



**EN54 certified products.**



In either event, the entertainment system must also comply with safety standards and codes of practice.

# A new standard for safety.

d&b audiotechnik is a leading global provider of audio solutions including adjacent technical and financial service offerings for a broad range of installation applications. Public Address Voice Alarm (PAVA) systems are becoming a more relevant part of installation project requirements. The EN54 series is a set of European standards that includes product standards and application guidelines for fire alarm and voice alarm systems.

For historical and technical reasons a larger number of installation projects have used two independent sound reinforcement systems: One system for high performance sound reproduction (for which d&b audiotechnik is typically known for) and a second system for standardized public announcements, reproduction of acoustic signals and messaging, including voice alarm. In order to meet project requirements that integrate the entertainment system into the voice alarm system, d&b developed EN54-certified products to enable compliance to such standards.

## General challenges

Whilst a PAVA system may require the use of EN 54-xx tested equipment, you may not be able to comply with that requirement for a number of reasons.

**The routing and processing of audio signals** may be sufficiently complex that specialist professional audio equipment cannot be tested according to EN54-16. This is often the case with contemporary expectations for pre-, post- and match time performances for speech announcements and music/show program/advertisement. d&b electronics listed in this document are EN54 certified when used in context with a VACIE designed by [www.pava-facilities.com](http://www.pava-facilities.com).

**The power consumption of appropriate loudspeakers** requires amplifiers more powerful than any tested under EN54-16, which is typically the case for the “bowl” system of at least medium to large arenas and stadia.

**The power required for the system and the use of 220/230V equipment** means that an EN54-4 compliant power supply cannot be used, because at time of publication, no such device is available on the market.

**Challenges from a designer/specifier perspective (pre-installation)**

- The Voice Alarm system must be installed in compliance with essential safety requirements of the Construction Products Regulation (CPR). Equipment type-tested to comply with EN54-4, EN54-16 and EN54-24 shall be used, but may be not available due to the complexity of the electroacoustic requirements of the project.
- Complex voice alarm systems may not normally conform to the usual requirements (Article 4) of the CPR and thus may be considered a bespoke system (Article 5), therefore don't require an EN54 certificate.
- Hence, alternatively it is acceptable to assemble the voice alarm system as a kit, based on European Commission guidance paper C (September 2002). In the event of a system being made up of a kit, it must still conform to the essential safety requirements of the CPR.

In either event, the system must also comply with the performance standards and codes of practice. Additionally, any equipment or technique using either approach must be approved by the consultant. The contractor must explain, how they have achieved a compliant system. Whilst bespoke systems are acceptable, they are not always fully understood and some projects absolutely require an EN54-16 certificate, hence d&b developed the EN54 compliant items.

# Safety. Entertainment. One System.

## Challenges from a contractor perspective (post-installation)

- If you cannot deliver a fully EN54-16 compliant system, a Voice Alarm system has been designed and installed, so that it complies with the essential safety requirements of the CPR.

- Type-tested equipment to comply with EN54-16 and EN 54-24 has not necessarily been used. The use of type tested equipment has been restricted to those applications, where that particular product is suitable.

- The system has been designed to use the most appropriate equipment at all times, in terms of reliability, integrity, resilience, functionality and user interface. Most importantly it has been designed to achieve the performance necessary for communication in the pursuance of life safety.

- The system therefore meets the essential safety requirements set out by the directive. The equipment has been chosen due to the size/power/complexity requirements of the project.

- The voice alarm system has been designed (and installed) as a bespoke system under Article 5 of the CPR as a kit based on European Commission guidance paper C (September 2002). The system also complies with project related performance standards and Code of practice.

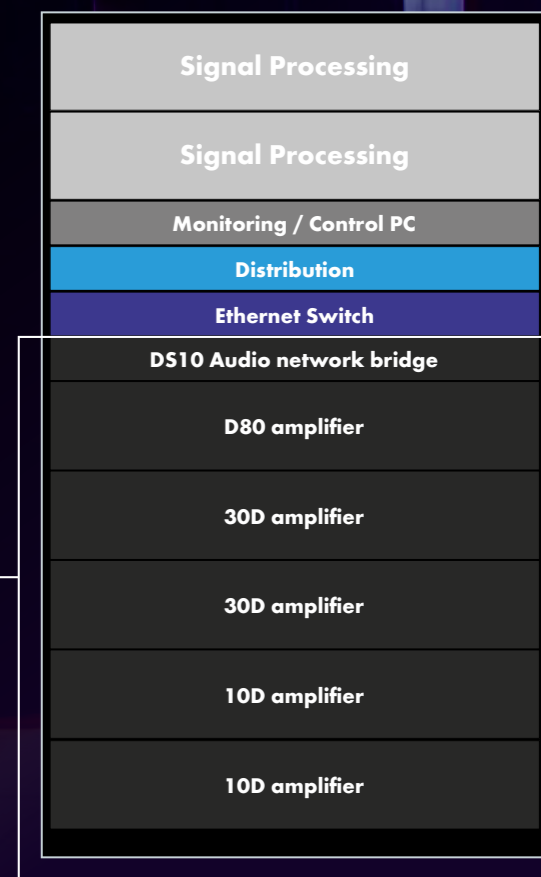
The use of EN-54 type-tested equipment would not have met the specification without introducing complexity and risk by trying to use less appropriate equipment in such a manner as to meet the specification. In this instance, the use of type-tested equipment would not have complied with the essential safety requirements set out by the Directive.

EN 54-16 represents the product standard for voice alarm electronics. In Europe it is mandatory that products used for voice alarm purposes are tested against this standard. Such tests refer to the complete VACIE containing devices for processing, amplification, fault monitoring, and signal distribution. Tests must be carried out by an accredited laboratory (notified body). If you only manufacture parts of the VACIE, such as amplifiers or processors, the standard doesn't allow items to be individually tested. Not having a relevant certificate is a serious barrier for manufacturers to participate in projects with standard compliant Voice Alarm systems being mandatory.

When certain installations require an EN54 certification, most professional audio manufacturers provide only some components of the voice alarm system and therefore cannot get certified, as only an entire system/VACIE-rack can be tested according to the EN54-16 standard.

This has been a challenge for d&b as well as other manufacturers not providing a complete VACIE. Pava facilities ([www.pavafacilities.com](http://www.pavafacilities.com)) provides a solution as an initiative from several manufacturers to create (scalable) EN54-16 compliant VACIE racks.

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## EN54-16.

### Compliant electronic components (EN54-16) in d&b's portfolio

The following d&b products are EN54-16 compliant as part of the VACIE (Voice Alarm Control and Indication Equipment) solution from [www.pavafacilities.com](http://www.pavafacilities.com).

#### D80 Amplifier Z2710

High power four channel DSP amplifier

- Maximum output power 4 x 4000 W into 4 Ω
- All current d&b loudspeaker setups

- Individual Input Monitoring, Load Monitoring settings
- Individual Fallback / Override settings
- AmpPresets including Backup and Alarm presets
- Amplifier plug-in available for system platform integration
- Additional control via Web remote



#### 10D Amplifier Z2760

Installation specific four channel DSP amplifier

- Maximum output power 4 x 700 W into 4 Ω
- All current d&b loudspeaker setups except A-Series, J-Series, SL-Series, V-Series, M2, B22-SUB
- 5 freely assignable GPIOs (General Purpose Input Output) + General fault
- Individual Input Monitoring, Load Monitoring settings
- Individual Fallback / Override settings
- AmpPresets including Backup and Alarm presets
- Amplifier plug-in available for system platform integration
- Additional control via Web remote

#### 30D Amplifier Z2770

Installation specific four channel DSP amplifier

- Maximum output power 4 x 1200 W into 4 Ω
- All current d&b loudspeaker setups except SL-Series
- 5 freely assignable GPIOs (General Purpose Input Output) + General fault
- Individual Input Monitoring, Load Monitoring settings
- Individual Fallback / Override settings

- AmpPresets including Backup and Alarm presets
- Amplifier plug-in available for system platform integration
- Additional control via Web remote



#### DS10 Audio network bridge Z4010

Interface between d&b amplifiers for AES70/ OCA remote operation and Dante audio transport protocol

- 16 x AES3 digital output channels
- 4 x AES3 digital input channels
- Integrated 5-port network switch



# EN54-24.

## Compliant loudspeakers (EN54-24) in d&b's portfolio

You may not be able to find EN54-24 tested loudspeakers producing the necessary sound pressure level while fulfilling demands for constant and/or flexible directivity over frequency, that also conform to the project requirements for weight, sight lines or requirements resulting in maximum SPL- and appropriate STI values.

**The d&b EN54-24 (and 54-16) initiative demonstrates you can have both SPL, sound quality, and safety standards within one system.**

- Dedicated solutions for installation purposes
- Best possible weight/performance ratio
- Access full performance with d&b amplification
- Constant directivity and or controlled/scalable directivity
- System performance prediction using d&b ArrayCalc complying with EASE



The following loudspeakers are available as EN54-24 certified options:

**WR**  
Weather resistant (derives from the standard product for usage under advanced outdoor environmental conditions)

**SVS**  
Special version stadium derives from standard product for exposed outdoor applications with custom rigging; also available in special colour (SC)

**SWR**  
Seawater resistant derives from standard product for exposed coastal/marine outdoor applications with custom solution rigging; also available in special colour (SC)

Category: Augmented arrays for vertical or horizontal cluster applications Installation specific medium format 2-way augmented array loudspeaker Available with standard and custom rigging options

Models	
Z0732.541	ALi60 Loudspeaker EN54-WR
Z0732.542	ALi60 Loudspeaker EN54-SWR
Z0732.543	ALi60 Loudspeaker EN54-SVS
Z0733.541	ALi90 Loudspeaker EN54-WR
Z0733.542	ALi90 Loudspeaker EN54-SWR
Z0733.543	ALi90 Loudspeaker EN54-SVS



### EN54-24

#### Components

#### Environmental type

#### Noise power

#### Max SPL @ 4m/ Test level: 24,49 V

#### Min. impedance @ 208 Hz<sup>1</sup>

#### Frequency response (-5 dB)

#### Dispersion (H x V)

##### @ 500 Hz

##### @ 1 kHz

##### @ 2 kHz

##### @ 4 kHz

#### Splay angle settings

#### Dimensions mm (H x W x D)

#### Weight kg



**ALi60**



**ALi90**

	ALi60	ALi90
<b>Components</b>	2 x 10" LF driver with neodymium magnet 1 x 1.4" exit compression driver with 3" coil Passive crossover network	2 x 10" LF driver with neodymium magnet 1 x 1.4" exit compression driver with 3" coil Passive crossover network
<b>Environmental type</b>	Type B	Type B
<b>Noise power</b>	120 W	120 W
<b>Max SPL @ 4m/ Test level: 24,49 V</b>	106.10 dB	106.10 dB
<b>Min. impedance @ 208 Hz<sup>1</sup></b>	5.33 ohms $U_{RMS}: 2.41 V_{AC} / I_{RMS}: 452.00 mA_{AC}$	5.33 ohms $U_{RMS}: 2.41 V_{AC} / I_{RMS}: 452.00 mA_{AC}$
<b>Frequency response (-5 dB)</b>	60 Hz - 18 kHz	60 Hz - 18 kHz
<b>Dispersion (H x V)</b>		
<b>@ 500 Hz</b>	60° x 135°	65° x 135°
<b>@ 1 kHz</b>	60° x 80°	85° x 80°
<b>@ 2 kHz</b>	60° x 35°	80° x 35°
<b>@ 4 kHz</b>	60° x 27°	90° x 27°
<b>Splay angle settings</b>	20° - 40° (5° increments)	20° - 40° (5° increments)
<b>Dimensions mm (H x W x D)</b>	322 x 700 x 356	322 x 700 x 356
<b>Weight kg</b>	23	23

<sup>1</sup> Frequency at which the minimum impedance was determined





**EN54**  
Certified



EN54-24	Yi8	Yi12	8S
<b>Components</b>	2 x 8" driver with neodymium magnet 1 x 1.4" exit compression driver Passive crossover network	2 x 8" driver with neodymium magnet 1 x 1.4" exit compression driver Passive crossover network	1 x 8" driver with neodymium magnet 1 x 1" compression driver coaxially mounted Passive crossover network
<b>Environmental type</b>	Type B	Type B	Type B
<b>Noise power</b>	104 W	104 W	60 W
<b>Max SPL @ 4m/ Test level: 24,98 V</b>	103.80 dB	103.80 dB	96.60 dB
<b>Min. impedance</b>	5.92 ohms @ 230 Hz <sup>1</sup> $U_{RMS}: 2.5 V_{AC} / I_{RMS}: 422.00 mA_{AC}$	5.92 ohms @ 230 Hz <sup>1</sup> $U_{RMS}: 2.5 V_{AC} / I_{RMS}: 422.00 mA_{AC}$	7.72 ohms @ 1560 Hz <sup>1</sup> $U_{RMS}: 2.5 V_{AC} / I_{RMS}: 324.00 mA_{AC}$
<b>Frequency response (-5 dB)</b>	60 Hz - 18 kHz	60 Hz - 18 kHz	70 Hz - 20 kHz
<b>Dispersion (H x V)</b>			
<b>@ 500 Hz</b>	66° x 158°	70° x 162°	60° x 135°
<b>@ 1 kHz</b>	59° x 100°	68° x 111°	60° x 80°
<b>@ 2 kHz</b>	81° x 53°	100° x 64°	60° x 35°
<b>@ 4 kHz</b>	89° x 29°	128° x 34°	60° x 27°
<b>Dimensions mm (H x W x D)</b>	257 x 630 x 375	257 x 630 x 375	352 x 224 x 205
<b>Weight kg</b>	20	20	7.4

<sup>1</sup> Frequency at which the minimum impedance was determined



<b>Y-Series loudspeakers</b> Category: Line array. Installation specific high performance 2-way passive line array loud-speaker Yi8 / Yi12 Loudspeakers EN54. Available with standard and custom rigging options, special colour	<b>Models</b>	Z0717.541	Yi8 Loudspeaker EN54-WR
		Z0717.542	Yi8 Loudspeaker EN54-SWR
		Z0717.543	Yi8 Loudspeaker EN54-SVS
		Z0718.541	Yi12 Loudspeaker EN54-WR
	Z0718.542	Yi12 Loudspeaker EN54-SVS	
	Z0718.543	Yi12 Loudspeaker EN54-SWR	
<b>8S loudspeaker</b> Category: Point source. Installation specific 2-way compact coaxial loudspeaker	<b>Models</b>	Z1617.541	8S Loudspeaker EN54-WR
		Z1617.542	8S Loudspeaker EN54-SWR

**More art. Less noise.**