

ADRESSABLE ACOUSTIC AND OPTICAL ALARM DEVICES (SOUNDER BEACON)

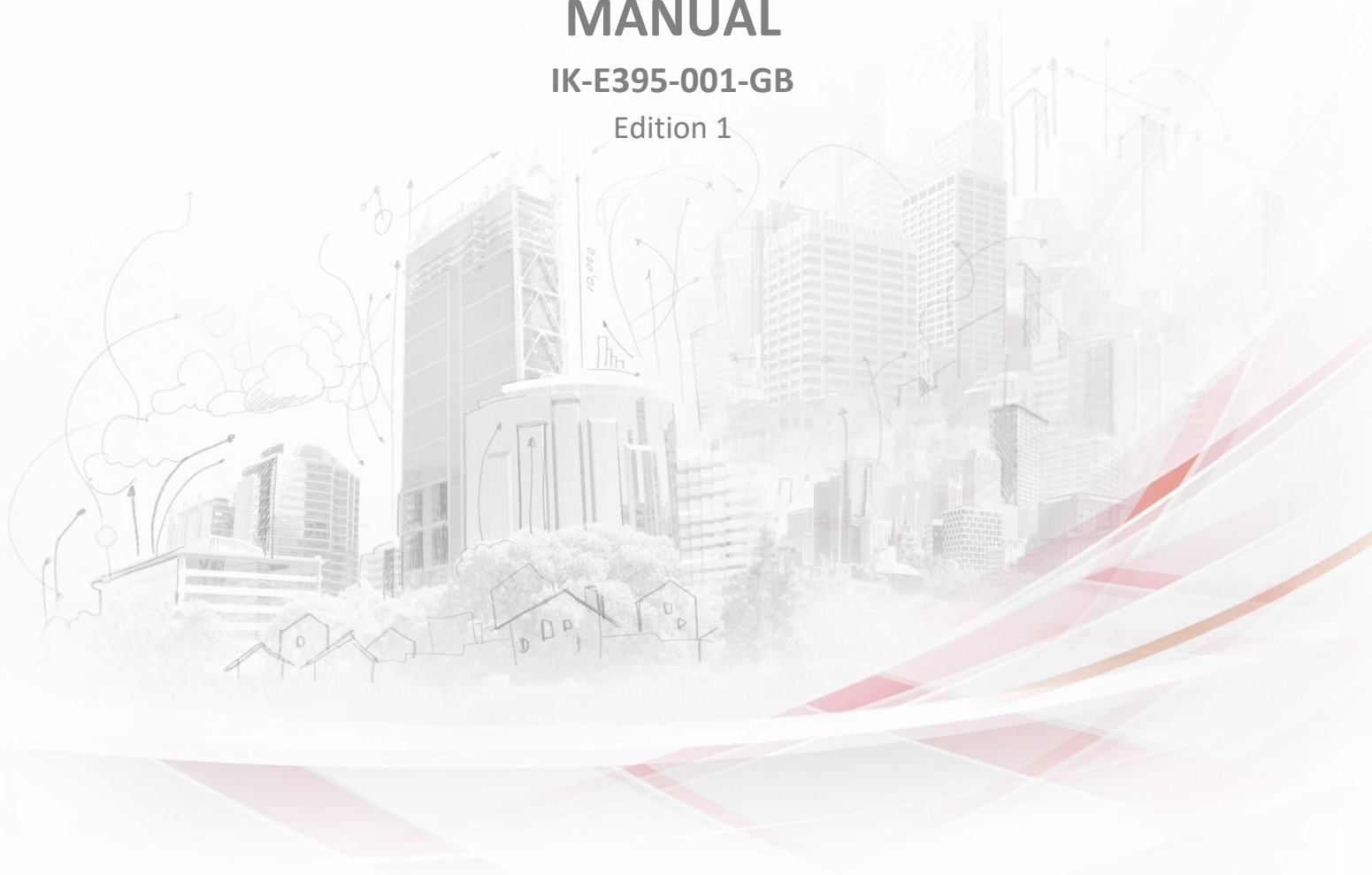
SAB-3001 and SAB-3006

POLON 3000 FIRE ALARM SYSTEM

INSTALLATION AND MAINTENANCE MANUAL

IK-E395-001-GB

Edition 1



The SAB-3001 and SAB-3006 addressable acoustic alarm devices, which are the subject of this Manual, meet the essential requirements of the following regulations of the European Parliament and of the Council (EU) and European Union directives:

CPR CPR/305/2011 Regulation (EU) of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products repealing Council Directive 89/106/EEC;

EMC 2014/30/EU Electromagnetic Compatibility Directive.

The product has been issued by CNBOP-PIB, notified body No. 1438, a certificate of constancy of performance, confirming the possession of technical features/parameters required by EN 54-3:2001+A1:2002+A2:2006, EN 54-17:2005 and EN 54-23:2010.

The Manufacturer's features/technical parameters exceeding the requirements of the above-mentioned standards and other features/parameters of the product specified in this manual not specified in the above-mentioned standards are confirmed by the Manufacturer.

The product has a Certificate of Approval issued by CNBOP-PIB.

The manufacturer has issued a Declaration of Performance for the product.

The Certificate, Certificate of Acceptance and Declaration of Performance are available on the website www.polon-alfa.com

Read the content of this manual before installation and operation. Failure to follow the recommendations contained in this manual may prove dangerous or result in a violation of applicable regulations.

POLON-ALFA S.A. is not responsible for damage caused as a result of use inconsistent with these instructions.



NOTE! POLON-ALFA reserves the right to make changes to this manual.

A worn-out product, unfit for further use, should be handed over to one of the collection points dealing with electrical and electronic equipment waste.



Table of contents

1. Purpose	4
2. Technical specification	5
3. Design	8
4. Principle of operation	9
5. Detector operating modes	10
6. Description of operation	12
7. Installation of alarm devices	13
8. Safety conditions	14
8.1. Repairs and maintenance.....	14
8.2. Working at height.....	14
8.3. Anti-dusting eye protection	14
9. Storage and transport	15
9.1. Storage	15
9.2. Transport	15

1. Purpose

SAB-3000 Addressable acoustic and optical alarm devices are available in variants listed in table below:

Designation	Acoustic type	Recommended installation height	Certificate of admission	Color of light	Color of housing
SAB-3001-3RR	Tone	3 m	Yes	Red	Red
SAB-3001-6RR		6 m			
SAB-3001-6WW		6 m	No	White	White
SAB-3006-3RR	Vocal	3 m	Yes	Red	Red
SAB-3006-6RR		6 m			
SAB-3006-6WW		6 m	No	White	White

Addressable acoustic and optical SAB-3001 and SAB-3006 alarm devices are signalling elements designed for indoor operation. They are dedicated to work in addressable loop detection line of the POLON 3000 fire alarm control panel. For proper operation, components require the presence of two supply voltages simultaneously - from detection line and external power supply.

The alarm devices are able to synchronize a group of elements working in one acoustic and visual space. The level of emitted sound and light does not change depending on the value of the supply voltage.

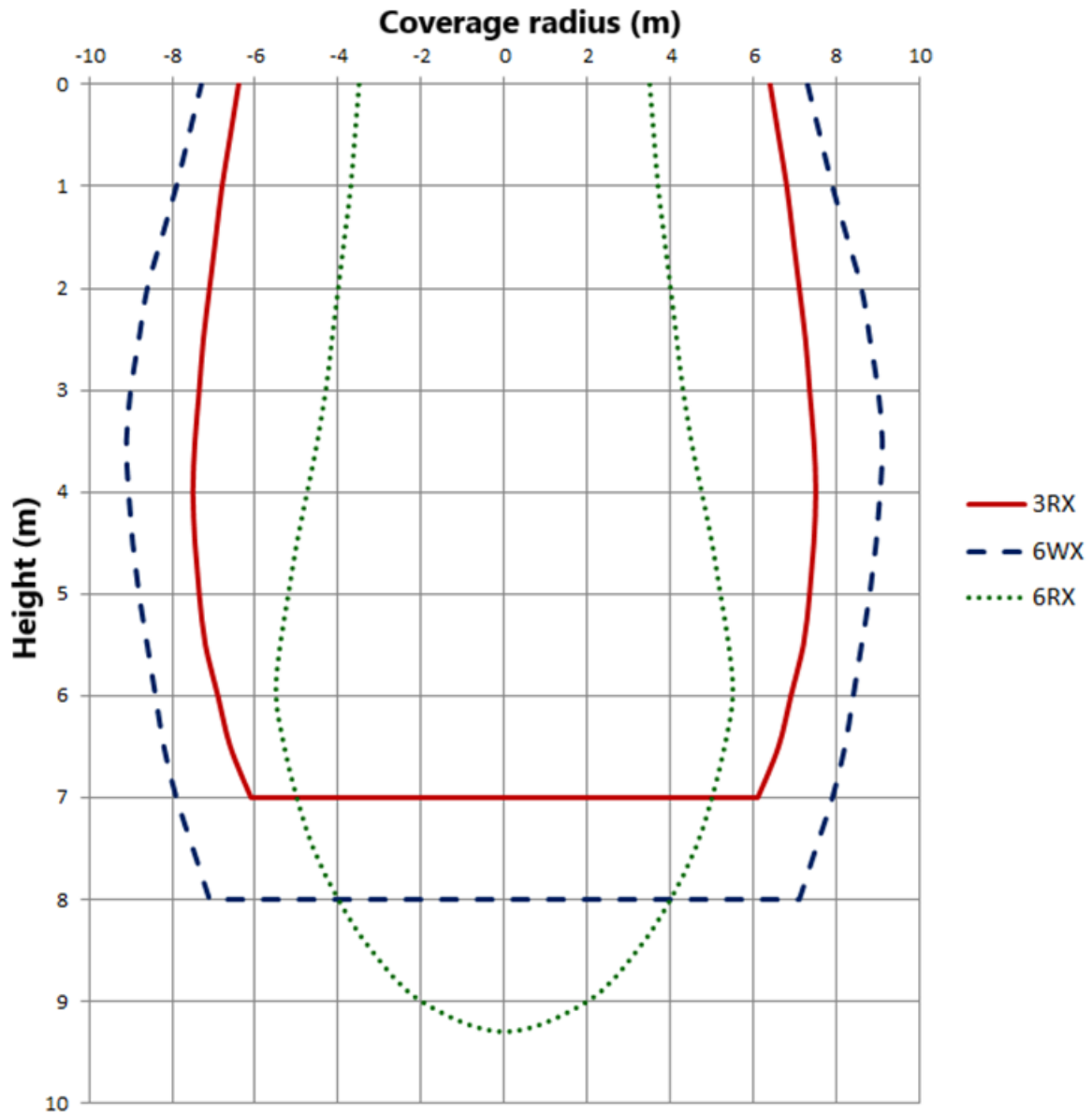
SAB-3001 and SAB-3006 are programmable devices. With the USB cable (A → MiniUSB) and dedicated software, it is possible to configure acoustic sequences specific to the requirements of a particular facility and compliant with the EN 54-3:2003 + A2:2007 standard.

The alarm devices are equipped with software-controlled short-circuit isolators.

The available alarm messages and alarm horn styles are consistent with the SAW-3000 sounders. Allowing them to be used in the same acoustic space.

2. Technical specification

Detection line operating voltage	16.5 V ÷ 24.6 V
Current consumption from detection line	≤ 150 μA
Power supply operating voltage	9.6 V ÷ 30.0 V
12 V (9.6 ÷ 16.0 V) power supply current consumption	≤ 280 mA
24 V (16.0 ÷ 30.0 V) power supply current consumption	≤ 170 mA
Power supply current consumption during supervision	< 10 mA
A-weighted sound level at a distance of 1 m	up to 103 dB
Flash rate	0.5 Hz
Flash time	0.2 s
Operating temperature range	-25 °C do +55 °C
Ingress protection	IP 21C
Dimensions (with base)	∅ 115 mm x 94 mm
Weight (with base)	0.26 kg
Address encoding	programmable from the control panel



Height of installation [m]	Coverage radius [m]		
	3RX	6WX	6RX
0	6.4	7.3	3.5
0.5	6.6	7.6	3.6
1.0	6.8	7.9	3.7
1.5	6.95	8.25	3.8
2.0	7.1	8.6	4
2.5	7.25	8.8	4.2
3.0	7.35	9	4.3

3.5	7.45	9.1	4.5
4.0	7.5	9.05	4.7
4.5	7.45	8.95	5
5.0	7.35	8.8	5.2
5.5	7.2	8.6	5.4
6.0	6.9	8.4	5.5
6.5	6.6	8.2	5.3
7.0	6.1	7.9	5
7.5		7.5	4.6
8.0		7.1	4
8.5			3.2
9.0			2

3. Design

The mechanical design of acoustic and optical alarm devices is shown in Figure 3/1. The principal component is a piezoelectric transducer, used to generate acoustic signal, as well as LED diode, with a lens placed on the front of the alarm device. The entire device is enclosed in a housing made of non-flammable plastic, which consists of a basket, a cover and a screen. The SAB-3000 (also in 3001 and 3006 versions) are installed in the G-40S base wired to the detection line and can be connected to external power supply.

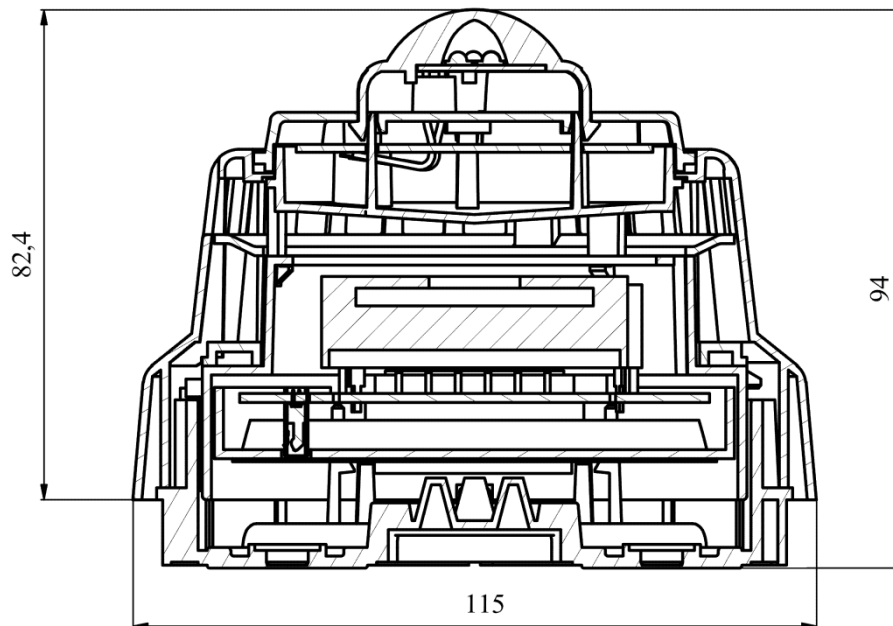


Figure 3/1 Mechanical design of the SAB-3000 alarm device

4. Principle of operation

The microprocessor controlling the alarm device verifies the correctness of operation of its elementary systems for the whole time of the supervision operation, and in case of any irregularities, it sends appropriate information to the control panel.

The control panels of POLON 3000 system communicates with SAB-3001 and SAB3006 alarm devices by means of a two-wire addressable detection line. The unique, fully digital communication protocol allows any information to be transmitted from the control panel to the alarm device and from the alarm device to the control panel.

The alarm device checks the correctness of the supply voltage and in the event of detecting any fault, it sends the appropriate information to the control panel.

The status of failure or activation of the short circuit isolator, is signalled on the control panel, and additionally, it is signalled by flashing yellow LEDs located along the perimeter of the alarm device.

SAB-3006, upon triggering an alarm, will emit the warning sequence selected during the configuration and compatible with the operating mode, and the red LEDs will flash cyclically, while monitoring the status of acoustic synchronization with other alarm devices in the POLON 3000 system. If the element detects a failure related to the signalling component, the red signalling LEDs will flash in series. While in emergency mode, the alarm device can also start emitting a default alarm signal.

If during the signalling process the detection line is damaged, the signalling continues until the power supply is off.

The alarm device is equipped with internal short-circuit isolator which cut off the operational detection line from the adjacent, short-circuited part, allowing the device to carry out further, undisturbed operation.

5. Detector operating modes

The newly purchased SAB-3006 alarm device stores several standard warning sequences in its memory (Appendix C), which consist of a warning signal and an optional voice message separated by silent pauses.



In the SAB-3001 or SAB-3006 alarm device, in case voice message is not configured, the sequence consists of a warning signal only, as the silent breaks are therefore not used. Available alarm horns are described in Appendix B. Each warning sequence, containing voice message, in accordance with the requirements of EN 54-3:2003 + A2:2007 standard, must meet the timing-related requirements, presented in the table below:

Table 5/1. Construction of the "warning sequence" according to the standard

Sound pattern	Admissible duration	Remarks
Warning signal (alarm horn)	2 s to 10 s	Pattern present in SAB-3001 and SAB-3006
Silence	0.25 s to 2 s	In SAB-3006 voice message with silent pause in option, in SAB-3001 message with silent pause unavailable
Voice message	1 sec to 27.5 sec	
Silence	0.25 s to 5 s	

To configure an alarm device, start by selecting a warning sequence relevant for the requirements of the facility where it is to be installed, or if the standard warning sequences are insufficient, creating and coding individual sequences via the USB port and dedicated software.

One of three volume levels for each selected sequences can be chosen:

- Level 3 – "nominal volume",
- Level 2 – "nominal volume -6 dB",
- Level 1 – "nominal volume -12 dB".

The current consumption of the device depends equally on type of the warning sequence, volume and the supply voltage. Recommendations for determining the current consumption in a specific case are presented in Appendix A.

The SAB-3001 alarm device does not provide the possibility of programming voice warning sequences. The sequence always consists of a warning signal only.
The visual signalling can operate independently of the acoustic signalling.

6. Description of operation

During the operation of alarm devices, prevent the formation of dew and frost on the surface of the device and protect it against excessive dust contamination.

During any renovation work, the alarm device must be removed or properly secured. If the siren is removed from the socket, it should be secured with painter's tape before painting. Elements damaged during painting and renovation works due to the fault of the persons conducting these works (e.g. painted housing of an alarm device, a grate sealed with paint...) are not subject to warranty repairs.

During operation, the SAB-3000 acoustic siren (versions 3001 and 3006) should be subjected to periodic inspection - in accordance with CEN/TS 54-14:2018 - carried out in order to determine the proper operation of the element and its correct cooperation with the control panel. The inspection should be performed at least every 12 months.

Device is equipped with a magnetic field sensor, which enables the communication test between the element with the control panel and – using the service kit - determine its location in the facility. When the tester head is placed on top of the signalling device, the sounder starts flashing yellow LED which indicates the correct communication with the control panel.

Function checks can be carried out by successively activating the sounders from the control panel. Damaged alarm devices should be delivered to the manufacturer (**POLON-ALFA S.A.**, Glinki 155 , 85-861 Bydgoszcz, POLAND) for repair.

Note!

By any means, the alarm device must not be dismantled by the user, installer and maintenance technician. The alarm devices can be installed by authorised installer only.

7. Installation of alarm devices

The SAB-3001 and SAB 3006 alarm devices shall be installed (height, positioning) in accordance with the specified design guidelines. They are installed in facilities where any appearance of fire should be signalled.

The alarm devices operate in closed loop lines, closed loop lines with straight branching or in radial detection lines of the POLON 3000 system (see Operation and Maintenance Manual for the POLON 3000 control panel). They are installed in G-40S bases. The cables of the alarm system shall be laid in accordance with the regulations applicable for low-voltage installations (below 42 V).

The wiring to the base is the same as for the detectors of the 3000 series, but instead of the remote indicator terminals an external 12 or 24 VDC power supply unit can be connected.

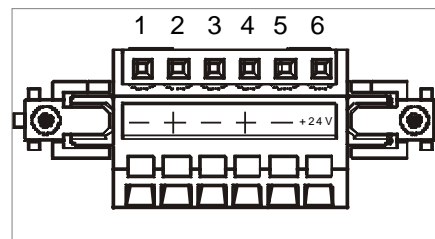
The SAB-3001 and SAB-3006 sounder beacons shall be installed (height, positioning) in accordance with the specified design guidelines. They are installed in facilities where any appearance of fire should be signalled.

The sirens operate in loop lines, loop lines with straight branches or in beam detection lines of POLON 3000 systems (see the Technical and Operational Documentation of POLON 3000 control panels). They are installed in G-40S sockets. The wires of the alarm system are laid in accordance with the regulations applicable to low-voltage installations (below 42 V).

Connecting the cables to the socket is analogous to that of the 3000 series detectors, but in place of the tripping indicator terminals, an external power supply with a voltage of 12 or 24 VDC should be connected.

Terminal designation in the socket:

- "1" – negative of the detection line input
- "2" – +LD (Detection Line Input)
- "3" – negative of the detection line output
- "4" – +LD (detection line output)
- "5" – power supply ground
- "6" – +24 V power supply



Due to no time synchronization support, the sirens in the POLON 3000 system should not operate in a single acoustic space (applies only to voice sirens) or visual space in accordance with the requirements of the standard .

Note!

The alarm devices should not be installed in a corrosive environment containing corrosive gases, vapours or dust. Condensation on acoustic signalling devices is not permitted.

8. Safety conditions

8.1. Repairs and maintenance

Maintenance works and periodic inspections must be carried out by authorized personnel of companies trained or approved by POLON-ALFA.

All repairs must be carried out by the manufacturer.

POLON-ALFA shall not be held liable for the operation of equipment maintained and repaired by unauthorized personnel.

8.2. Working at height

Work at height related to the alarm devices installation must be carried out with utmost caution using operational equipment and tools.

Particular attention must be paid to the stability of ladders, lifts, etc.

Power tools shall be used in accordance with the conditions for their safe operation specified in the relevant manufacturer's instructions.

8.3. Anti-dusting eye protection

Use protective goggles and dust masks when carrying out works that generate a lot of dust, especially when drilling holes in ceilings to fix the sockets for the alarm devices.

9. Storage and transport

9.1. Storage

The SAB-3000 alarm devices should be stored in closed rooms where no vapours and corrosive gases occurs, the temperature is in the range of 0 °C to + 40 °C, and the relative humidity does not exceed 80 % at a temperature of + 35 °C.

During storage, the alarm device should not be exposed to direct sunlight or heat from heating equipment.

The period of storage in the shipping packaging should not exceed 6 months.

9.2. Transport

The SAB-3000 alarm devices should be transported in confined spaces of the transport means, in packaging corresponding to the requirements of the applicable transport regulations.

The temperature during transport should not be lower than – 40 °C nor higher than + 70 °C, and the relative humidity should not exceed 95 % at + 45 °C or 80 % at + 70 °C.

Appendix A

(informative)

Table A/1. Maximum current consumption of the alarm device acoustic alarm mode.
Values expressed in mA.

Number of Alarm horn	Power supply 12 V (9.6 V ÷ 16.0 V)			Power supply 24 V (16.0 V ÷ 30.0 V)		
	Volume -12 dB	Volume -6 dB	Nominal Volume	Volume -12 dB	Volume -6 dB	Nominal Volume
1	35	40	50	35	35	40
2	35	40	55	35	35	45
3	35	40	45	35	35	40
4	35	35	45	35	35	40
5	35	40	45	35	35	40
6	35	40	55	35	35	45
7	35	40	50	35	35	45
8	35	40	60	35	35	45
9	40	55	135	35	45	85
10	40	50	120	35	40	75
11	40	60	190	35	50	115
12	40	55	140	35	45	90
13	35	40	75	35	40	60
14	35	40	55	35	35	45
15	35	40	60	35	35	45
16	40	55	140	35	45	90

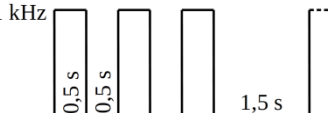
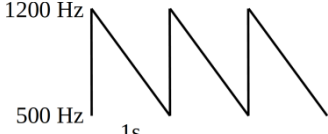

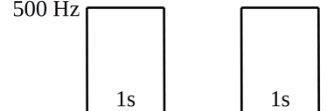
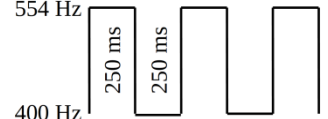
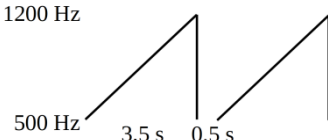
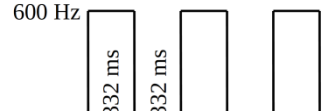
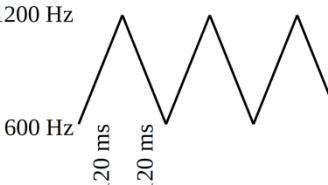

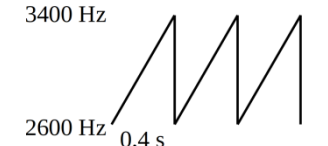
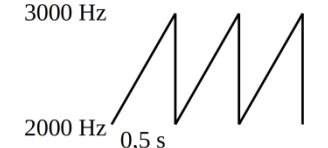
For visual signalling 55 mA for the power supply (16.0 V ÷ 30.0 V) and 90 mA for the power supply (9.6 V ÷ 16.0 V) should be added.

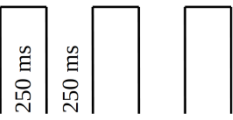
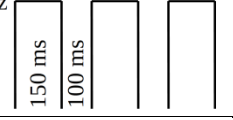
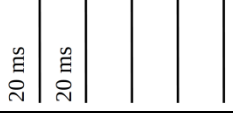
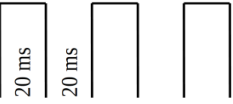
If the SAB-3006 alarm device emits a warning signal with a voice message, the maximum power consumption should be considered to be the value for horn No. 11.

Appendix B

(informative)

Table B/1. Standard alarm horns

No	Sound pattern	
1	Intermittent tone, Emergency evacuation signal as per ISO 8201	 <p>1 kHz 0,5 s 0,5 s 1,5 s</p>
2	A 'sawtooth' descending tone, Unified alarm signal as per DIN 33404-3	 <p>1200 Hz 500 Hz 1s</p>
3	Fixed frequency, Emergency evacuation signal as per BS 5839-1	 <p>500 Hz</p>
4	Intermittent tone alarm signal as per BS 5839-1	 <p>500 Hz 1s 1s</p>
5	Step variation of frequency, Emergency evacuation tone as per NF S32-001	 <p>554 Hz 400 Hz 250 ms 250 ms</p>
6	A 'sawtooth' ascending tone, Emergency evacuation signal as per NEN 2575	 <p>1200 Hz 500 Hz 3,5 s 0,5 s</p>
7	Intermittent tone, warning signal as per SS 03 17 11	 <p>600 Hz 332 ms 332 ms</p>
8	A 'triangular' tone, the frequency cyclically rises and falls, modified "PIES MODULATION"	 <p>1200 Hz 600 Hz 120 ms 120 ms</p>
9	Intermittent tone of 2600 Hz frequency	 <p>2600 Hz 100 ms 130 ms</p>
10	A 'sawtooth' ascending tone	 <p>3400 Hz 2600 Hz 0,4 s</p>
11	A 'sawtooth' ascending tone	 <p>3000 Hz 2000 Hz 0,5 s</p>

12	Intermittent tone of 2500 Hz frequency	2500 Hz 
13	Intermittent tone of 3300 Hz frequency	3300 Hz 
14	'Phone ring' tone	800 Hz 
15	Constant frequency tone of 800 Hz	800 Hz —————
16	Package of 13 20 ms/20ms pulses of 2500 Hz frequency, 0,5 s break	2500 Hz 

Tones numbered 1 to 6 are compliant with appendix D to EN 54-3:2014-12.

Table B/2. Minimum sound levels for tone signals

No	15°	45°	75°	105°	135°	165°
1	80 dB	86 dB	93 dB	92 dB	83 dB	82 dB
2	90 dB	91 dB	96 dB	96 dB	88 dB	93 dB
3	85 dB	86 dB	91 dB	91 dB	82 dB	85 dB
4	85 dB	86 dB	91 dB	91 dB	82 dB	84 dB
5	84 dB	88 dB	93 dB	92 dB	85 dB	85 dB
6	90 dB	91 dB	98 dB	96 dB	88 dB	92 dB
7	80 dB	88 dB	90 dB	88 dB	85 dB	85 dB
8	90 dB	92 dB	98 dB	96 dB	88 dB	92 dB
9	94 dB	95 dB	103 dB	102 dB	91 dB	88 dB
10	95 dB	95 dB	103 dB	103 dB	91 dB	90 dB
11	95 dB	96 dB	103 dB	102 dB	91 dB	93 dB
12	96 dB	96 dB	103 dB	103 dB	91 dB	92 dB
13	87 dB	95 dB	99 dB	99 dB	91 dB	91 dB
14	95 dB	93 dB	101 dB	100 dB	87 dB	94 dB
15	85 dB	89 dB	91 dB	91 dB	86 dB	85 dB
16	95 dB	94 dB	100 dB	100 dB	87 dB	93 dB

Appendix C

(informative)

Table C/1. Standard alarm sequences for a voice signalling device in Polish.

Sequence no.	Alarm signal	Voice message content
1	Quick 2.6 kHz pulses every 0.13 s	"Attention, attention! I announce a fire alarm. Please follow the evacuation plan."
2	Step variation of frequency switching between two 54/440 Hz tones every 0.5 s	"Attention, attention! A fire has been detected in the building, please follow the fire safety instructions"
3	Rising frequency change from 2.0 kHz to 3 kHz	None

Note!

As default, sequences 4 – 16 are not programmed in the alarm device's memory, hence if chosen, the alarm device will emit error signal (alarm no. 1).

Table C/2. Minimum audio levels for voice sequences

Sequence number	15°	45°	75°	105°	135°	165°
1	94 dB	96 dB	103 dB	103 dB	90 dB	91 dB
2	83 dB	90 dB	93 dB	93 dB	86 dB	84 dB



POLON-ALFA S.A.

POLAND 85-861 Bydgoszcz, ul. Glinki 155 | www.polon-alfa.com
EXPORT DEP. phone no. +48 52 36 39 278, e-mail: export@polon-alfa.pl
SERVICE DEP. phone no. +48 52 36 39 390, e-mail: serwis@polon-alfa.pl