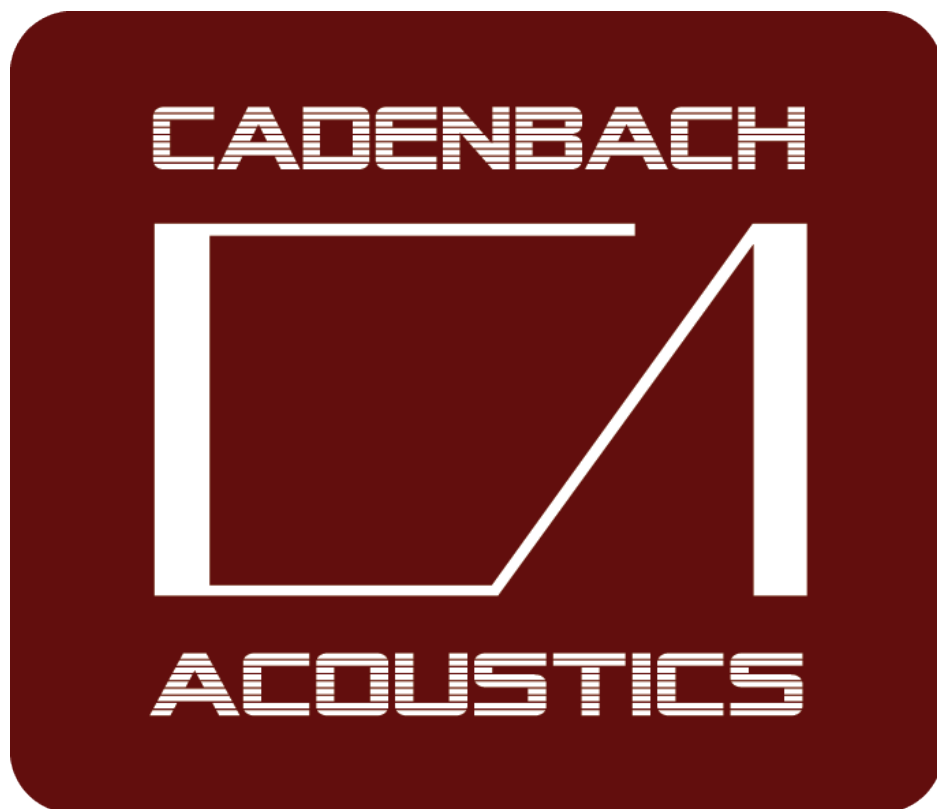


# MINERVA

Manual volume: E 0.0



**YOU ART. WE SOUND.**

# MINERVA 10 inch FIR point source loudspeaker

## Safety precautions

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### **Potential risk of personal injury**

Never stand in the direct sound beam close to a loudspeakers driven at a high level. Professional loudspeaker systems can cause sound pressure levels that could harm human health. Noncritical sound levels at about 90 dB can cause hearing damage if people are exposed to it over a longer period.

In order to prevent accidents when deploying loudspeakers on the ground or when flown, please take note of the following:

- When setting up the loudspeakers or loudspeaker stands, make sure they are standing on a firm surface. If you place several systems on top of one another, use straps to secure them against movement.
- Only use accessories which have been tested and approved by Cadenbach Acoustics for assembly and mobile applications. Pay attention to the correct application and maximum load capacity of the accessories.
- Ensure that all additional hardware, fixings and fasteners used for installation or mobile use are of an appropriate size and load safety factor. Pay attention to the manufacturers instructions and to the relevant safety guidelines.
- Regularly check the loudspeaker housings and accessories for visible signs of wear and tear, and replace them when necessary.
- Regularly check all load bearing bolts in the mounting devices.

### **Potential risk of material damage**

Loudspeakers produce a static magnetic field even if they are not connected or not in use. Therefore make sure when erecting and transporting loudspeakers that they are not near equipment and objects which may be impaired or damaged by an external magnetic field.

#### **WARNINGS ON THE SPEAKERS BACK PLATE:**

**THIS EQUIPMENT CAN GENERATE EXTREME SOUND PRESSURE LEVELS THAT CAN LEAD TO PERMANENT HEARING DAMAGE.**

**THIS SURFACE MAY REACH HIGH TEMPERATURES WHILE IN USE.**

**TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.**

**NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.**

**ONLY PERSONAL CERTIFIED TO BE TRAINED BY CADENBACH ACOUSTICS, HAVING PASSED S1 COURSE SHOULD SETUP THIS SYSTEM, OTHERWISE ANY WARRANTY IS VOID. SEE CORRESPONDING MANUAL.**

**MADE IN GERMANY / EU**

# MINERVA 10 inch FIR point source loudspeaker

## Product description



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### Overview

MINERVA is a point source loudspeaker with rotatable and interchangeable Horn in a trapezoid design. MINERVA offers four 8 mm inserts for mounting. Even full active equipped MINERVA is still light weight and offers in all versions more than 133 dB SPL at 1 meter. This enables the system to be used as main Loudspeaker system either as single speaker or in multiple horizontal and also vertical speaker array arrangement.

MINERVA was designed for wide range natural sound reproduction, whether using the speaker vertically or horizontally the Mid to High frequency 65° by 40° (95° x 55° when ordering MINERVA9) CD horn delivers constant directivity and dispersion control and can be rotated into either the horizontal or vertical plane.

The construction of the 10 inch Low frequency neodymium cone with its 2.5 inch voice coil and Mid To High 1.5 inch exit driver section offers phase coherence between both chassis around crossover point of more than 4 octaves, creating a remarkable point source behaviour. The ring radiator design of the Mid to High compression driver has got a 1.75 inch voice coil delivering extra high excursion possibilities and radiates distortion free sound also above 16 kHz.

TEUTATES is the dedicated low frequency extension, anyway all cadenbach acoustic sub woofers can be chosen to run with MINERVA.

On order MINERVA incorporates a very power full frequency modulated floating modulator amplifier. Due to its advanced high efficiency power technology it runs at any moment at very low temperature and needs no fan cooling at all.

### Operation

The frequency and phase response of MINERVA is exceptional smooth at very low THD. MAGNA can run passive but needs some frequency correction of a controller and it can run in linear phase mode by using Cadenbach Acoustics **FIR filter** of the HEIMDALL D1 digital controller. Its rotatable and interchangeable horn offers full CD dispersion control in horizontal and vertical point source mode.

### Applications

- Small concert halls, theatres and houses of worship, AV applications.
- Small to medium main system sound reinforcement.
- Side or front fill system, under balcony or distributed system.

### Features

- Trapezoid design with wide range output, with optional integrated amplifier
- Optimal integration with TEUTATES sub woofer.
- Very flexible CD coverage via rotatable, replaceable Horn and Cadenbach Acoustics FIR filters.
- Four 6 mm inserts for various flown configurations

# MINERVA 10 inch FIR point source loudspeaker



Data

## Technical Specifications

### Transducers

- Low frequency: **10 inches** (254 mm) Neodymium
- High frequency: **1.5 inches** (38 mm) Neodymium

Voice coil size and impedance

- Low frequency: **2.5 inches** (64 mm) Al, 8 ohms
- High frequency: **1.75 inches** (44.4 mm) Cu, 16 ohms

Diaphragm size

- High frequency: **1.75 inches** (44.4 mm) Polyester

Exit size

- High frequency: **1.5 inches** (38 mm) port

### Nominal Impedance

- Low frequency: **8 ohms**
- High frequency: **16 ohms**
- Passive: **8 ohms**  
Z = 8 ohms

### Output at 1m

- **135 dB SPL** ( 3 )  
driven with PAX P16 134 dB  
driven with internal amps 134 dB
- MINERVA9: **134 dB SPL** ( 3 )  
driven with PAX P16 133 dB  
driven with internal amps 133 dB

### Sensitivity (SPL at 1m)

- Low frequency: **106 (300 Hz) dB / 131 dB**  
cont. at 400 watts
- High frequency: **115 (1.5 kHz) dB / 134 dB**  
cont. at 80 watts
- Passive: **106 (300 Hz) dB / 128 dB**  
cont. at 400 watts

### Power Handling

- Low frequency: **1500 watts** peak  
400 watts AES  
800 watts program  
rec. amp power on 4 ohms  
2800 watts
- High frequency: **450 watts** peak  
80 watts AES  
240 watts program  
rec. amp power on 4 ohms  
2800 watts
- Passive: **1200 watts** peak  
600 watts AES  
900 watts program  
rec. amp power on 4 ohms  
2800 watts

### Crossover type and frequency

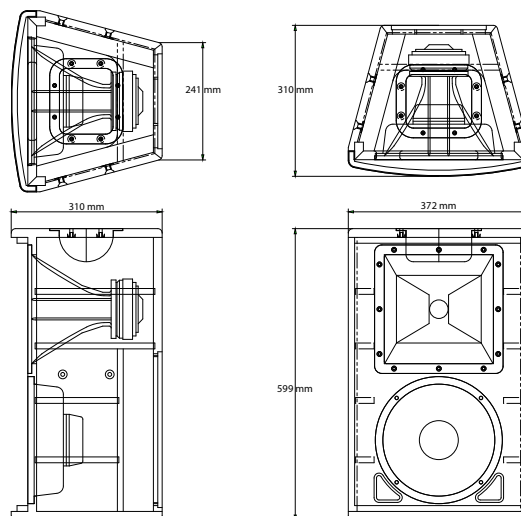
- Filter type active: **FIR zero phase**  
Low to Mid High: **1.1 - 1.6 kHz**
- Filter type passive: **NONE / IIR / FIR zero phase**  
Low to Mid High: **1.5 kHz**
- Sub to Low: **70 Hz - 130 Hz**

### Frequency and Phase response

- Usable frequency range: **58 Hz - 22 kHz** ( 1 )
- Free field frequency response: 78 Hz - 19.5 kHz  
(-5 dB) linearity (+/- 0.5 dB)  
passive with IIR filter (+/- 2 dB)
- Phase response: **0° +/- 2°**  
from 280 Hz to 21.5 kHz  
passive with IIR:  
180° to - 180° from 77 Hz to 17 kHz

### Size and weight

- Height: **23.58 inches** (599 mm)
- Width: **14.65 inches** (372 mm)
- Depth: **12.20 inches** (310 mm)
- Weight:  
**44.09 lbs** (20 kg) passive model  
**52.91 lbs** (24 kg) active model



### Coverage

- Horizontal coverage:  
65° rotatable  
MINERVA9: 95° rotatable
- Vertical coverage:  
40° rotatable  
MINERVA9: 55° rotatable

### Speakers per PAX P16 channel

- For passive model:  
**2 / 3** ( 2 ) parallel via link

### Connection

- For passive model:  
**2 x NL4** (1+/1- passive, 2+/2- link)

( 1 ) Full-range mode, providing 113 dB @ 52 Hz

( 2 ) possible only with short length cables.

( 3 ) SPL max peak, test signal: pink noise with crest factor 6 dB.

# MINERVA 10 inch FIR point source loudspeaker



## Data

### Technical Specifications

#### Internal Amp module

- Type of output stage: free floating modulator FM out put power stage
- Total output Power and Volts: into 8 ohms  
Music: **2 x 2800 watts** at **150 V<sub>pk</sub>**  
RMS: **2 x 1400 watts** at **106 V**  
iMINERVA  
into 6 ohms  
Music: **1 x 1200 watts** at **87 V** peak  
RMS: **1 x 620 watts** at **61 V** rms
- Low frequency:  
**2800 watts** peak / 1400 watts rms
- High frequency:  
**1400 watts** peak / 700 watts rms
- iMinerva:  
**1200 watts** peak / 620 watts rms

#### Audio specifications

- IM: **0,05%** (SMPTE)
- DIM: **0,005%** (DIM 100)
- THD: **0,02%** (+N 20 Hz - 20 kHz)

#### Audio input Connection

- XLR 5 pin, (iMINERVA XLR 3 pin)  
female in and male link out  
5pin: 1g, 2 LF+, 3 LF-, 4 HF+, 5 HF-,  
3pin: 1g, 2 +, 3 -

#### Audio input Impedance

- 20 kOhms symmetric (between + and -),
- 10 kOhms non symmetric (- grounded).

#### Ac Power connection

- Powercon 25 A blue in and white link (max 12,6 A link)

#### Ac Power specifications

- 180 - 265 V AC 50 Hz / 2200 VA  
iMinerva 110 V AC 60 Hz / 300 VA

#### Mechanical specifications

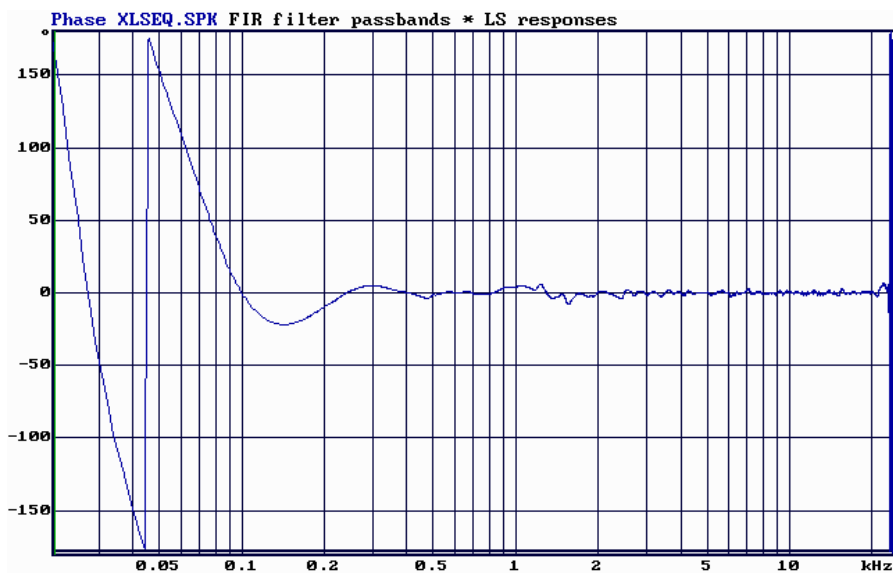
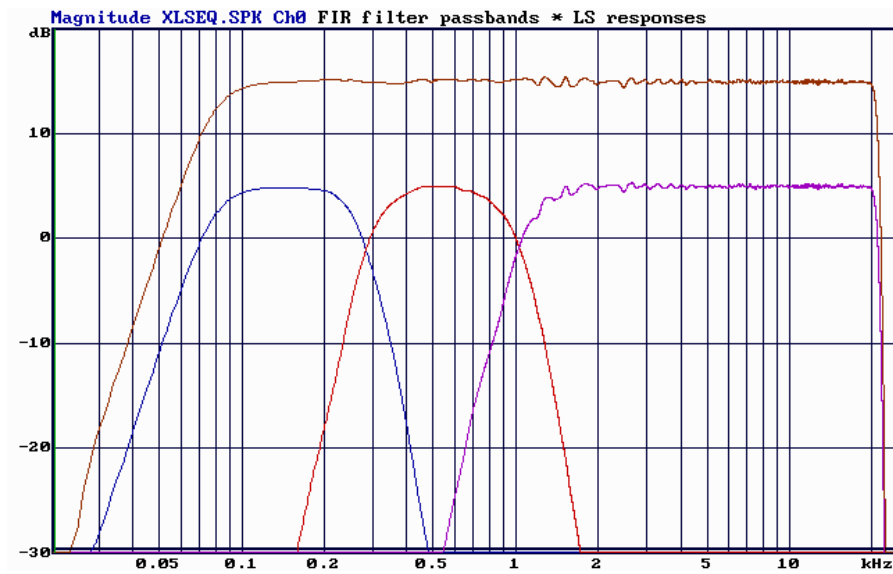
- Mounting: **four 8 mm inserts**
- Working load: 12 x Speaker-weight
- Construction: **15 - 27 mm Plywood**  
steal grill with foam, powder coated,  
inside acoustic carpet,  
foam and glue damping.  
Internal amp module mounted on 7 mm  
(2 mm) for iMINERVA  
aluminum back plate with total passive fan  
free cooling.
- Flying frame: CSR-10

# MINERVA 10 inch FIR point source loudspeaker

Data



## Measurements



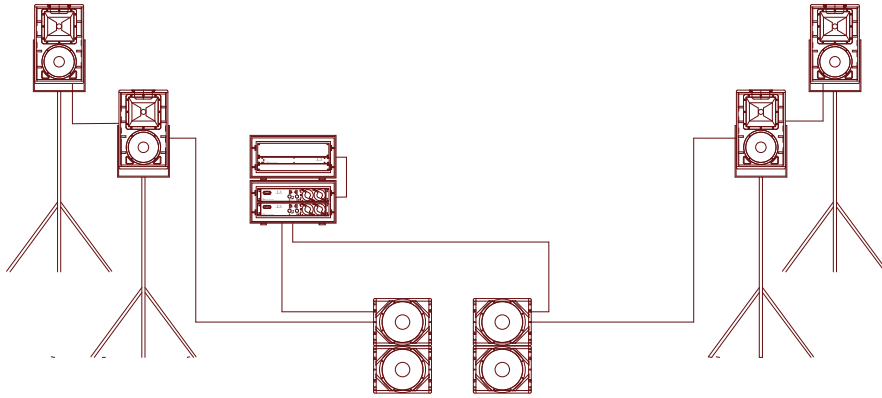
# MINERVA 10 inch FIR point source loudspeaker

## Systems



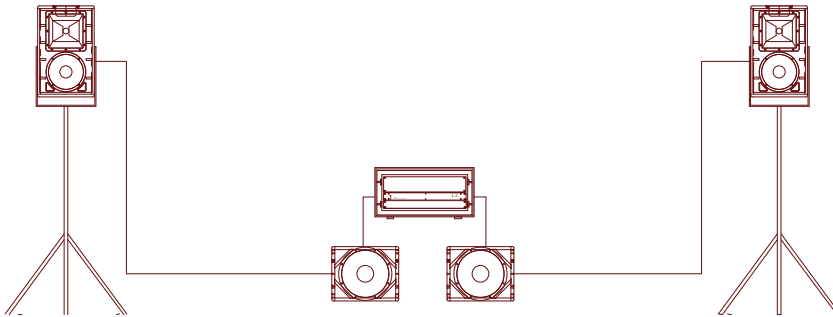
### System setups: MINERVA S1

System for Main or side, stage fill system use, with 4 x MINERVA-10P with 4 x TETHRA subwoofer, 2 x PAX-P16 Amp + 1 x HEIMDALL D05 FIR Controller.



### System setups: MINERVA S2

Typical starter system using 2 x iMINERVA-10 active per side with 2 x TETHRA sub and 1 x HEIMDALL D05 controller.



# MINERVA 10 inch FIR point source loudspeaker

Save operating

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## Protecting your speaker

MINERVA speakers may be used in combination with Cadenbach Acoustics PAX Amplifiers and Cadenbach Acoustics HEIMDALL controller.

In general, audio signals must not be over driven. This may be caused by mixing consoles, equalizers, effect equipment, etc. and should be indicated on this equipment. When a power amplifier is over-loaded at the output (clipping), then the amplifier activates a clipping warning signal. In any case, the signal must be reduced as soon as it sounds unnaturally distorted.

Damage caused by overloading the speakers or using the speakers without Cadenbach Acoustics PAX and HEIMDALL we do not assume warranty and excludes liability for possible consequential damage.

Permanent high-level signals with high frequency and continuous noise from feedback or permanently distorted high-level signals or noises, which occur when the amplifier is on while equipment is being connected, disconnected or switched on could damage the loudspeakers.

Do not install loudspeakers at places where they are permanently exposed to direct sunlight, high moisture, direct rain or strong vibrations and dust.



# MINERVA 10 inch FIR point source loudspeaker

## Manufacturer's Declarations



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### EU conformity of loudspeakers (CE symbol)

#### This declaration applies to:

Cadenbach Acoustics loudspeaker, MINERVA-10  
Cadenbach Acoustics loudspeaker, MINERVA-10P  
Cadenbach Acoustics loudspeaker, iMINERVA-10  
Cadenbach Acoustics loudspeaker, MINERVA9-10  
Cadenbach Acoustics loudspeaker, MINERVA9-10P  
Cadenbach Acoustics loudspeaker, iMINERVA9-10

All production versions of these types are included, provided they correspond to the original technical version and have not been subject to any later design or electro-mechanical modifications.

We herewith declare that said products are in conformity with the provisions of the respective EC directives including all applicable amendments.

A detailed declaration is available on request and can be ordered from Cadenbach Acoustics.

### WEEE Declaration (Disposal)

Electrical and electronic equipment must be disposed of separately from normal waste at the end of its operational lifetime.

Please dispose of this product according to the respective national regulations or contractual agreements. If there are any further questions concerning the disposal of this product, please contact Cadenbach Acoustics.

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Germany