed screw terminals or at the shield terminal on the plug.

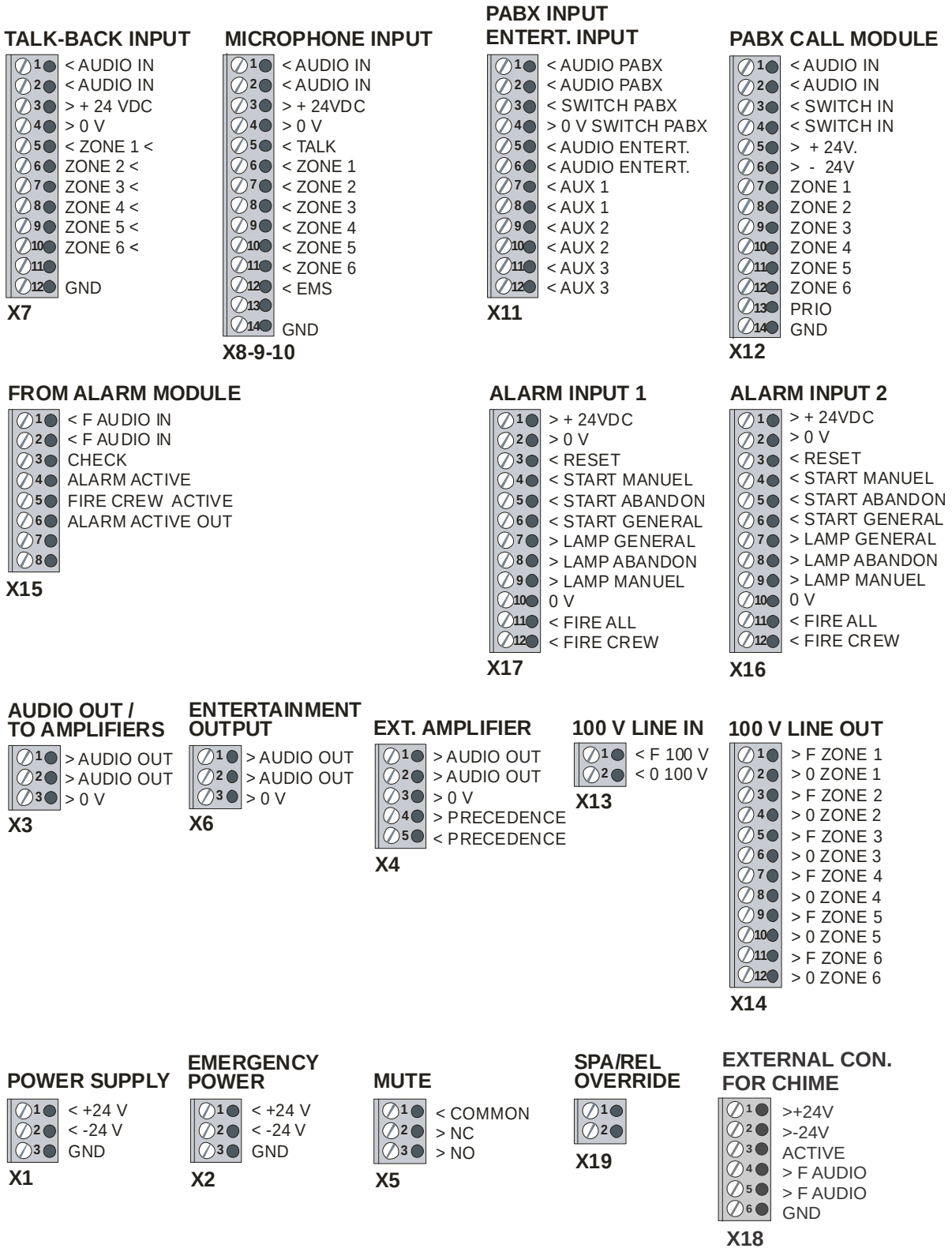


Figure 23 Terminal board connectors

4.2.3 Jumpers

The Terminal Board has a number of jumper configurations for routing the audio, determining some priorities, selecting zones, and handling emergency calls.

The jumpers are normally set according to project specifications at delivery, but may be changed if modifications are needed after installation.

Note that some function boards have jumpers that need to be set.

See the *SPA-V2 Configuration & Installation* manual for jumper settings.

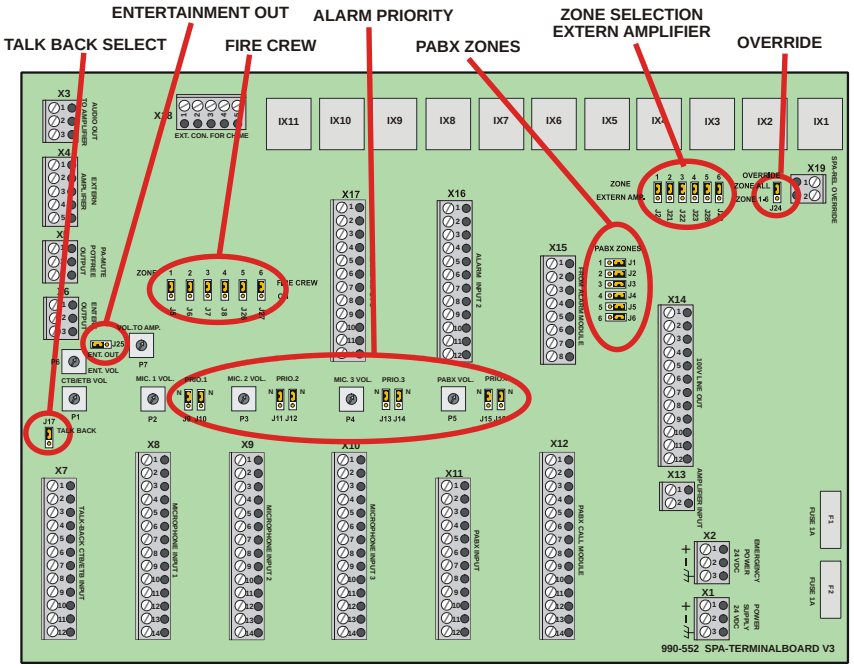


Figure 24 Terminal board Jumper placements

4.2.4 Volume Controls

The Terminal Board has a number of separate volume controls for adjusting all audio inputs. The volume controls are normally adjusted according to project specifications, but may be changed if modifications are needed after installation.

See the *SPA-V2 Configuration & Installation* manual for volume adjustments.

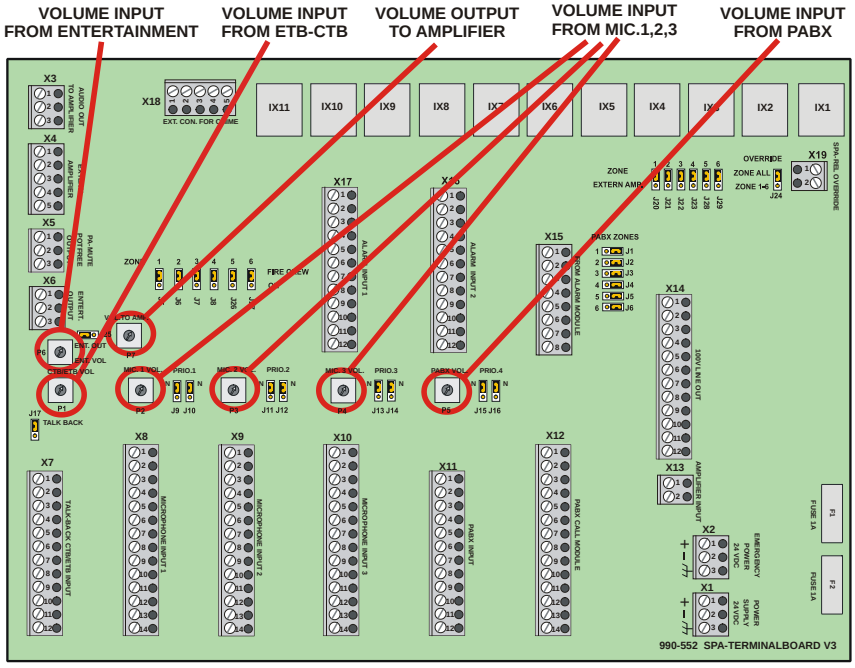


Figure 25 Terminal board Volume control placements

4.3 Function Boards

Function boards must be connected via cables to RJ45 contacts on the basic terminal board to attain certain system functions.

These boards are mounted in the rack cabinet and wired from the factory according to functions required by the customer.

Some boards contain straps to configure performance. These straps are factory set according to project specifications.

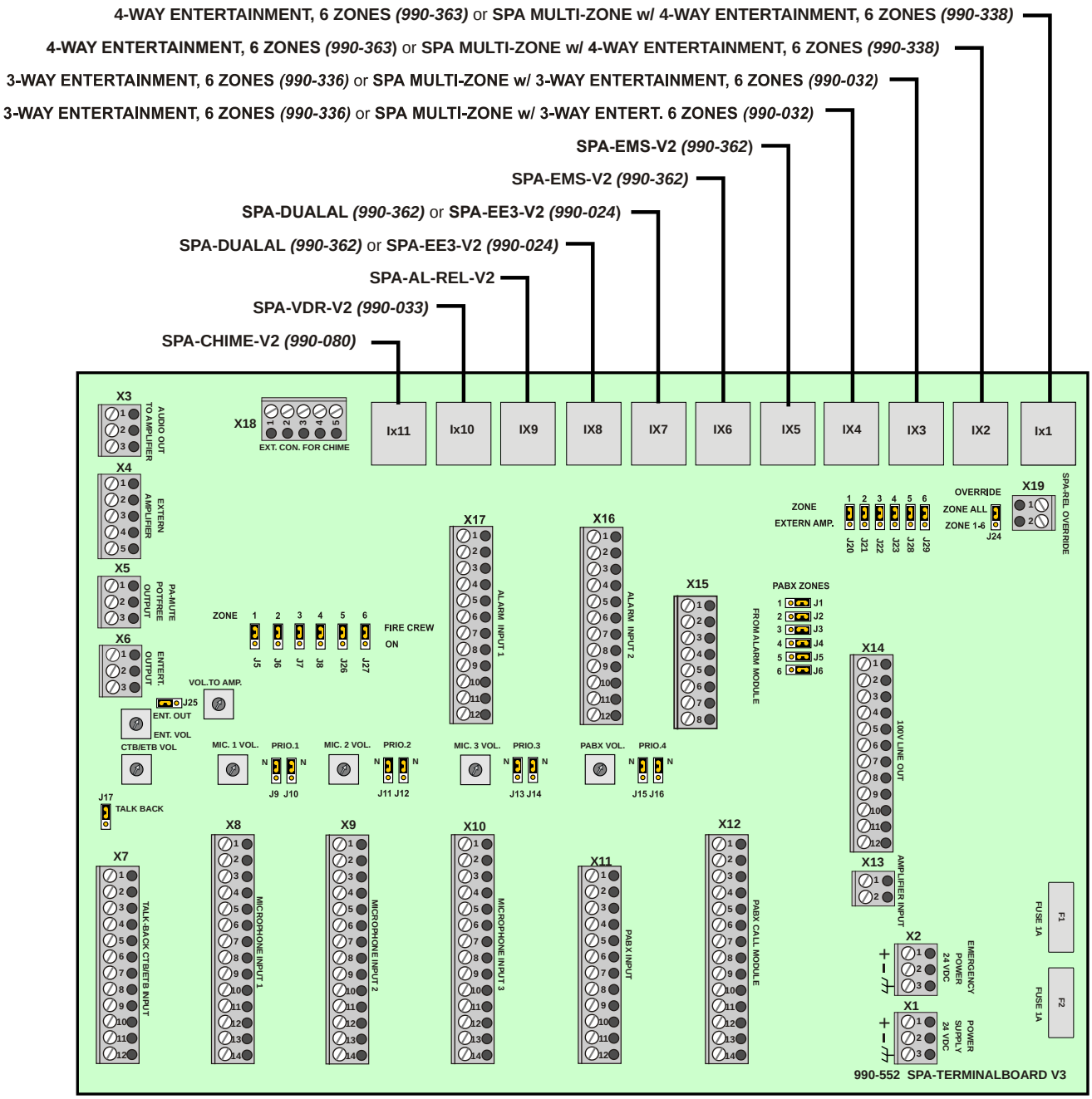
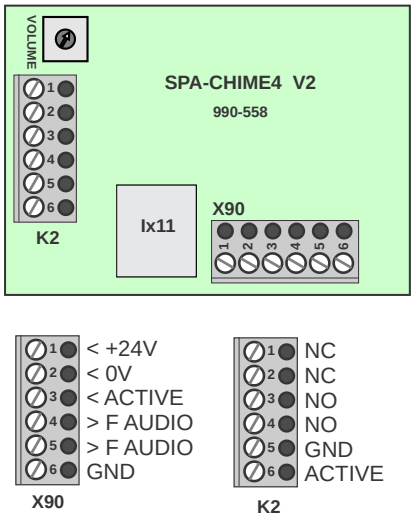


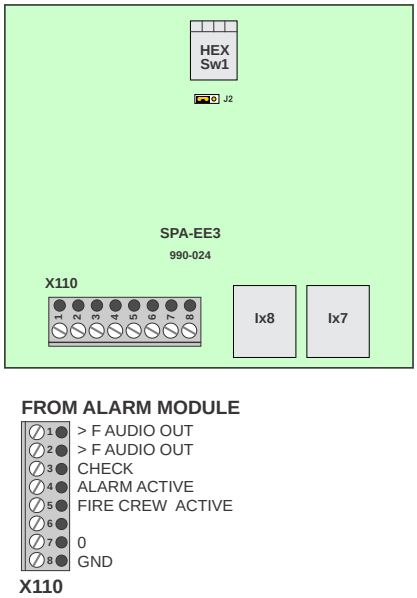
Figure 26 Terminal board, function board connections



4.3.1 SPA-CHIME4-V2

- Will give a dual tone “ding-dong” before PA message
- Adjustable volume and tone
- Adjustable tone, 3x different tones
- One board may serve both A and B system
- 24V and “Active” inputs are fused
- Interconnections to terminal board by RJ45 8-pin plug
- Pluggable screw terminals for external connections.

Figure 27 SPA-CHIME4-v2 board & connectors



4.3.2 SPA-EE3-V2

- The on-board microprocessor administers the alarm tones, inputs, and outputs.
- A selector marked HEXSW1 sets all the required configurations of alarm tones.
- The module has three start inputs and three outputs for relay or lamps
- Standard Alarm settings
  - 1st Priority: general alarm: 7 short and 1 long tone, 1kHz
  - 2nd Priority: abandon ship alarm: Wobbling tone, approx. 1kHz
  - 3rd Priority: manual alarm: Continuous tone, 1 kHz
- Interconnections to main terminal board via RJ45 plugs
- Pluggable screw terminals for external connections

Figure 28 SPA-EE3-v2 board & connectors

4.3.3 SPA-EE3D-V2

- Comprising 2x SPA-EE3-V2 and 1x SPA-DUALAL-V2.12 module
- Distribution of alarm signals in A-B system
- Contacts for alarm failure, normal open / normal closed
- Jumper for setting slave or master
-
- Standard Alarm settings
  - 1st Priority: general alarm: 7 short and 1 long tone, 1kHz
  - 2nd Priority: abandon ship alarm: Wobbling tone, approx. 1kHz
  - 3rd Priority: manual alarm: Continuous tone, 1 kHz
- Interconnections to main terminal board via RJ45 plugs
- Pluggable screw terminals for external connections

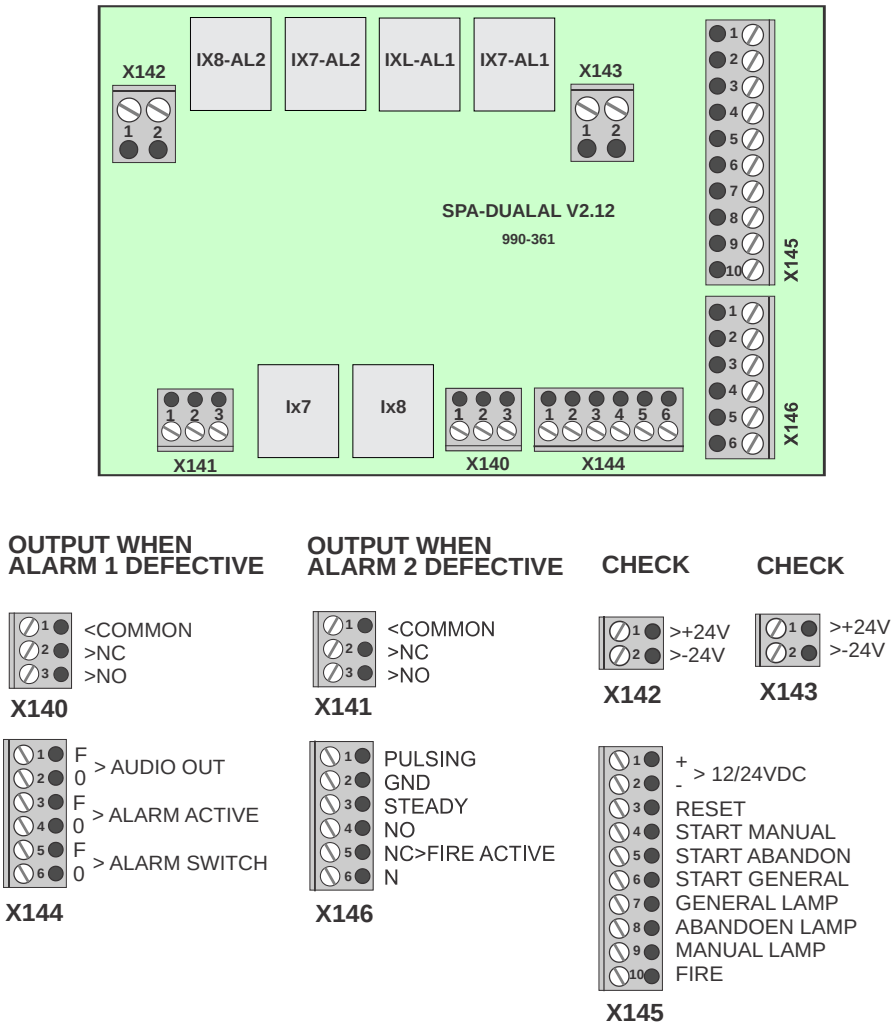
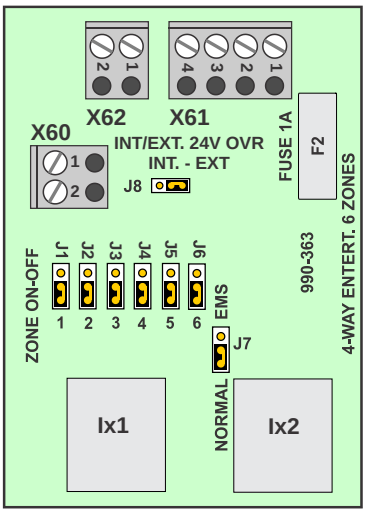


Figure 29 SPA-EE3D-V2 board & connectors



4.3.4 SPA-ENT4-V2

- Board for configuration to entertainment zones with 24V override.
- Internal or external 24V override.
- Fused 24 VDC inputs
- Entertainment to pre-select zones with jumpers
- Normal or Emergency override is set with jumper J7
  - EMS switch is activated from the PA panel.
- Terminal for connecting On/Off switch.
- Volume controls with 24V relay must be used
- Interconnections (Ix1 & Ix2) to main terminal board via RJ45 8-pin plug
- Pluggable screw terminals for external connections

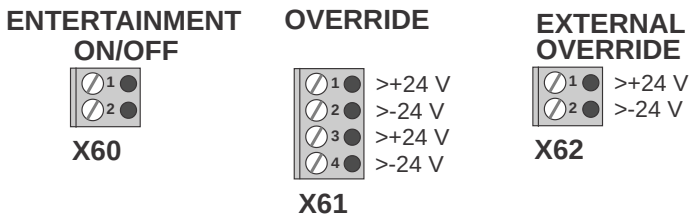


Figure 30 SPA-ENT4-v2 board & connectors

4.3.5 SPA-MUL-V2

- Zone distribution board for more than one amplifier
- Up to 3 amplifiers per zone
- Internal or external 24V override for entertainment.
- Fused 24VDC
- Entertainment to pre-selected zones set by jumpers
- Normal or Emergency override is set with a jumper.
  - EMS switch is activated from the PA panel.
- Interconnections to main terminal board via RJ45 8-pin plug
- Pluggable screw terminals for external connections.

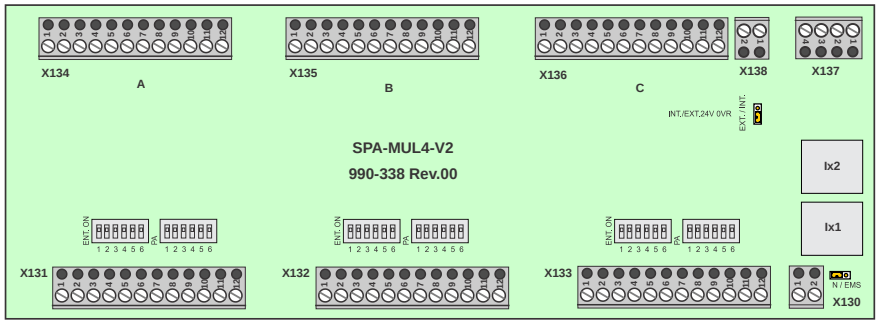
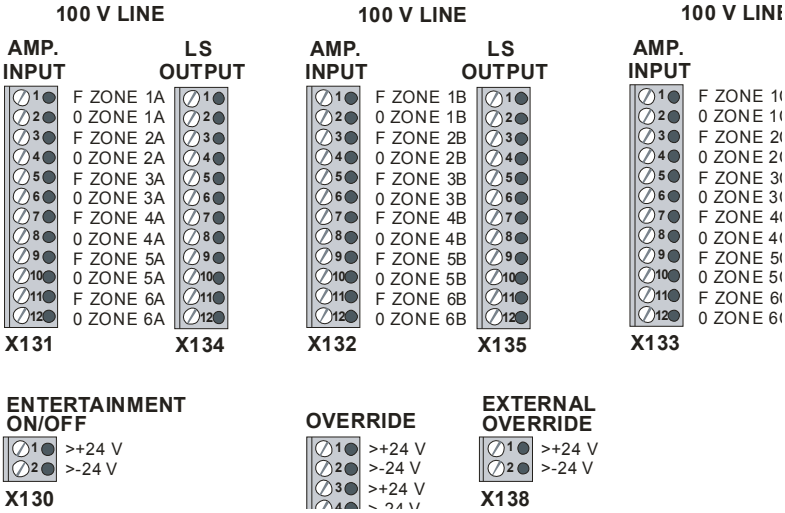
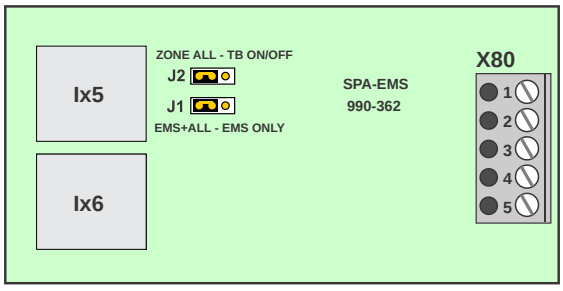


Figure 31 SPA-MUL4-V2 board & connectors



4.3.6 SPA-EMS-V2

- Switching board for emergency PA message and alarm to external system
- Inputs from All Call Talk-Back, Alarm and All Call microphone panels.
- Configuration settings via jumpers.
- Interconnections to main terminal board via RJ45 8-pin plug
- Pluggable screw terminals for external connections.



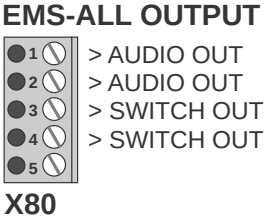
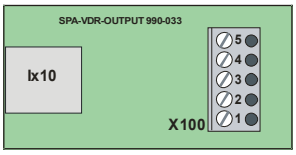


Figure 32 SPA-EMS v2 board & connectors



4.3.7 SPA-VDR-V2

- Output to voice data recorder system
- 0 dB and switch for all PA or alarm activities
- Interconnections to main terminal board via RJ45 8-pin plug
- Pluggable screw terminals for external connections

VDR- OUTPUT

1 > AUDIO OUT
2 > AUDIO OUT
3 > SWITCH OUT
4 > SWITCH OUT
5

X100

Figure 33 SPA-VDR-V2 board & connectors

4.4 VPA & EA Amplifiers

The SPA system includes one or more amplifiers mounted in 19” racks/ cabinets.

The VPA and EA series of amplifiers are specially designed for the SPA system and used as standard.

The amplifier types available are:

- VPA-120, 120 W
- VPA-240, 240 W
- VPA-400, 400 W
- EA-1400, 400 W
- EA-1600, 600 W

The units are designed for 19” rack assembly.

4.4.1 VPA Amplifier Front Panel

1 – Overload warning

2 – Fault warning

3 – VU meter, -18, -10, -6, 0, +1 dB

4 – Mains switch

5 – Power-on lamp

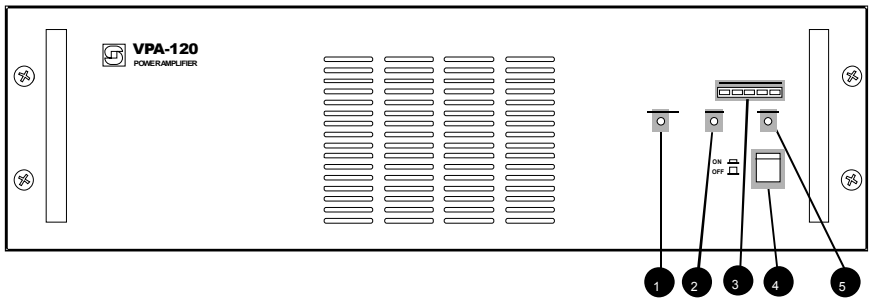


Figure 34 VPA amplifier schematic front panel

4.4.2 VPA Amplifier Rear Panel

6 - 24 VDC backup power (when connected, power is always ON)

7 - Frame ground connection

8 - Mains power plug and fuse

9 - Loudspeaker connections

10 - Pre-warning chime signal control

11 - Master volume control

12 - Master tone controls

13 - Entertainment input and output with volume preset

14 - PA/alarm audio input and output with volume preset

15 - 8 ohm monitor loudspeaker output with volume control

16 - NO/NC relay for amplifier fault warning

17 - 24 VDC 800 mA power to terminal board

18 - Remote volume control

19 - Priority over entertainment input

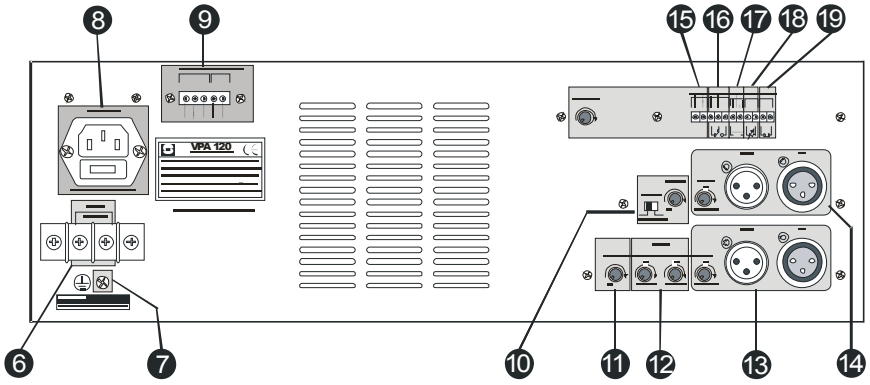


Figure 35 VPA amplifier schematic rear panel

4.4.3 EA Amplifier Front Panel

Figure 36 EA amplifier schematic front panel

4.4.4 EA Amplifier Rear Panel

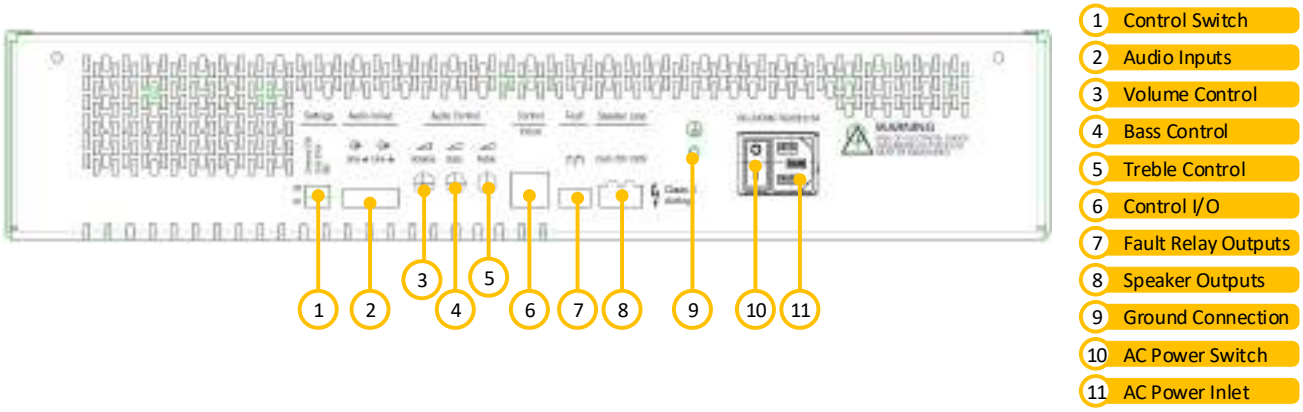
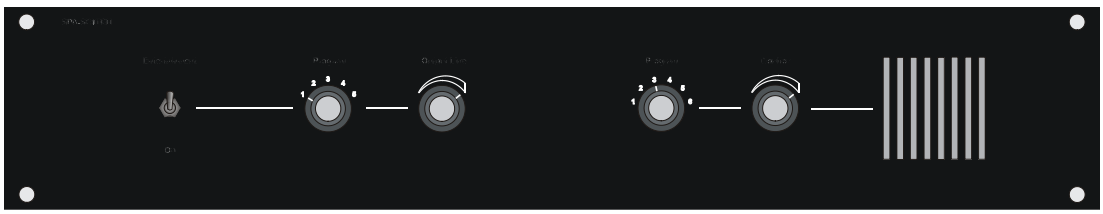


Figure 37 EA amplifier schematic rear panel

4.5 Optional Function Equipment

4.5.1 SPA-SWITCH-V2

Monitor with volume line selector and program switch 1-5.



- Monitor/control unit for entertainment and PABX inputs.
- Main switch for turning entertainment on/off
- Entertainment selector 1-5 program input
- Volume for adjustment of line output signal
- Amplifier selector and volume control for monitoring up to six amplifiers
- Dimensions: 19” 2HU, front mounting

4.5.2 SPA-PABXR-V2

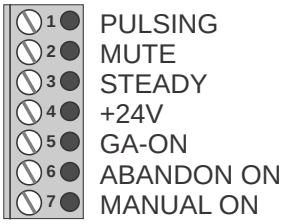
PABX recall voice recorder

- Recall voice recorder for PABX interface
- Using DTMF tone from PABX
- Up to 6 different zones or All can be given
- Including 1U rack expansion

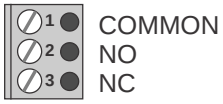
4.5.3 SPA-AL-REL-V2

Relay module with 3 potential-free outputs.

- General Alarm steady
- General Alarm pulsing
- General Alarm pulsing with PA mute

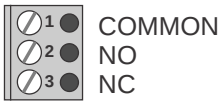


GA OUTPUT PULSING



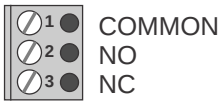
X163

MUTE BY GA OUTPUT PULSING



X162

GA OUTPUT STEADY

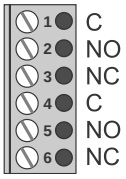


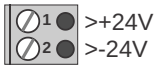
X161

4.5.4 SPA-REL-V2

Multipurpose relay module with potential-free relay contact.

- Rail mounting NS-35
- 230V AC or 24V DC, 6A
- Input Coil is 24V DC

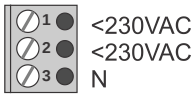




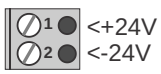
4.5.5 SPA-FAIL

Power failure output module with potential free relay contact.

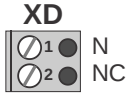
- Rail mounting NS-35
- 230V AC or 24V DC, 6A

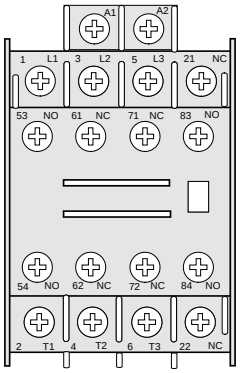


XE



XD





4.5.6 SPA-UPS

Autoswitch contact between 230V AC mains and emergency power or UPS

- Output for power failure
- 230V AC 50/60Hz
- 70 x 45mm
- Rail mounting NS-35
- Other voltages are available on request

4.5.7 PROMAX-120-24

Power Supply 230VAC/24VDC, 5A

- DIN Mounted additional power supply for rack equipment
- Over-load and short-circuit protected
- DNV-GL approved

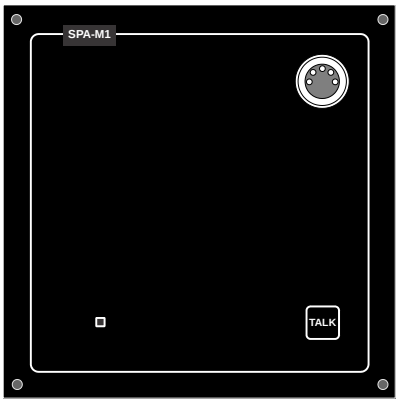
4.5.8 PROMAX-240-24

Power supply 100-240VAC/24VDC 10A

- DIN Mounted additional power supply for rack equipment
- Over-load and short-circuit protected
- DNV-GL approved

For Mounting & Installation instructions, see *SPA-V2 Configuration and Installation manual*.

5.1 PA & Alarm Panels



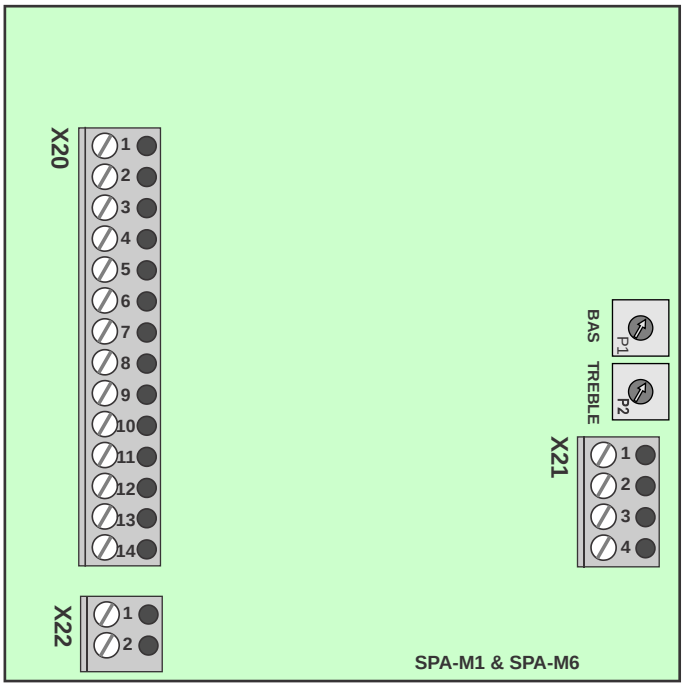
5.1.1 SPA-M1-V2

Single PA panel, all call for indoor use.

- For gooseneck mic MB-30G or handheld mic ETC-1-TB
- Built-in pre-amplifier with preset signal level and separate BASS & TREBLE controls.
- TALK button
- Flush mounting, backbox for wall mounting is available
- Local Mute (from hardware version 4.0)

Technical data

Material:	Black anodized aluminum
Front:	Graphic front film
Mounting:	Wall with 4x4 mm screws
Dimensions:	144W x 144H x 82D mm
Cabling:	Pluggable screw terminals, max 2.5 mm2 cable
Cable glands:	2 x PG-16
Weight:	0.3 Kg (with microphone 0.5 Kg)
Protection:	IP44



MICROPHONE INPUT

1	< AUDIO IN
2	< AUDIO IN
3	> + 24VDC
4	> 0 V
5	< TALK
6	< ZONE 1
7	< ZONE 2
8	< ZONE 3
9	< ZONE 4
10	< ZONE 5
11	< ZONE 6
12	< EMS
13	
14	GND

X20

1	0V
2	EMS INPUT
3	PWM INPUT
4	+5V

X21

1	> + 24VDC
2	> 0 V

X22 LOCAL MUTE

Figure 38 Board & Connectors for PA panels SPA-M1-V2

5.1.2 SPA-M1-D

Dual PA panel, all call for indoor use.

- For gooseneck mic MB-30G or handheld mic ETC-1-TB
- Built-in pre-amplifier with preset signal level and tone controls.
- Two independent control boards for dual PA systems (A-B systems)
- TALK button
- Flush mounting, backbox for wall mounting is available
- Local Mute (from hardware version 4.0)

Technical data

Material:	Black anodized aluminum
Front:	Graphic front film
Mounting:	Wall with 4x4 mm screws
Dimensions:	144W x 144H x 82D mm
Cabling:	Pluggable screw terminals, max 2.5 mm2 cable
Cable glands:	2 x PG-16
Weight:	0.3 Kg (with microphone 0.5 Kg)
Protection:	IP44

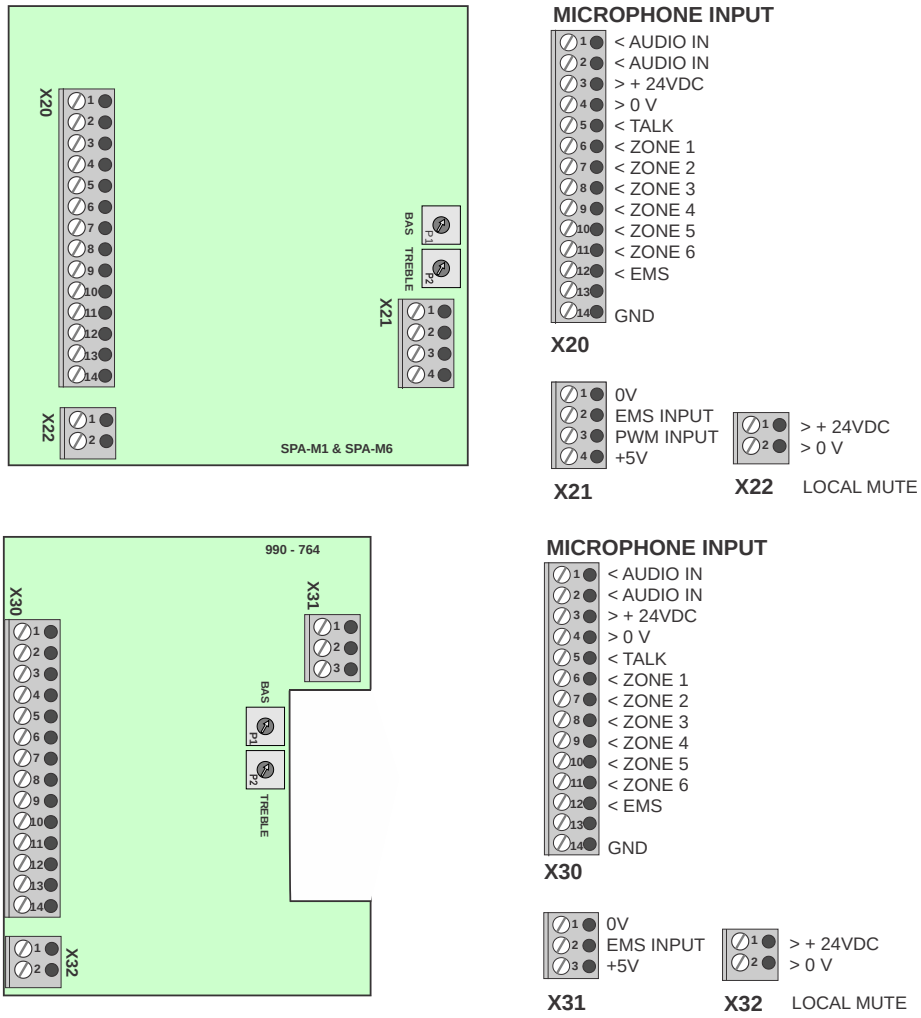
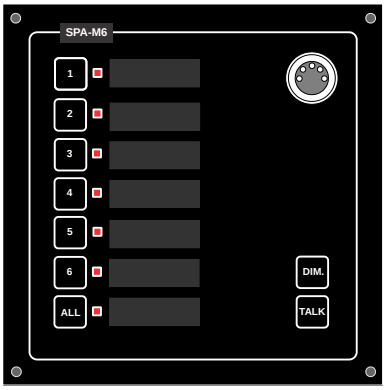


Figure 39 Board & Connectors for PA panels SPA-M1-D

5.1.3 SPA-M6-V2

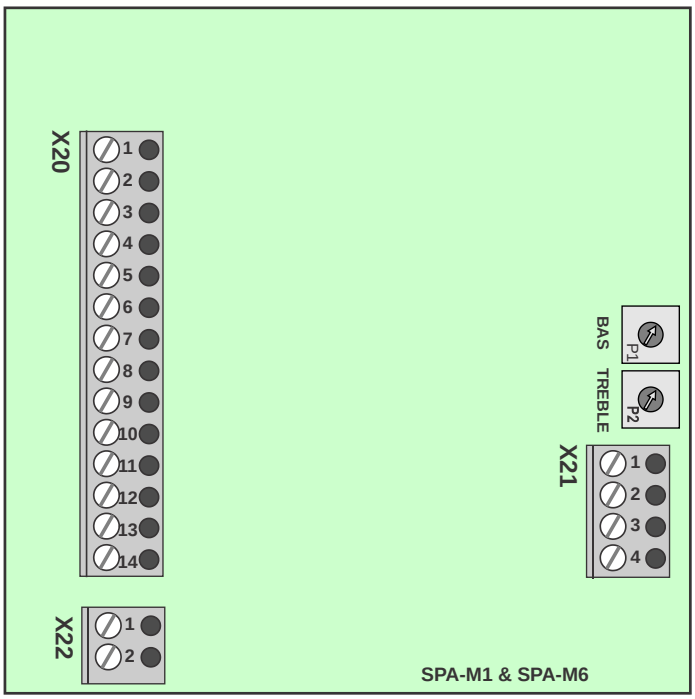


Single PA panel, 6 zones, all call and dimmer for indoor use.

- For gooseneck mic MB-30G or handheld mic ETC-1-TB
- Built-in pre-amplifier with preset signal level and tone controls.
- 6 zones selection buttons
- ALL, TALK, DIMMER buttons
- Replaceable text label for each zone button
- Zone buttons have activation LED.
- Flush mounting, backbox for wall mounting is available
- Local Mute (from hardware version 4.0)

Technical data

Material:	Black anodized aluminum
Front:	Graphic front film
Mounting:	Wall with 4x4 mm screws
Dimensions:	144W x 144H x 82D mm
Cabling:	Pluggable screw terminals, max 2.5 mm2 cable
Cable glands:	2 x PG-16
Weight:	0.3 Kg (with microphone 0.5 Kg)
Protection:	IP44



MICROPHONE INPUT

1	< AUDIO IN
2	< AUDIO IN
3	> + 24VDC
4	> 0 V
5	< TALK
6	< ZONE 1
7	< ZONE 2
8	< ZONE 3
9	< ZONE 4
10	< ZONE 5
11	< ZONE 6
12	< EMS
13	
14	GND

X20

1	0V
2	EMS INPUT
3	PWM INPUT
4	+5V

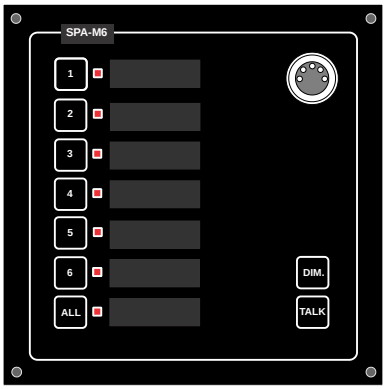
X21

1	> + 24VDC
2	> 0 V

X22 LOCAL MUTE

Figure 40 Board & Connectors for PA panels SPA-M6-V2

5.1.4 SPA-M6-D



Dual PA panel, 6 zones, all call and dimmer for indoor use.

- For gooseneck mic MB-30G or handheld mic ETC-1-TB
- Two independent control boards for dual PA systems (A-B systems)
- 6 zones selection buttons
- ALL, TALK, DIMMER buttons
- Replaceable text label for each zone button
- Zone buttons have activation LED.
- Flush mounting, backbox for wall mounting is available
- Local Mute (from hardware version 4.0)

Technical data

Material:	Black anodized aluminum
Front:	Graphic front film
Mounting:	Wall with 4x4 mm screws
Dimensions:	144W x 144H x 82D mm
Cabling:	Pluggable screw terminals, max 2.5 mm2 cable
Cable glands:	2 x PG-16
Weight:	0.3 Kg (with microphone 0.5 Kg)
Protection:	IP44

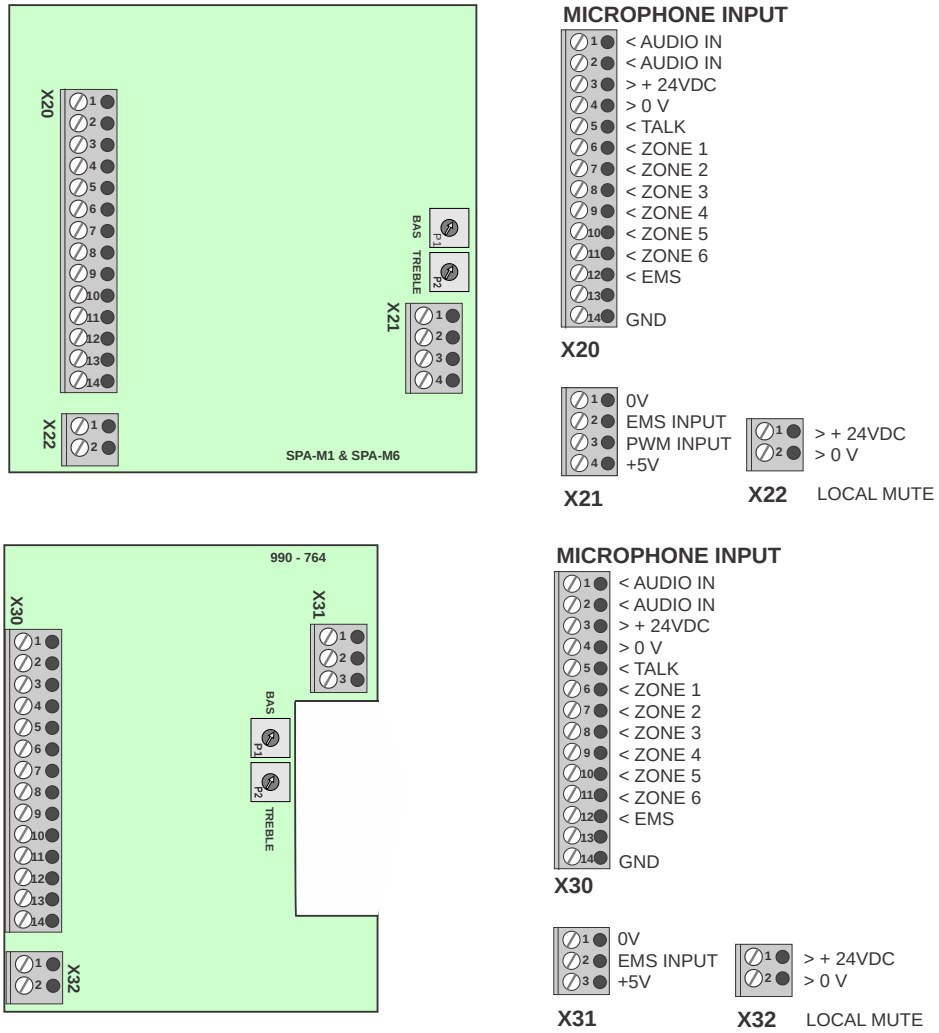


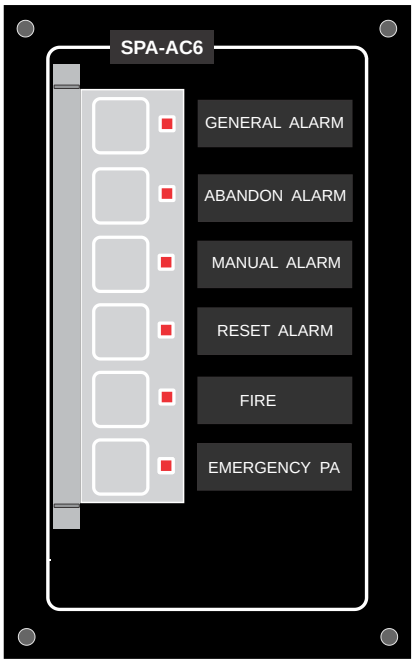
Figure 41 Board & Connectors for PA panels SPA-M6-D

5.1.5 SPA-M6BOKS

Box for SPA-M1 and SPA-M6 panels when wall mounted.

Technical data

Material:	Black anodized aluminum
Dimensions:	144W x 144H x 82D mm
Weight:	0.3 Kg



5.1.6 SPA-AC6

Single alarm panel with covered and illuminated alarm start and reset button for indoor use.

- Buttons for activating abandon, general or manual alarms.
- Replaceable text label for each button
- Separate Emergency button, EMS for PA message.
- Hinged transparent buttons cover
- To be used together with SPA-M6
- Flush mounting, backbox for wall mounting is available

Technical data

Material:	Black anodized aluminum
Front:	Graphic front film
Mounting:	Wall with 4x4 mm screws
Dimensions:	96W x 144H x 82D mm
Cabling:	Pluggable screw terminals, max 2.5 mm2 cable
Cable glands:	2 x PG-16
Weight:	0.3 Kg
Protection:	IP44

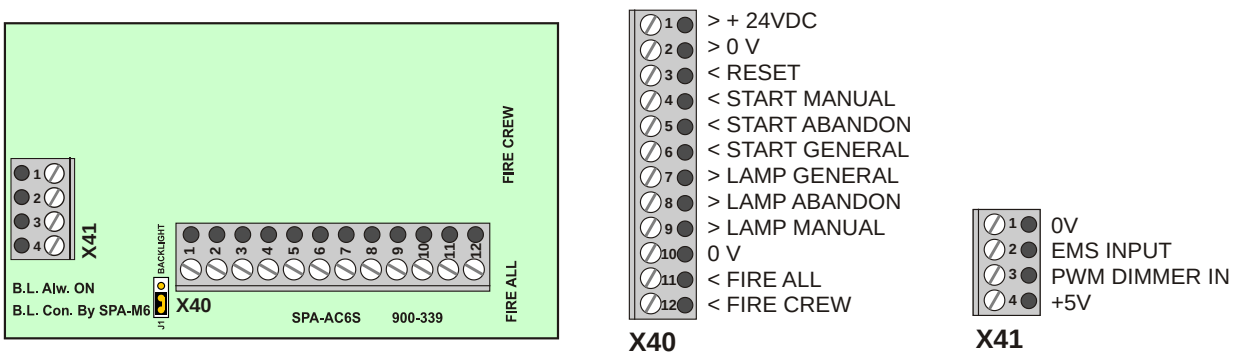
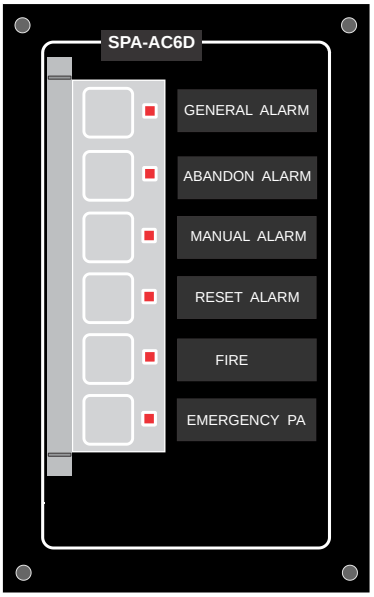


Figure 42 Board and Connectors for SPA-AC6



5.1.7 SPA-AC6-D

Dual alarm panel with covered and illuminated alarm start and reset button for indoor use.

- Duplicated activating of abandon, general or manual alarms.
- Replaceable text label for each button
- Separate Emergency button (EMS) for PA message.
- Hinged transparent buttons cover
- To be used together with SPA-M6-D
- Flush mounting, backbox for wall mounting is available

Technical data

Material:	Black anodized aluminum
Front:	Graphic front film
Dimensions:	96W x 144H x 82D mm
Cabling:	Pluggable screw terminals, max 2.5 mm2 cable
Cable glands:	2 x PG-16
Weight:	0.3 Kg
Protection:	IP44

5.1.8 ACBOKS

Box for SPA-AC6 and SPA-AC6-D panels when wall mounted

Technical data

Material:	Black anodized aluminum
Dimensions:	144W x 144H x 82D mm
Weight:	0.3 K

5.1.9 SPA-W1-V2

Single Weatherproof PA panel for outdoor use.

- Contact for WP handheld microphone P-66
- Built-in pre-amplifier with preset signal level and tone controls.
- Wall mounting.
- Local Mute (from hardware version 4.0)

Technical data

Material:	Polyester
Front:	Graphic front film
Mounting:	Wall with 4x4 mm screws
Dimensions:	140W x 230H x 125D mm
Cabling:	Pluggable screw terminals, max 2.5 mm2 cable
Cable glands:	2 x PG-16
Weight:	0.5 Kg
Protection:	IP66

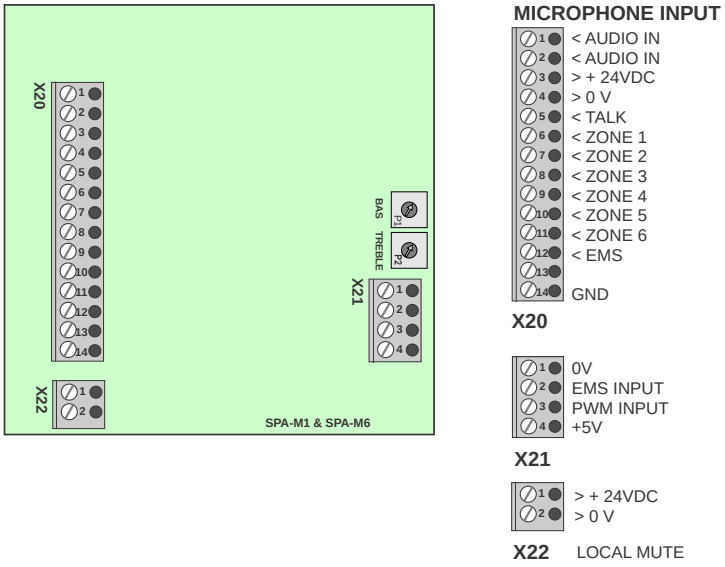
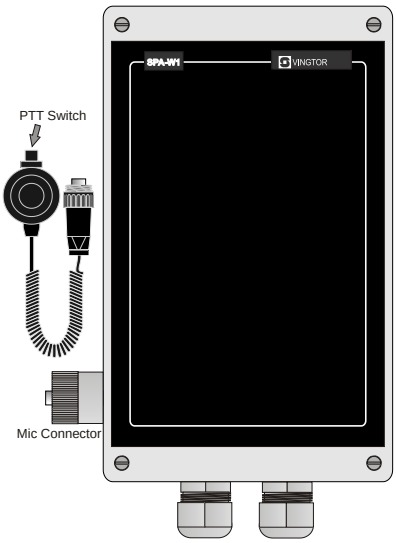


Figure 43 Board & Connectors for PA Panel SPA-W1-V2



5.1.10 SPA-W1-D

Dual Weatherproof PA panel for outdoor use.

- Two independent control boards for dual PA systems (A-B systems)
- Contact for WP handheld microphone P-66
- Built-in pre-amplifier with preset signal level and tone controls.
- Wall mounting
- Local Mute (from hardware version 4.0)

Technical data

Material:	Polyester
Front:	Graphic front film
Mounting:	Wall with 4x4 mm screws
Dimensions:	140W x 230H x 125D mm
Cabling:	Pluggable screw terminals, max 2.5 mm2 cable
Cable glands:	4 x PG-16
Weight:	0.5 Kg
Protection:	IP66

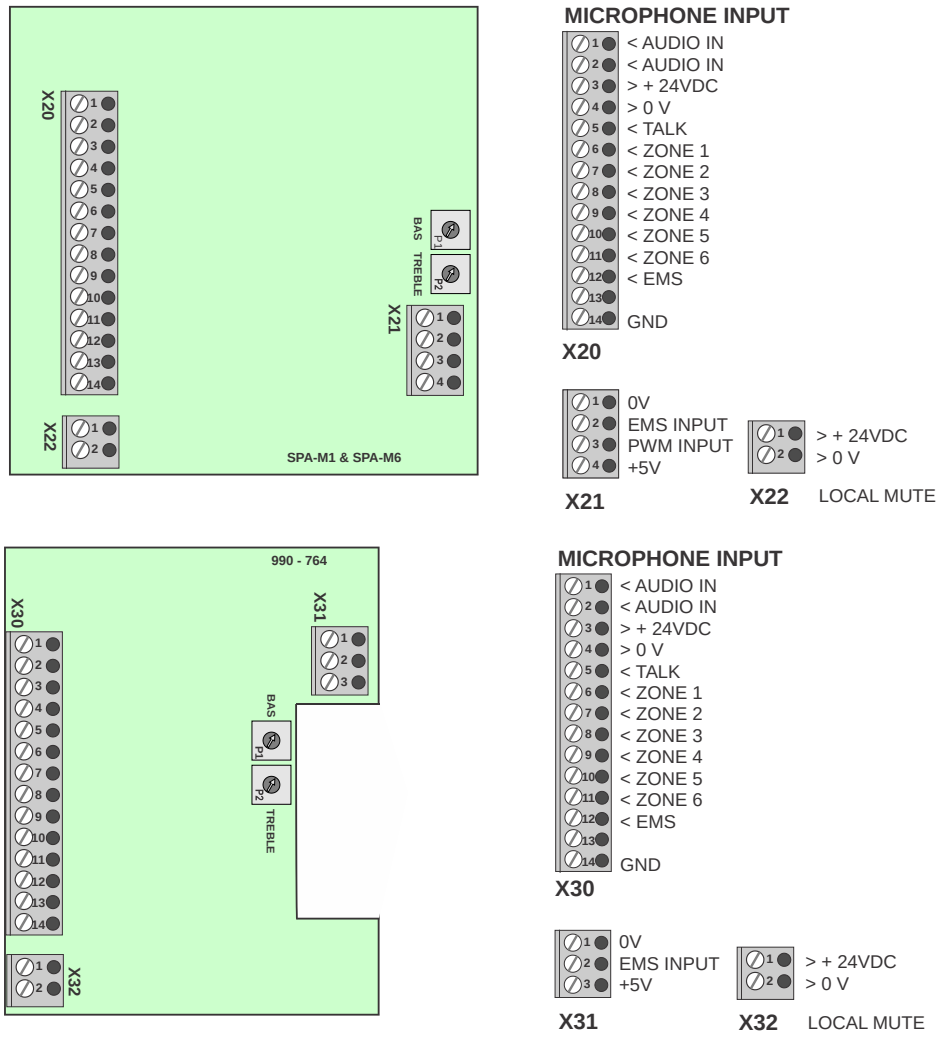
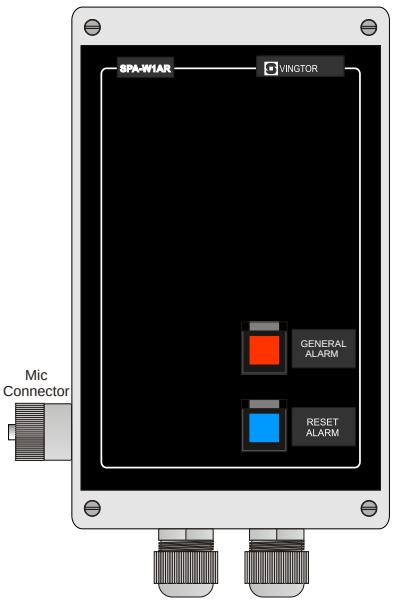


Figure 44 Board & Connectors for PA panel SPA-W1-D



5.1.11 SPA-W1AR-V2

Single Weatherproof PA and alarm Panel for outdoor use.

- Contact for WP handheld microphone P-66.
- Built-in pre-amplifier with preset signal level and tone controls.
- Alarm and reset button with hinged transparent cover.
- Replaceable text label for the buttons
- Local Mute (from hardware version 4.0)

Technical data

Output:	0.775mV 0dB
Freq. response:	50 – 10Khz + - 10dB
Sensitivity:	Dynamic 200 ohm / 100 Mv
Material:	Polyester
Front:	Graphic front film
Mounting:	Wall with 4x4 mm screws
Dimensions:	140W x 230H x 125D mm
Cabling:	Pluggable screw terminals, max 2.5 mm2 cable
Cable glands:	2 x PG-16
Weight:	0.5 kg
Protection:	IP66

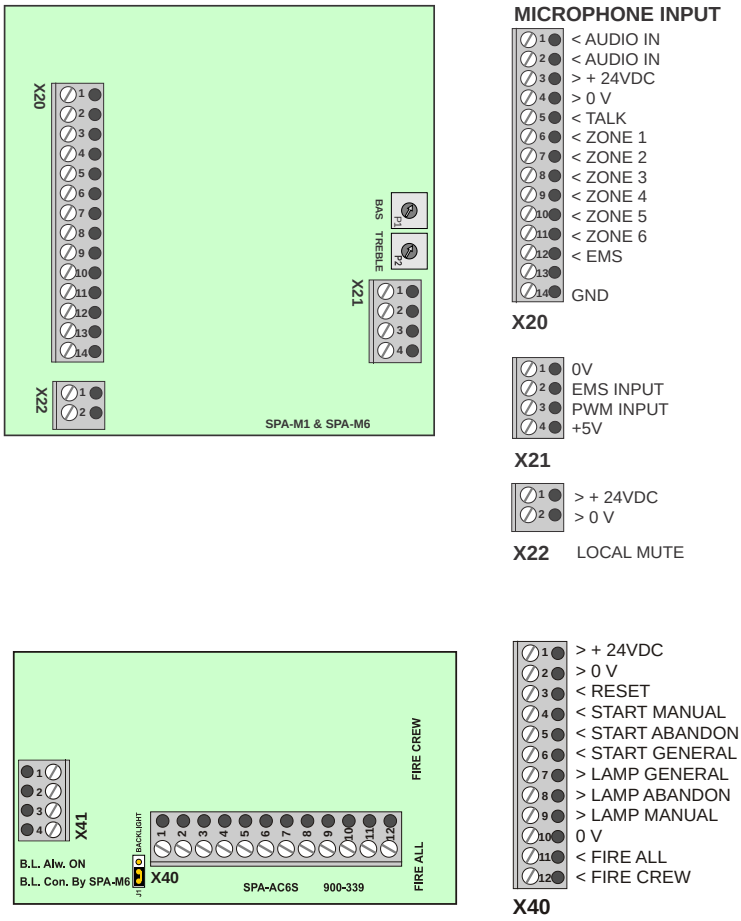
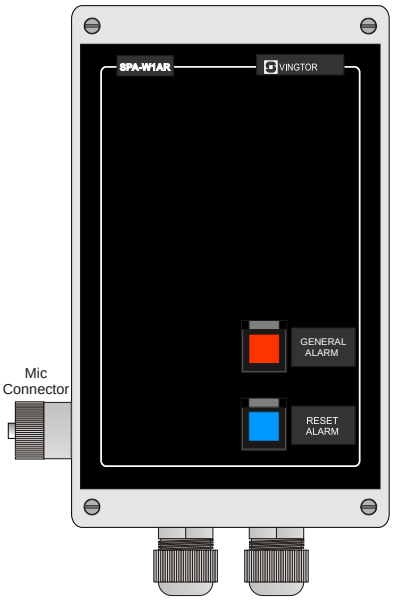


Figure 45 Board & Connectors for Alarm panel SPA-W1AR-V2

5.1.12 SPA-W1AR-D

Dual Weatherproof PA and alarm Panel for outdoor use.

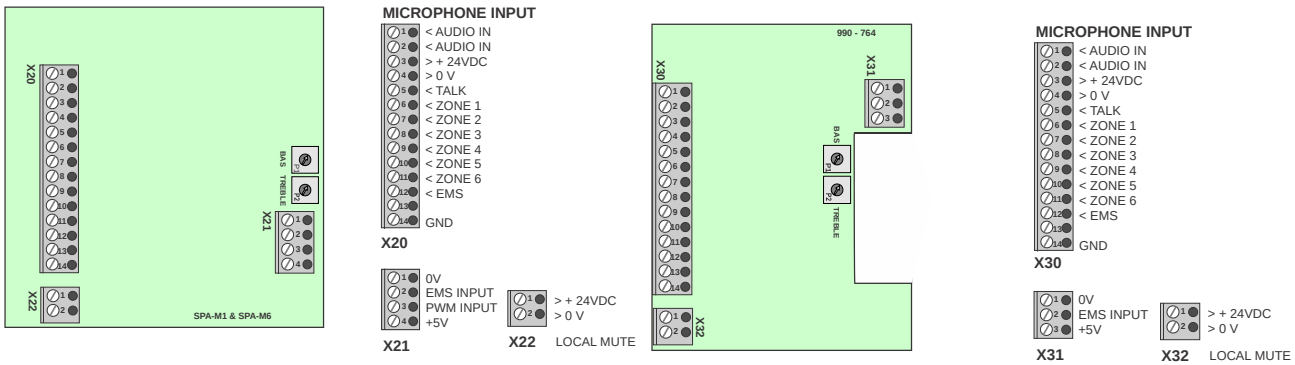


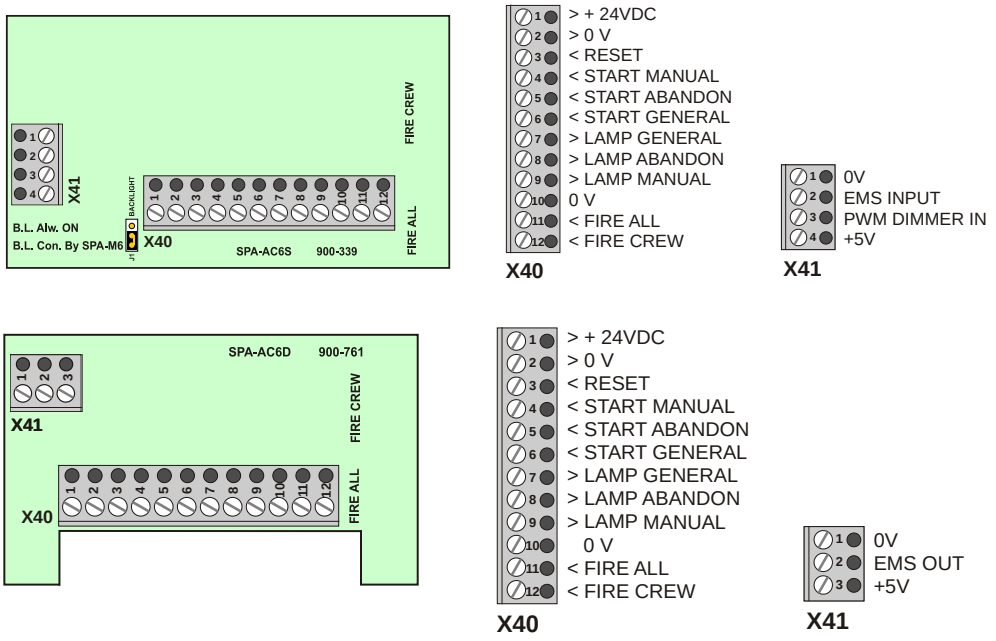
- Two independent control boards for dual PA systems (A-B systems)
- Duplicated activation of manual alarms.
- Contact for WP handheld microphone P-66
- Built-in pre-amplifier with preset signal level and tone controls.
- Alarm & reset button with hinged transparent cover.
- Replaceable text label for each button
- Local Mute (from hardware version 4.0)

Technical data

Material:	Polyester
Front:	Graphic front film
Mounting:	Wall with 4x4 mm screws
Dimensions:	140W x 230H x 125D mm
Cabling:	Pluggable screw terminals, max 2.5 mm2 cable
Cable glands:	2 x PG-16
Weight:	0.7 Kg
Protection:	IP66

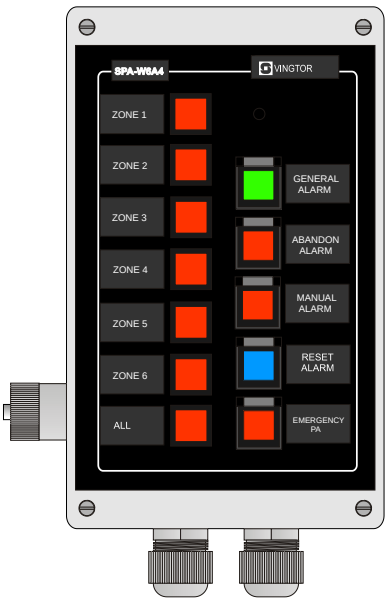
Figure 46 Boards & Connectors for Alarm panel SPA-W1AR-D





5.1.13 SPA-W6A4

Single Weatherproof PA and alarm Panel for outdoor use.



- Contact for WP handheld microphone P-66
- Built-in pre-amplifier with preset signal level and tone controls.
- 6 zones and All Call.
- Separate Emergency PA button
- Alarm buttons with hinged transparent cover.
- Replaceable text label for each button
- Local Mute (from hardware version 4.0)

Technical data

Material:	Polyester
Front:	Graphic front film
Mounting:	Wall with 4x4 mm screws
Dimensions:	140W x 230H x 125D mm
Cabling:	Pluggable screw terminals, max 2.5 mm^2 cable
Cable glands:	2 x PG-16
Weight:	0.7 Kg
Protection:	IP66

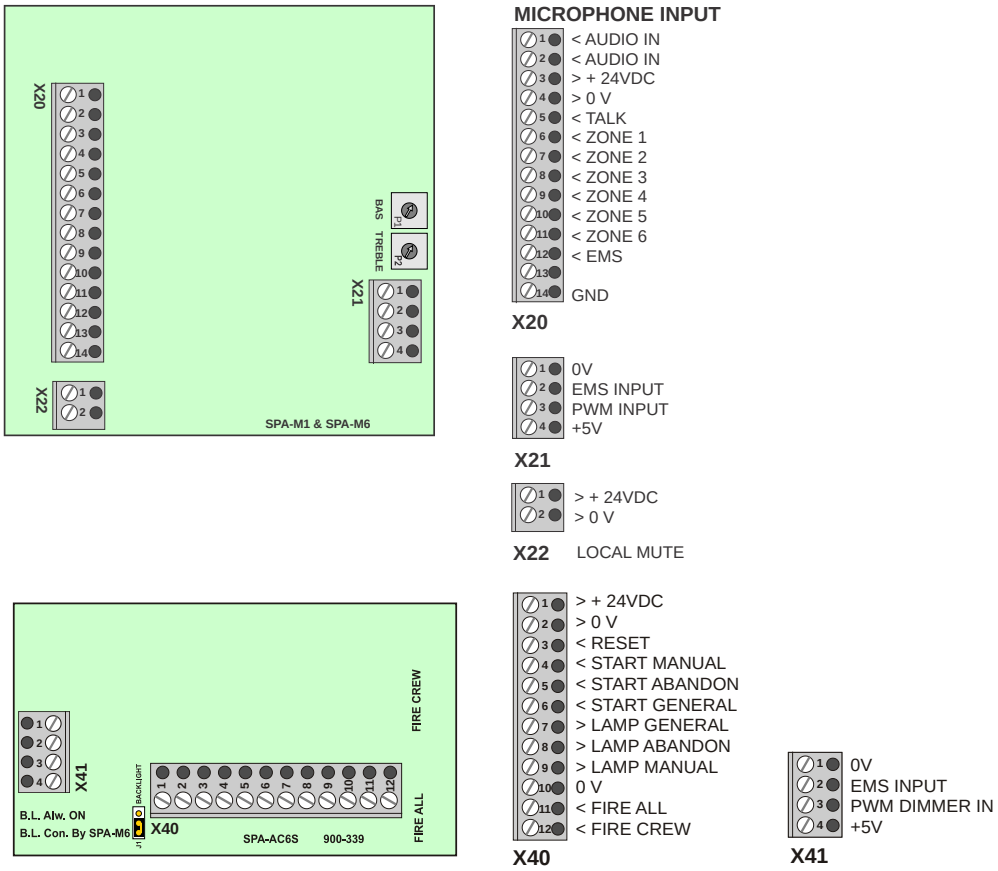
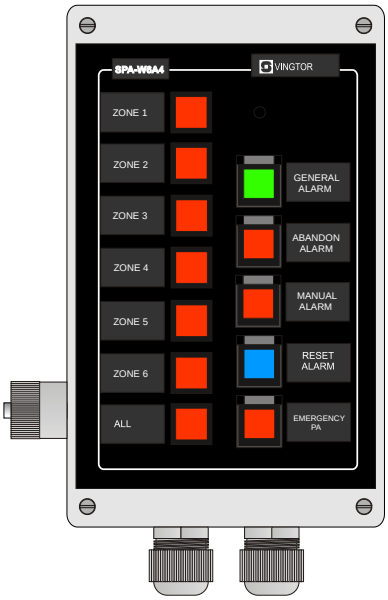


Figure 47 Boards & Connectors for Alarm panel SPA-W6A4

5.1.14 SPA-W6A4-D



Dual Weatherproof PA and alarm Panel for outdoor use.

- Duplicated activation of abandon, general or manual alarms.
- Contact for WP handheld microphone P-66
- Built-in pre-amplifier with preset signal level and tone controls.
- 6 zones and All Call.
- Separate Emergency PA button
- Alarm buttons with transparent cover.
- Replaceable text label for each button
- Local Mute (from hardware version 4.0)

Technical data

Material:	Polyester
Front:	Graphic front film
Mounting:	Wall with 4x4 mm screws
Dimensions:	140W x 230H x 125D mm
Cabling:	Pluggable screw terminals, max 2.5 mm^2 cable
Cable glands:	2 x PG-16
Weight:	0.7 Kg
Protection:	IP66

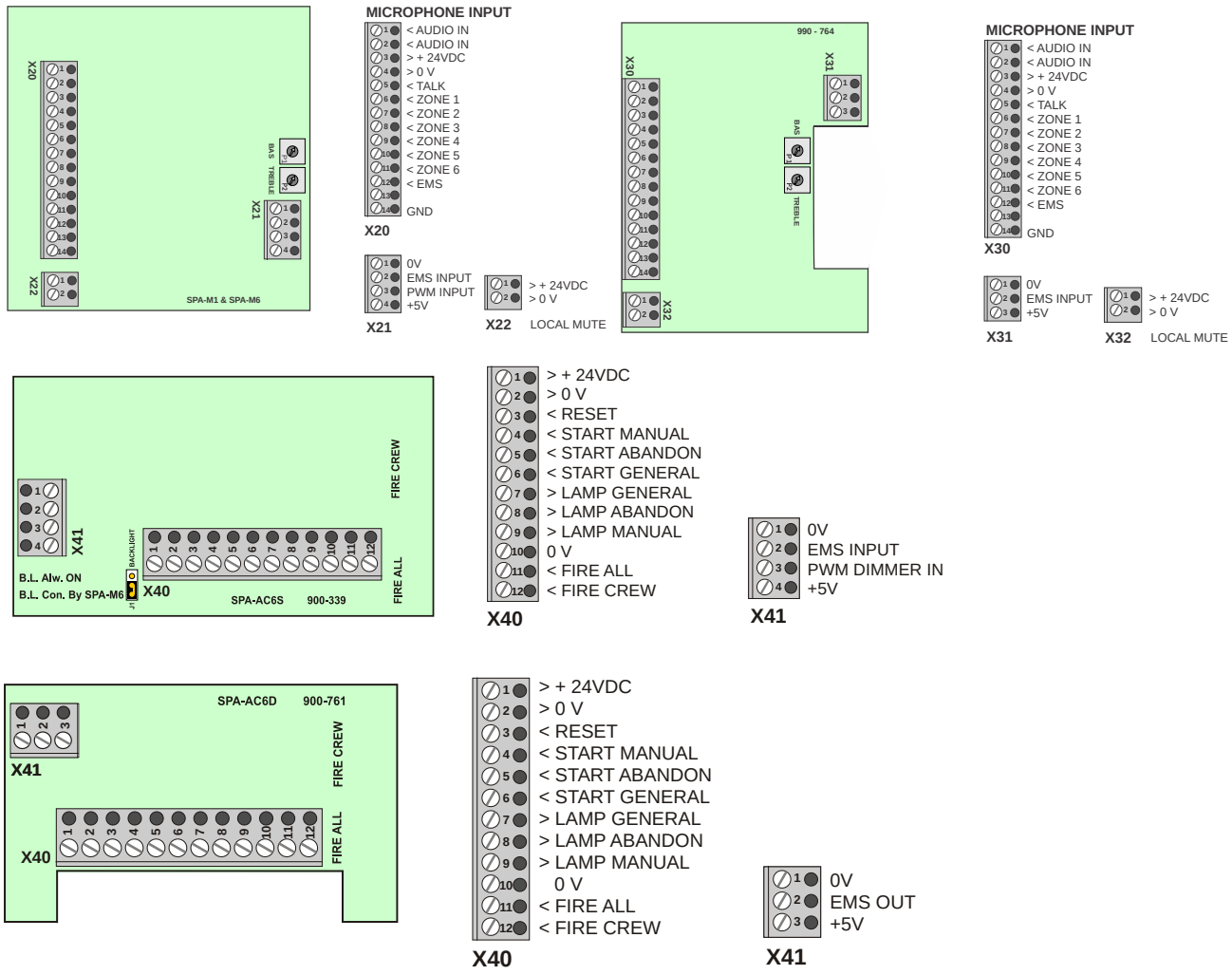
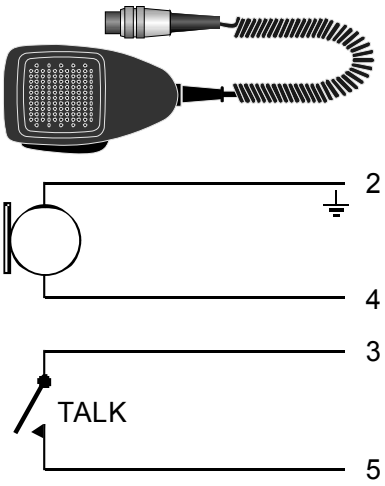


Figure 48 Boards & Connectors for Alarm panel SPA-W6A4-D

5.1.15 ETC-1-TB

Handheld microphone for Microphone Panels type SPA-M1-V2, SPA-M6-V2, SPA-M1-D, SPA-M6-D, Talk-Back panels.



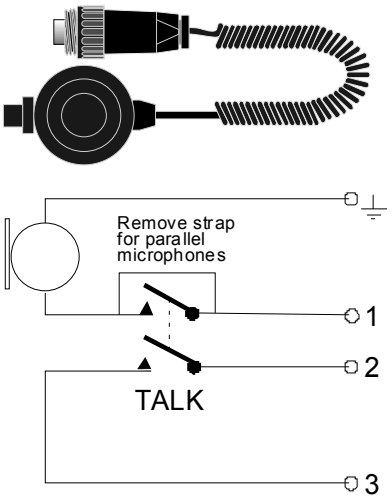
- The microphone has a built-in TALK button.
- Wall mount holder available.

Technical data

Type	Dynamic
Impedance	200 ohm
Freq. response:	200-4500 Hz
Polar pattern	Omni-directional
Switch	Push-to-talk
Cable	2 m 3-wire spiraled with shield
Plug	5-pole DIN
Accessories	Wall mount holder

5.1.16 P-66 & P-66/10

Water resistant handheld microphone for Microphone Panels type SPA-W1-V2 SPA-W1AR-V2 (-D) and SPA-W6A4 (-D)



- The microphone has a built-in TALK button.
- Wall mount holder available.

Technical data

Type	Dynamic
Impedance	200 ohm
Freq. response:	200-5000 Hz
Polar pattern	Omni-directional
Switch	Push-to-talk
Cable	1.5 m 3-wire spiraled with shield (P-66/10: 10 m)
Plug	4-pole C16-1 IP67
Protection class:	IP47
Accessories	Wall mount holder

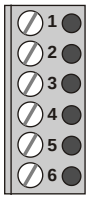
5.1.17 MB-30G

Gooseneck microphone for Microphone Panels type SPA-M1-V2, SPA-M6-V2, SPA-M1-D, SPA-M6-D, Talk-Back panels

Technical data

Type	Electret
Impedance	2 K ohm
Freq. response:	100 - 20000 Hz
Polar pattern	Cardiac
Front to back ratio	10 dB @ 1kHz
Length	430 mm
Plug	5-pole DIN
Supply	1.1 - 9V
Accessories	Sponge windscreen

5.2 Volume Controls



<100V LINE IN
<100V LINE IN
>100V LINE OUT
>100V LINE OUT
<+24V OVERRIDE
<-24V OVERRIDE

5.2.1 VCOR-15

- Volume control 15W single PA system
- For entertainment system with 24V override

Technical data

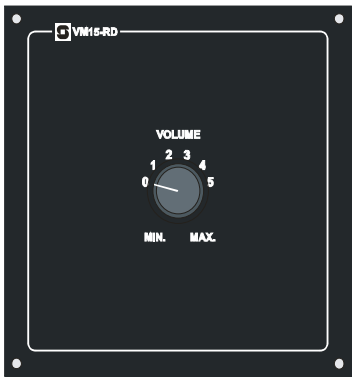
Material:	ABS
Front:	Printed graphic.
Mounting:	Flush with 4x4 mm screws
VCOR-OBOX:	Optional wall mounting box
Dimensions:	87W x 87H x 67.5D mm
Cabling:	Pluggable screw terminals max 2.5 mm^2 cable
Cable glands:	2 x PG-16
Weight:	0.22 Kg
Protection:	IP30

5.2.2 VCOR-60

- Volume control 60W single PA system
- For entertainment system with 24V override

Technical data

Material:	ABS
Front:	Printed graphic.
Mounting:	Flush with 4x4 mm screws
VCOR-OBOX:	Optional wall mounting box
Dimensions:	87W x 87H x 67.5D mm
Cabling:	Pluggable screw terminals max 2.5 mm^2 cable
Cable glands:	2 x PG-16
Weight:	0.22 Kg
Protection:	IP30



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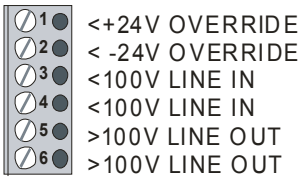

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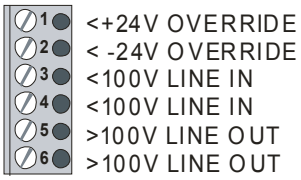
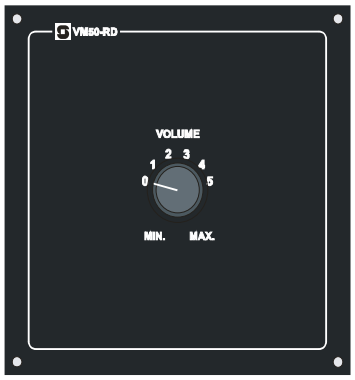


5.2.3 VM15-RDF

- Dual Volume control 2 x 15W PA system
- For entertainment system with 24V override relay failsafe

Technical data

Material:	Black anodized aluminum
Front:	Printed graphic.
Mounting:	Flush with 4x4 mm screws
STBOKS5:	Optional wall mounting box
Dimensions:	144W x 144H x 82D mm
Cabling:	Pluggable screw terminals max 2.5 mm2 cable
Cable glands:	1 x PG-29
Weight:	Approx. 0.7 Kg
Protection:	IP44



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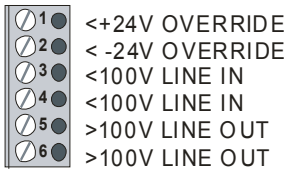

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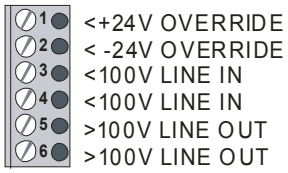
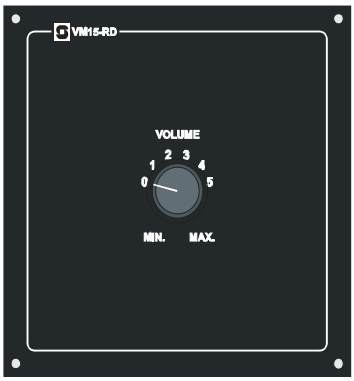


5.2.4 VM50-RDF

- Dual Volume control 2x 50W PA system
- For entertainment system with 24V override relay failsafe

Technical data

Material:	Black anodized aluminum
Front:	Printed graphic.
Mounting:	Flush with 4x4 mm screws
STBOKS5:	Optional wall mounting box
Dimensions:	144W x 144H x 82D mm
Cabling:	Pluggable screw terminals max 2.5 mm2 cable
Cable glands:	1 x PG-29
Weight:	Approx. 0.7 Kg
Protection:	IP44



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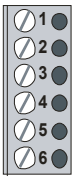

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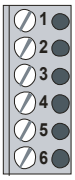
>100V LINE OUT

B



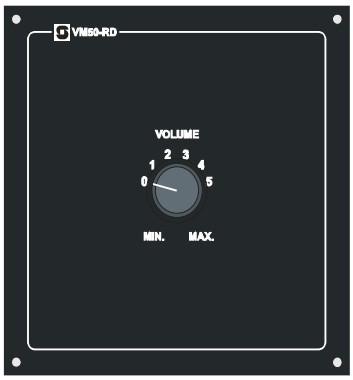
<+24V OVERRIDE
< -24V OVERRIDE
<100V LINE IN
<100V LINE IN
>100V LINE OUT
>100V LINE OUT

5.2.5 VM15-RD

- Dual Volume control 15W PA system
- For entertainment system with 24V override

Technical data

Material:	Black anodized aluminum
Front:	Printed graphic.
Mounting:	Flush with 4x4 mm screws
STBOKS5:	Optional wall mounting box
Dimensions:	144W x 144H x 82D mm
Cabling:	Pluggable screw terminals max 2.5 mm2 cable
Cable glands:	1 x PG-29
Weight:	Approx. 0.7 Kg
Protection:	IP44



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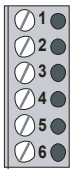

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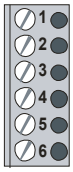
>100V LINE OUT

B



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>100V LINE OUT

5.2.6 VM50-RD

- Dual Volume control 50W PA system
- For entertainment system with 24V override

Technical data

Material:	Black anodized aluminum
Front:	Printed graphic.
Mounting:	Flush with 4x4 mm screws
STBOKS5:	Optional wall mounting box
Dimensions:	144W x 144H x 82D mm
Cabling:	Pluggable screw terminals max 2.5 mm2 cable
Cable glands:	1 x PG-29
Weight:	Approx. 0.7 Kg
Protection:	IP44

5.2.7 SPA-BOXM1

Wall mounting box for VM15-R and VM50-R.

Technical data

Material:	Black painted steel
Mounting:	With 4x4 mm screws
Dimensions:	96W x 96H x 58D mm
Weight:	Approx. 0.3 Kg

5.2.8 STBOKS5

Wall mounting box for VM15-RD and VM50-RD

Technical data

Material:	Black anodized aluminum
Mounting:	With 4x4 mm screws
Dimensions:	144W x 144H x 57D mm
Weight:	Approx. 0.7 Kg

5.3 Loudspeakers

5.3.1 SAFE-10PTF

Loudspeaker with 100V transformer, two cable inlets and fuse 10W.

Technical data

Mounting:	Wall
Dimensions:	206W x 104H x 55D mm
Weight:	0.8 Kg
Protection:	IP44

5.3.2 HP-15TF

Horn loudspeaker with 100V transformer and fuse 15W, WT

Technical data

Dimensions:	200Ø x 247D mm
Weight:	1.7 Kg
Protection:	IP56

5.3.3 CL-200T

Loudspeaker, flush-mounted with steel fire dome and backbox, 10W

Technical data

Mounting:	Ceiling
Dimensions:	199Ø x 121.5D mm
Weight:	1.45 Kg
Protection:	IP44

5.3.4 CAR-4T

Loudspeaker 4W with 100V transformer - double faced for accommodations and corridors use.

Technical data

Mounting:	Wall
Dimensions:	152Ø x 90D mm
Weight:	1.5 Kg

This loudspeaker is also available with fuse, CAR-4TF.

5.3.5 CAU-4T

Loudspeaker 4W with 100V transformer, WT for use in galleys etc.

Technical data

Mounting:	Wall
Dimensions:	128W x 237H x 100D mm
Weight:	1.9 Kg
Protection:	IP55

5.3.6 CW-4T

Loudspeaker 4W with 100V transformer, nut tree finish for accommodations use.

Technical data

Mounting:	Wall
Dimensions:	250W x 170H x 88D mm
Weight:	1.2 Kg

5.3.7 CW-4T/VO

Loudspeaker 4W with 100V transformer, volume control and 4 wire 24V override, nut tree finish for accommodations use.

Technical data

Mounting:	Wall
Dimensions:	250W x 170H x 88D mm
Weight:	1.2 Kg

Further info from datasheet

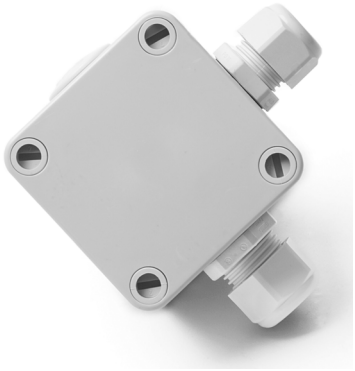
This loudspeaker is also available with fuse, CW-4T/VOF.

5.3.8 VLS-15TF

Horn loudspeaker 15W 100V transformer with fuse for use in deck areas, engine room, etc.

Technical data

Dimensions:	253W x 152H x 309D mm
Weight:	1.85 Kg
Protection:	IP66



5.3.9 JB-15T

Junction box for VLS-15T

Technical data

Dimensions:	97W x 90H x 58D mm
Weight:	0.12 Kg
Protection:	IP66

5.3.10

HP-30T

Horn loudspeaker 100V 30W, WT

Technical data

Dimensions:	237Ø x 286D mm
Weight:	2.3 Kg
Protection:	IP67

5.3.11 DST-100

Driver 100V 100W, WT for horn DH-30 or DH-50 for use in deck areas.

Technical data

Dimensions:	128Ø x 176D mm
Weight:	2.5 Kg
Protection:	IP67

5.3.12 DH-30

Horn for driver DST-100, WT for use in deck areas.

Technical data

Dimensions:	325Ø x 345D mm
Weight:	3.6 Kg
Protection:	IP67

5.3.13 DH-50

Horn for driver DST-100, WT for use in deck areas.

Technical data

Dimensions:	508Ø x 505D mm
Weight:	5.15 Kg
Protection:	IP67

5.3.14 BF-560STT

Special loudspeaker, tropicalized with steel dome 100V 6W, 2x M20 glands and fuse for accommodations use.

Technical data

Mounting:	Ceiling, flush.
Dimensions:	165Ø x 107D mm
Weight:	1.2 Kg

5.3.15 VES-561TF

Ceiling loudspeaker flush mounted, 6W

Technical data

Mounting:	Ceiling, flush.
Dimensions:	165Ø x 112D mm
Weight:	1,1 Kg

5.3.16 CAREEX-6T

ATEX approved EX loudspeaker 100V 4W, double faced for accommodations and corridors use.

Technical data

Mounting:	Wall
Dimensions:	170Ø x 145D mm
Weight:	4.0 Kg

5.3.17 DSP-15EEXMNT

ATEX approved EX loudspeaker 100V 15W, WT for use in deck areas, engine room, etc.

Technical data

Dimensions:	186W x 144H x 207D mm
Weight:	2.2 Kg
Protection:	IP-67

5.3.18 DHP/DST-40EEXENT

Antistatic Horn W/ Atex App. 40W Driver

Technical data

Dimensions:	368W x 175H x 380D mm
Weight:	4.0 Kg
Protection:	IP-67

5.3.19 BA-56EEXENT

ATEX approved ceiling loudspeaker 100V 6W

Technical data

Dimensions:	220Ø x 172D mm
Weight:	3,0 Kg
Protection:	IP-67

5.3.20 HP-20EEXIINT

Loudspeaker 20W, 100V, Ex Zone 2

Technical data

Dimensions:	237Ø x 286D mm
Weight:	2,3 Kg
Protection:	IP-67

The WEEE Directive does not legislate that Zenitel, as a 'producer', shall collect 'end of life' WEEE.

This 'end of life' WEEE should be recycled appropriately by the owner who should use proper treatment and recycling measures. It should not be disposed to landfill.

Many electrical items that we throw away can be repaired or recycled. Recycling items helps to save our natural finite resources and also reduces the environmental and health risks associated with sending electrical goods to landfill.

Under the WEEE Regulations, all new electrical goods should now be marked with the crossed-out wheeled bin symbol shown.

Goods are marked with this symbol to show that they were produced after 13th August 2005, and should be disposed of separately from normal household waste so that they can be recycled.

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