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CENTRUM NAUKOWO-BADAWCZE OCHRONY PRZECIWOŻAROWEJ
im. Józefa Tuliszkowskiego
PAŃSTWOWY INSTYTUT BADAWCZY

TECHNICAL OPINION No. OT-001/2021

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Series:
Technical Opinions

CNBOP-PIB TECHNICAL OPINION No. OT-001/2021

Centrum Naukowo-Badawcze Ochrony Przeciwpozarowej – Państwowy Instytut Badawczy at the request of:

ic audio GmbH

Boehringerstraße 14a

D-68307 Mannheim, Federal Republic of Germany

states suitability for use in fire protection, within the scope and on the terms specified in this CNBOP-PIB

Technical Opinion, of the product under the name of:

Loudspeaker type DL-BR-SUB 120/T-EN54

Manufactured by:
ic audio GmbH
Boehringerstraße 14a
D-68307 Mannheim, Federal Republic of Germany

Validity period:
from September 28, 2021
until September 27, 2024



CNBOP-PIB Director

st. bryg. Paweł Janik, PhD Eng.

Józefów, September 28, 2021

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1. DEFINITIONS AND SYMBOLS

1.1. Definitions

Voice alarm system, VAS

A system for broadcasting warning signals and voice messages for the safety of people staying in the facility.

Sound:

An acoustic wave propagating in a gaseous, liquid or solid elastic medium (elastic waves) causing a subjective auditory sensation in humans or animals. The frequencies of the waves that are audible to humans lie between the limits of approximately 16 Hz to approximately 20 kHz.

Loudspeaker:

A kit consisting of at least one electro-acoustic transducer, at least one housing, a ceramic terminal block with a thermal fuse for connecting cables, and optionally devices such as filters, transformers and any other passive components.

Maximum sound pressure level for the loudspeaker

Total sound pressure level 4 meters from the reference point on the loudspeaker reference axis to which the simulated program signal is delivered at rated power.

Rated power of the loudspeaker:

Electric power calculated according to the formula U_n^2/R , where U_n is the rated noise voltage and R – the rated impedance. For transformer loudspeakers, the power rating is the highest power setting specified by the manufacturer.

Rated voltage of the loudspeaker:

RMS voltage of the simulated program signal specified by the manufacturer that the loudspeaker can accept without thermal or mechanical damage.

Loudspeaker loop

A line for transmitting the signal to one or more loudspeakers connected at both ends.

PA/VA system

VAS, in which alarm functions are combined with functions other than alarm.

1.2. Symbols:

Not applicable



2. SUBJECT OF THE TECHNICAL OPINION

2.1. General technical characteristics of the product

The subject of this Technical Opinion is a "Loudspeaker type DL-BR-SUB 120/T-EN54" (ceiling, subwoofer). The task of the loudspeaker is to transmit and broadcast warning signals and alarm messages in the PA/VA system.

2.2. Classification

The Technical Opinion refers to one type of the product:

2.2.1. DL-BR-SUB 120/T-EN54



Photo No. 1. Loudspeaker type DL-BR-SUB 120/T-EN54.
Source: CNBOP-PIB.



Photo No. 2. Loudspeaker type DL-BR-SUB 120/T-EN54.
Source: CNBOP-PIB.



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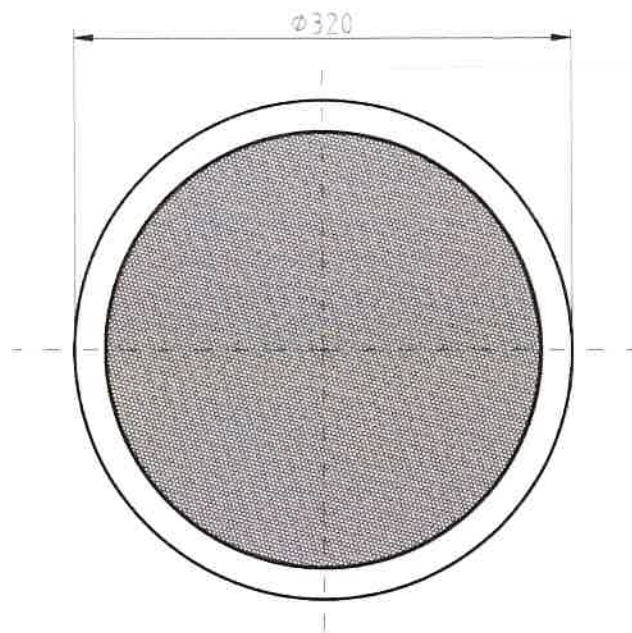


Fig. No. 1. Overall dimensions of the loudspeaker type DL-BR-SUB 120/T-EN54.
Source: Manufacturer's materials.

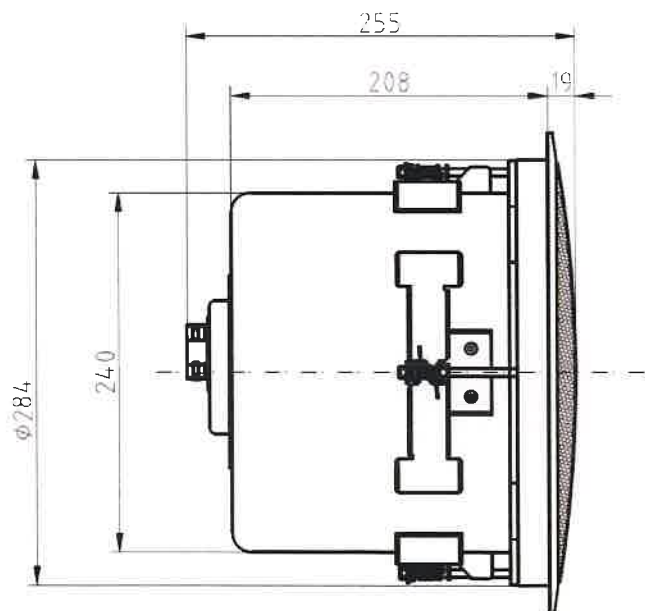


Fig. No. 2. Overall dimensions of the loudspeaker type DL-BR-SUB 120/T-EN54.
Source: Manufacturer's materials.

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2.3. Markings

The marking of loudspeakers type DL-BR-SUB 120/T-EN54 consists of the following data:

- device type,
- serial number,
- manufacturer's name.

2.4. Name and address of the manufacturing plant

Address of the manufacturing plant:

ic audio GmbH

Boehringerstraße 14a

D-68307 Mannheim, Federal Republic of Germany



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3. INTENDED USE, SCOPE, CONDITIONS OF USE AND RESTRICTIONS

3.1. Intended use

In accordance with the manufacturer's declaration, DL-BR-SUB 120/T-EN54 loudspeakers are intended for PA/VA systems as supplementary loudspeakers for loudspeaker lines.

3.2. Installation

DL-BR-SUB 120/T-EN54 loudspeakers should be installed, assembled and commissioned according to the manufacturer's instructions and the applicable technical specifications or national regulations.

3.3. Scope, conditions of use and restrictions

DL-BR-SUB 120/T-EN54 loudspeakers may only be used as supplementary loudspeakers. This Technical Opinion does not replace any national regulations regarding the possibility of placing the product on the market or using it.

The basis for using the loudspeakers should be a risk analysis and assessment performed, for example, according to one of the specifications *CEN/TS 54-32:2015: Fire detection and fire alarm systems – Part 32: Planning, design, installation, commissioning, use and maintenance of voice alarm systems* or *ISO 7240-19:2007 Fire detection and alarm systems – Part 19: Design, installation, commissioning and service of sound systems for emergency purposes* or *BS 5839-8:2013 Fire detection and fire alarm systems for buildings – Part 8: Code of practice for the design, installation, commissioning and maintenance of voice alarm systems*.

The parameters of the product are listed in Tables No. 1, No. 2 and No. 3. The results of measuring the sound pressure of one of the three tested samples in relation to the frequency are shown in diagram 1.

Table No. 1. Electrical parameters.

ELECTRICAL PARAMETERS	
	DL-BR-SUB 120/T-EN54
Line voltage [V]	100
Impedance [Ω]	4
Transformer type	BQ-135SC-111
Rated impedance for transformer terminals	83 / 167 / 333 / 667

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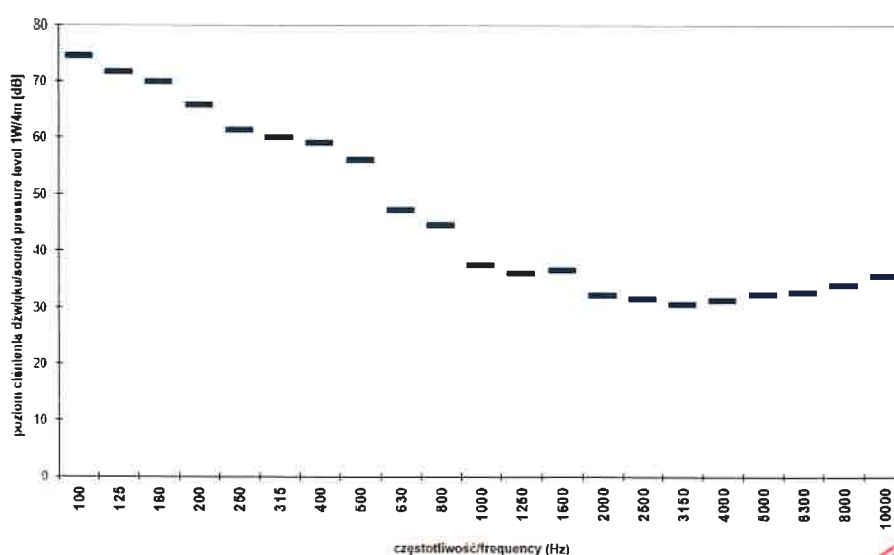


Table No. 2. Mechanical parameters.

MECHANICAL PARAMETERS	
	DL-BR-SUB 120/T-EN54
IP protection	IP21C
Housing material	plastic
Dimensions [mm]	255 x 284 x 320
Mass [g]	6640
Flammability of the housing material	5VB

Table No. 3. Performance parameters.

PERFORMANCE PARAMETERS	
	DL-BR-SUB 120/T-EN54
Maximum sound pressure level [dB]	82
Sensitivity [dB]	75
Rated power voltage [V]	100
Rated power [W]	120

Diagram No. 1. Results of the sound pressure measurement in relation to frequency.
Source: CNBOP-PIB.

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4. TECHNICAL PROPERTIES, REQUIREMENTS

4.1. Construction of the product

Execution of individual elements of type DL-BR-SUB 120/T-EN54 loudspeaker should be careful and its assembly should be in accordance with the technical documentation and technological assembly instructions.

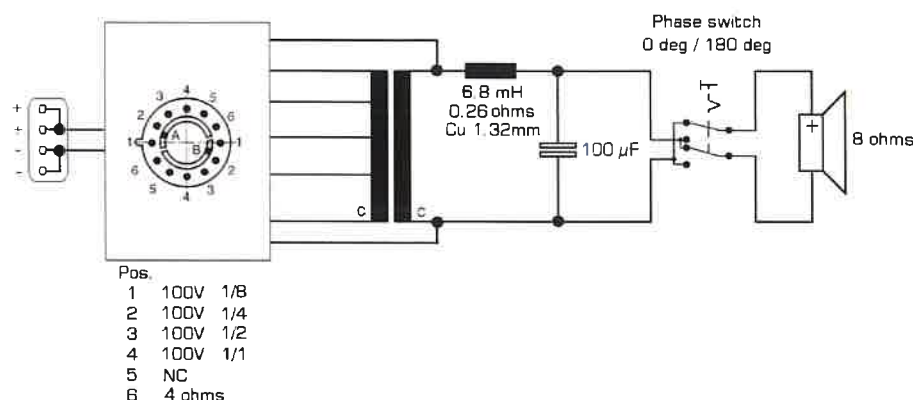


Fig. No. 3. Electrical diagram of the loudspeaker.
Source: Manufacturer's materials.

4.2. Technical and environmental requirements

DL-BR-SUB 120/T-EN54 loudspeakers should meet the requirements described in Table 5, subject to the admissibility of a difference in rated power exceeding ± 3 dB and the frequency response of a subwoofer, outside the normative chart.

Table 5. Technical and environmental requirements.

No.	Test	Requirement
1	Durability	pt. 4.3 of PN-EN 54-24:2008 * / **
2	Construction	pt. 4.4 of PN-EN 54-24:2008
3	Marking and data	pt. 4.5 of PN-EN 54-24:2008
4	Rated impedance	pt. 5.3 of PN-EN 54-24:2008
5	Maximum sound pressure level	pt. 5.5 of PN-EN 54-24:2008
6	Rated noise power (durability)	pt. 5.6 of PN-EN 54-24:2008 * / **
7	Enclosure protection	pt. 5.18 of PN-EN 54-24:2008 * / **

* rated power difference exceeding ± 3 dB

** frequency response specific to a subwoofer, outside the normative diagram.

4.3. Fulfilment of the requirements

Fulfilment of the requirements described in points 4.1 and 4.2 by the "DL-BR-SUB 120/T-EN54 loudspeaker" has been confirmed by the positive results of product tests carried out in: Zespół Laboratoriów Sygnalizacji Alarmu Pożaru i Automatyki Pożarniczej (*Laboratory of Fire Alarm Systems and Fire Automation - BA*), Centrum Naukowo-Badawcze Ochrony Przeciwpożarowej – Państwowy Instytut Badawczy, ul. Nadwiślańska 213, 05-420 Józefów, Republic of Poland. Test reports are listed in chapter 9 "Additional information".

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5. PACKING, STORAGE, TRANSPORT

5.1. Packing

DL-BR-SUB 120/T-EN54 loudspeaker should be placed in a unit package (according to the construction documentation), and then in a transport package, limiting the possibility of free movement and protecting it against damage during reloading and transport.

The following information should be provided on the transport packaging:

- manufacturer's name and mark,
- name, type of product.

5.2. Storage

DL-BR-SUB 120/T-EN54 loudspeaker should be stored in closed rooms with a temperature from -10°C to $+55^{\circ}\text{C}$ and relative humidity up to 90%, free from volatile sulphur compounds as well as acid and alkali vapours. DL-BR-SUB 120/T-EN54 loudspeaker should not be exposed to direct sunlight, ultraviolet rays and heating devices.

5.3. Transport

Transport of DL-BR-SUB 120/T-EN54 loudspeakers packed in accordance with point 5.1 can be done by any means of transport. DL-BR-SUB 120/T-EN54 loudspeakers should be protected against the possibility of mechanical damage and the effects of temperatures lower than -20°C and higher than $+50^{\circ}\text{C}$ and relative humidity higher than 90%, in accordance with the requirements of applicable transport regulations.



6. MARKING THE PRODUCT WITH THE “CNBOP-PIB TECHNICAL OPINION” MARK

6.1. General provisions

Within the period of validity of the opinion, the applicant may mark the product covered by this CNBOP-PIB Technical Opinion with: “CNBOP-PIB TECHNICAL OPINION” mark, the pattern of which is presented in drawing 1.

CNBOP-PIB TECHNICAL OPINION mark can be placed:

- directly on the product or on a label affixed thereto in a visible, legible and indelible manner. Below the mark, the number of this CNBOP-PIB technical opinion should be placed. If it is technically impossible to mark the product in the manner specified above, the marking shall be placed on the unit packaging or collective packaging of the product or on the commercial documents accompanying the product.
- and/or on the product data sheet, product instruction manual and other commercial documents accompanying the product.

6.2. Example of “CNBOP-PIB TECHNICAL OPINION” mark



Dwg. No. 1. Example of “CNBOP-PIB TECHNICAL OPINION” mark.
Source: CNBOP-PIB own elaboration.

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7. FORMAL ARRANGEMENTS

- 7.1. Technical Opinion No. OT-002/2021 is a voluntary document stating the suitability of the product: **“Loudspeaker type DL-BR-SUB 120/T-EN54”** for use in fire protection and/or civil protection within the scope resulting from the provisions of this Technical Opinion.
- 7.2. Technical Opinion OT-002/2021 confirms a positive assessment of the product as an electrical device, such as is produced by the Manufacturer and which has been submitted for an opinion by the Applicant.
- 7.3. The Technical Opinion is not a document authorizing the product to be marked with a mark other than the one presented in Chapter 6 of this Technical Opinion.
- 7.4. The product should be delivered to the recipient in compliance with conditions regarding packaging, storage and transport specified in chapter 5 of this Technical Opinion. This condition applies to the Supplier at all stages of product distribution from the manufacturer to the end recipient.
- 7.5. The Technical Opinion does not release the manufacturer from liability for the quality of the product, each batch of the product and its individual copies, and the contractors of construction works from liability for their proper use.
- 7.6. During the validity period of the opinion, the content of the issued prospectuses and announcements as well as other documents related to the product covered by this Technical Opinion may include information about CNBOP-PIB Technical Opinion No. OT-002/2021 issued to this product.
- 7.7. CNBOP-PIB Technical Opinion does not violate the rights resulting from the provisions on the protection of industrial property, in particular the Act of 30 June 2000 on Industrial Property Law (Polish Journal of Laws: Dz. U. 2001 Nr 49 poz. 508 as amended). It is the responsibility of the user of this Technical Opinion to ensure these rights.
- 7.8. The manufacturer is responsible for checking whether the solution being the subject of the Technical Opinion does not infringe the rights of third parties.
- 7.9. The manufacturer is responsible for any damage caused to anyone as a result of a defective product.
- 7.10. By providing the Technical Opinion, CNBOP-PIB shall not be liable for any infringement of exclusive and acquired rights.
- 7.11. CNBOP-PIB may amend this Technical Opinion at the request of the owner of the opinion.
- 7.12. CNBOP-PIB Technical Opinion may be revoked by CNBOP-PIB in the event of changes to separate regulations, standards, scientific bases and the state of technical and practical knowledge, and failure to confirm the suitability of the product for a given application during use. The Technical Opinion may be revoked on CNBOP-PIB's own initiative or at the request of the opinion owner.

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8. VALIDITY PERIOD

CNBOP-PIB Technical Opinion OT-002/2021 is valid from 27 September 2021 to 27 September 2024.

The validity of CNBOP-PIB Technical Opinion may be extended at the request of its owner, if the owner submits a relevant request to Centrum Naukowo-Badawcze Ochrony Przeciwpozarowej – Państwowy Instytut Badawczy, no later than 3 months before the expiry date of this document.



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9. ADDITIONAL INFORMATION

9.1. Standards and related documents

1. **PN-EN 54-24:2008**
Fire detection and fire alarm systems – Components of voice alarm systems. Loudspeakers
2. **PN-EN 60695-11-20:2002+A1:2005**
Fire hazard testing – Test flames. 500 W flame test methods
3. **PN-EN 60529:2003**
Degrees of protection provided by enclosures (IP Code)

9.2. Test reports, reports, assessments and classifications used in the proceedings

Table No. 6. Test reports used in the opinion-making process



Test report No.:	Test report issued by:
1. 1684/BA/19 of 5 December 2019	Zespół Laboratoriów Sygnalizacji Alarmu Pożaru i Automatyki Pożarniczej (Laboratory of Fire Alarm Systems and Fire Automation – BA) Centrum Naukowo-Badawcze Ochrony Przeciwpożarowej Państwowy Instytut Badawczy ul. Nadwiślańska 213 05-420 Józefów, Republic of Poland
2. Test protocol of 16 November 2019	Zespół Laboratoriów Procesów Spalania i Wybuchowości (Laboratory of Combustion Processes and Explosions – BW) Centrum Naukowo-Badawcze Ochrony Przeciwpożarowej Państwowy Instytut Badawczy ul. Nadwiślańska 213 05-420 Józefów, Republic of Poland

9.3. Documentation

Table No. 7. Extract from the documentation of 002/OT/2021 process

No.	Name of document	Document number	Date
1	Application for Technical Opinion No. 002/OT/2021	not applicable	26.08.2021
2	Test report	1684/BA/19	05.12.2019
3	DL-BR-SUB 120/T-EN54 Data sheet	not applicable	26.02.2021
4	Parameter card	not applicable	10.04.2019
5	Technical drawing – Zusammenbau DL-BR-SUB 120/T-EN54	not applicable	14.02.2019
6	Technical drawing – BQ-135SC8-111	not applicable	13.02.2019

END OF TECHNICAL OPINION

Technical Opinion prepared by	Robert Śliwiński, M.A., Eng. Title or an equivalent term, name and surname	September 28, 2021  Date, signature
Technical Opinion authorised by	Konrad Zaciera, M.A. Eng. Title or an equivalent term, name and surname	September 28, 2021  Date, signature

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