



MKH 416 | MKH 418-S

PDF export of the original HTML instructions



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1. Preface

PDF export of the original HTML instructions

This PDF document is an automated export of an interactive set of HTML instructions. It may be the case that not all contents and interactive elements are contained in the PDF as they cannot be presented in this format. Furthermore, automatically generated page breaks may cause coherent contents to be moved slightly. We can therefore only guarantee the completeness of the information in the HTML instructions, and recommend that you use these. You can find this in the documentation portal at www.sennheiser.com/documentation.



2. Product information

All information about the product and available accessories at a glance.

MKH 416

Short shotgun interference tube mic for film, radio, and television, especially for outside applications.



Art. no. 001511

Delivery includes

- Microphone MKH 416-P48U3
- Foam windshield MZW 415
- Microphone clamp MZQ 100
- Camera adapter MZR 8000
- Instruction manual
- Supplement Sheet
- Pouch

Brief description

The MKH 416 is a directional studio microphone which is also especially suited to outdoor applications. Its high degree of directivity makes the MKH 416 a superb microphone for film and television, including outside broadcast applications. The microphone operates on the proven RF principle and is designed for 48 V phantom powering.

The MKH 416 is a combination of a pressure gradient transducer and an interference tube microphone. It has a super-cardioid pick-up pattern at low and medium frequencies, whereas at higher frequencies there is a transition to a lobar characteristic. Due to its operating principle, the MKH 416 is relatively insensitive to wind and pop noise and can therefore often be used as a soloist and broadcast microphone, without the need for an additional wind- or popshield. However, for outdoor recordings the use of an additional windshield is recommended.



The frequency response intentionally has a slightly rising characteristic at high frequencies. The microphone has a low proximity effect and therefore provides a well balanced sound even when used close to the sound source.

Features

- Increased directivity due to interference tube principle
- Very low inherent self-noise
- High sensitivity
- Transformerless and fully floating balanced output
- Rugged, suitable for adverse climatic conditions
- Matt black all-metal body

i You can find more detailed information about the MKH 416 in the following sections:

- Instruction manual [MKH 416](#)
- Specifications [MKH 416](#)



MKH 418-S

MS-Stereo-Rohrrichtmikrofon für den universellen Einsatz bei Film, Funk, TV sowie bei Reportagen im Innen- und Außenbereich.



Art. no. 005284

Delivery includes

- Microphone MKH 418-S
- Instruction manual
- Pouch

Brief description

The MKH 418-S is an MS stereo microphone. Its high degree of directivity makes the MKH 418-S the ideal choice for stereophonic recordings for reporting, film and television applications. The microphone is designed for 48 V phantom powering and operates using the RF principle. This principle ensures high operational reliability, even under extreme climatic conditions.

The MKH 418-S has two independent acoustic systems for generating the mid and side signals. The mid signal (M) is generated by a shotgun microphone system. At high frequencies, this results in a lobar pick-up pattern, whereas at low frequencies there is a transition to a super-cardioid characteristic. The side signal (S) is produced by a figure-of-eight capsule, whose positive side is directed to the left. The M and S signals are available independently at the microphone output. The microphone is positioned correctly when the word „TOP” is pointing upwards.

i You can find more detailed information about the MKH 418-S in the following sections:

- Instruction manual [MKH 418-S](#)
- Specifications [MKH 418-S](#)



Accessories

Various accessory parts are available for the microphones.

Microphone clamp

MZQ 100 | Art. no. 002155



Suspension

MZS 20-1 | with pistol grip | Art. no. 003609



Windshield

MZW 60-1 | Windshield with excellent suppression of wind noise when used for outdoor applications | Art. no. 003607





i Use only in combination with [Suspension](#).

MZH 60-1 | Hairy cover use in combination with windshield MZW 60-1 to provide maximum protection against wind noise | Art. no. 003224



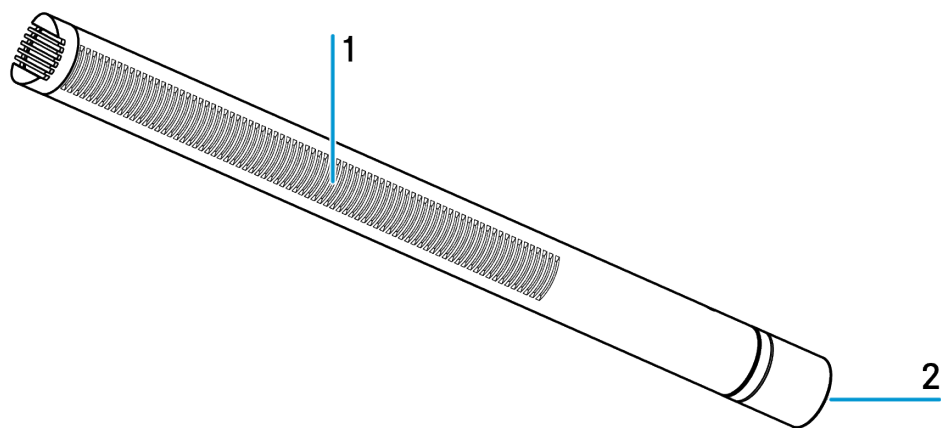


3. User manual

Starting up and operating the microphone MKH 416 and MKH 418-S.

MKH 416

Product overview



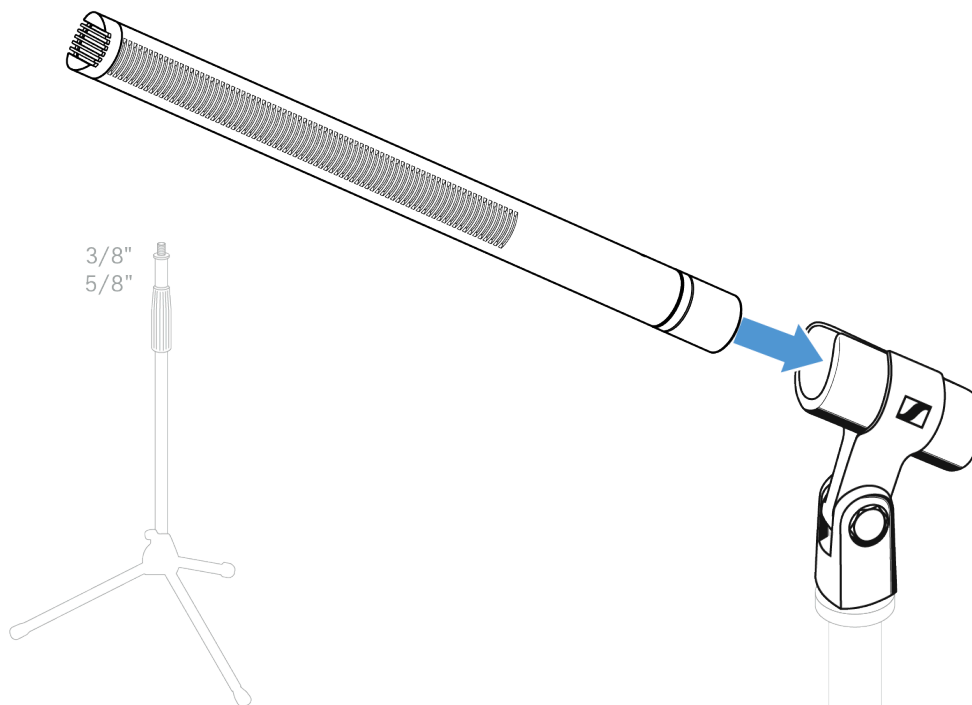
- 1 Sound inlet basket
- 2 XLR-3 socket



Starting up

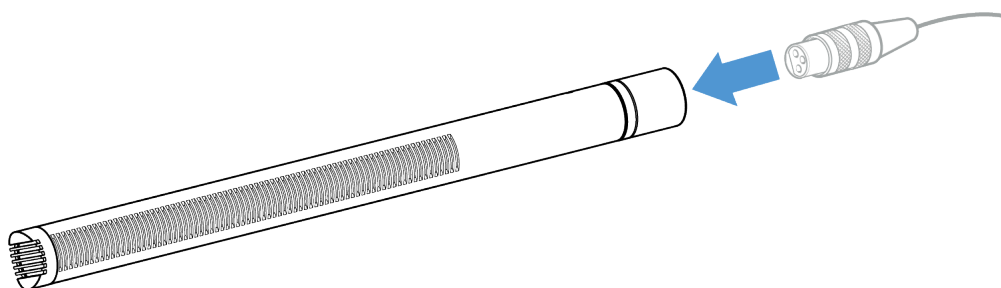
To mount the microphone to a stand:

- ▶ Screw the microphone clamp MZW 100 to a stand (optional accessory).
- ▶ Place the microphone into the clamp.



To connect the microphone:

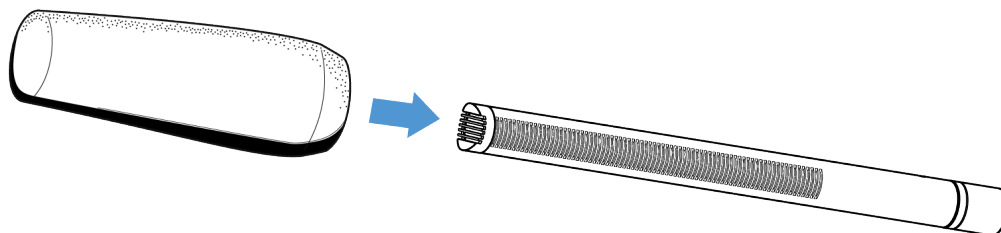
- ▶ Connect the XLR-3 socket of the microphone cable (optional accessories) to the XLR-3 socket of the microphone.





To use a windshield:

- ▶ Place the windshield MZW 415 over the microphone.





Operation

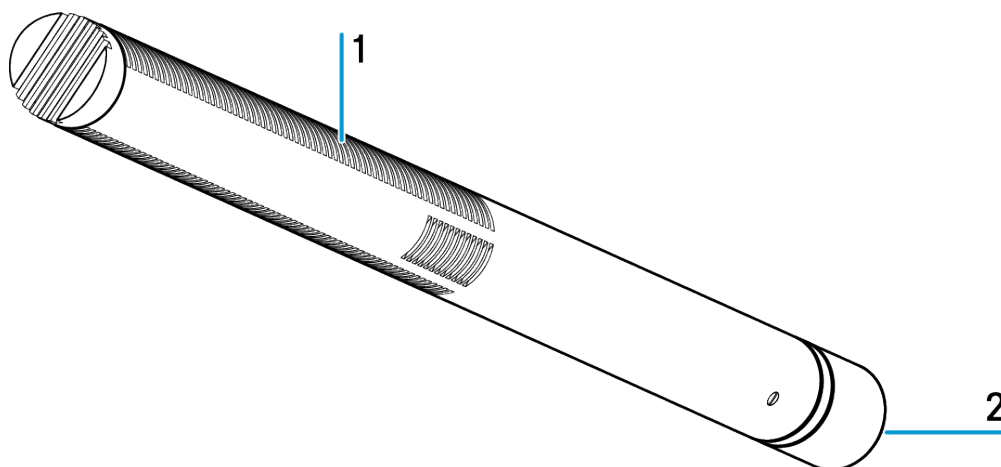
Principle of the RF circuit

In contrast to the high impedance of the capsules in conventional “DC biased” condenser microphones, the capsule of an RF condenser microphone has a low impedance. The high polarization voltages normally required in condenser microphones are not necessary in the RF condenser microphone. RF condenser microphones use a comparatively low RF bias voltage of less than 10 V, generated by a built-in low-noise oscillator (8 MHz). The RF principle ensures increased operational reliability, particularly for outdoor recordings under extreme climatic conditions.



MKH 418-S

Product overview



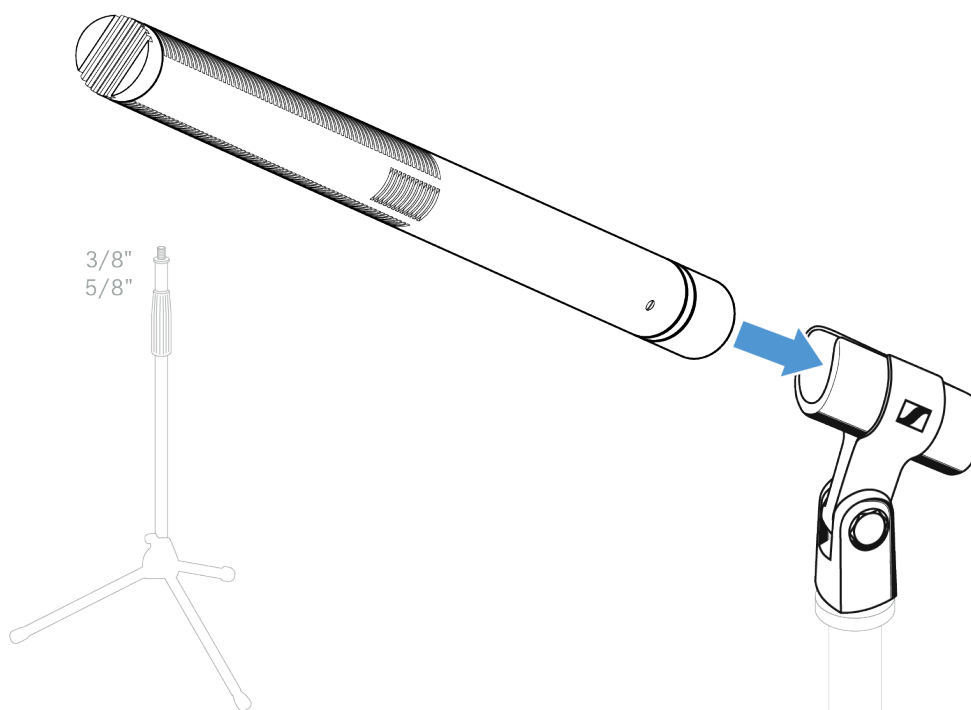
- 1 Sound inlet basket
- 2 XLR-5 socket



Starting up

To mount the microphone to a stand:

- ▶ Screw the microphone clamp MZW 100 to a stand (optional accessory).
- ▶ Place the microphone into the clamp.



To mount the microphone on a holder:

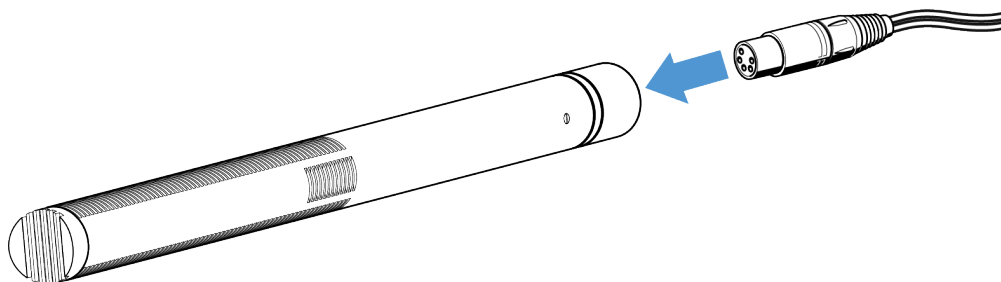
- ▶ To mechanically suppress the transmission of structure-borne noise, use the optionally available MZS 20-1 shock mount.



To connect the microphone:

- i** The MKH 418-S is designed for 48 V phantom powering. To ensure proper operation of the microphone, the two channels always have to be powered simultaneously, even if only the signal of one channel is required. If no 48 V phantom powering is available at the microphone input of the subsequent device, suitable power supply units must be interconnected.

- ▶ Connect the XLR-5 socket of a microphone cable (optional accessory) to the XLR-5 socket of the microphone.



The connector of the MKH 418-S has standard pin assignment:

- Pin 1 = Casing/ground
- Pin 2 = M channel (+)
- Pin 3 = M channel (-)
- Pin 4 = S channel (+)
- Pin 5 = S channel (-)

To use a windshield:

- ▶ Place the windshield MZW 60-1 (optional accessory) over the microphone.
- ▶ Place the hairy cover MZH 60-1 (optional accessory) over the MZW 60-1.

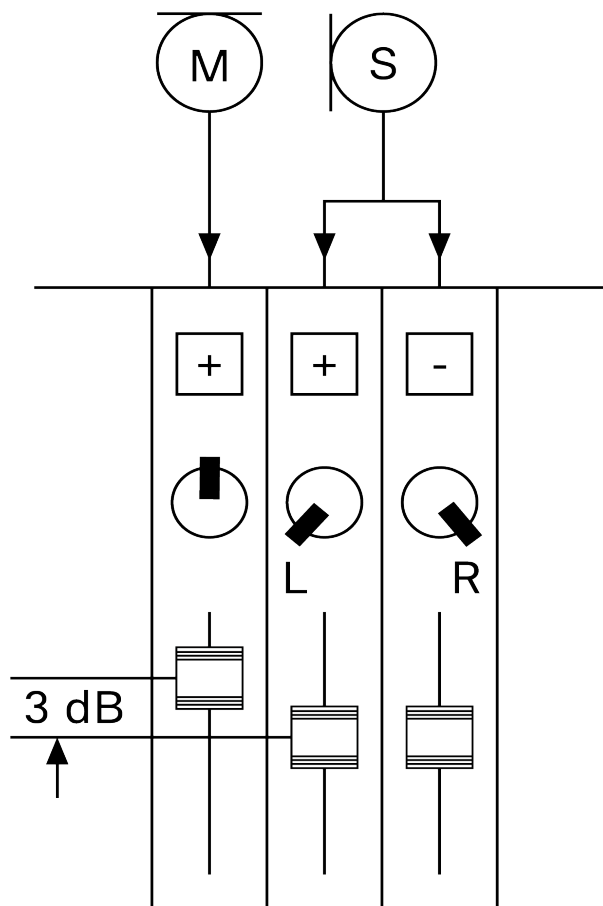


Operation

Notes on MS Stereo Sound Recording

The MS signal format of the MKH 418-S provides a particularly easy means of setting the optimum balance between the main information of the mid channel and the spatial contribution of the side channel. This balancing can even be performed during re-processing without a loss of information if the original MS signals were recorded. The MS signal format is converted into the XY format (ie: standard left/right stereo) by adding or subtracting the signals according to the principle $X = M + S$, $Y = M - S$. The proportion of the S signal influences the spatial effect and should be chosen in each case in accordance with the recording situation. In order to avoid restricting the possibilities of designing the sound impression, MS – XY matrixing in the microphone was not employed.

If a matrix circuit is not available on the mixing console, matrixing can be performed using the 3-fader method.



The M signal is connected to the first microphone channel and panned centre. The S signal is connected to the second channel and panned full left. Take an output from the second channel and connect to the third channel panned full right and phase reversed (via a phase reverse switch or via the cable). (To set the correct S signal level - set the pan controls of channel two to central, set the main fader to normal level and set the correct level at the preset. Then, set the pan control of channel 3 to centre, set the main fader to the same level



as channel two and then adjust the pre-set of channel three until the signal totally disappears – the two channels are now set identical – now pan channel two fully left and channel three fully right for normal operation). Channels two and three are controlled as a single fader (mechanically or electrically coupled together). The stereo width is controlled by the relative levels – less side is a narrower image, more side is a wider image. The displacement of the faders by 3 dB, as shown in the diagram as an example, results in 1:1 ratio matrixing.

During matrixing, it should be taken into account that the direction of off-axis sound signals can be determined less and less at high frequencies due to the increasing directivity of the shotgun microphone. This may lead to diffused spatial effects, which can be desirable or undesirable depending on the recording situation. In case of doubt, the proportion of the S signal should not be chosen too high. In some cases, it might be necessary to reduce the treble in the S channel on the mixing console. At low frequencies below 300 Hz, it is very difficult to locate sounds for physiological reasons. Since the S system of the microphone, due to its design principle, is more sensitive than the M system to low-frequency interference caused for example by wind, the bass in the S channel should be reduced if required (eg: with a high-pass filter).



Cleaning and maintenance

Note the following information when cleaning and maintaining the microphones.

NOTICE



Liquids can damage the electronics of the product

Liquids entering the product housing can cause a short-circuit and damage the electronics.

- ▶ Keep all liquids away from the products.
- ▶ Do not use any solvents or cleansing agents.
- ▶ Disconnect the mains-operated products from the power supply system and remove rechargeable batteries and batteries (if present) before you begin cleaning.
- ▶ Clean all products only with a soft, dry cloth.



4. Specifications

All specifications at a glance.

MKH 416

Specifications

Frequency response

- 40 - 20,000 Hz

Transducer principle

- RF condenser microphone

Pick-up pattern

- super-cardioid/lobar

Sensitivity (free field, no load) (1 kHz)

- 25 mV/PA \pm 1 dB

Nominal impedance

- 25 Ω

Min. terminating impedance

- approx. 800 Ω

Equivalent noise level

- CCIR-weighted: approx. 24 dB
- A-weighted: approx. 13 dB

Max. sound pressure level

- 130 dB SPL

Power supply

- 48 V \pm 4 V phantom powering

Current consumption

- approx. 2 mA



Temperature range

- -10 °C to + 70 °C

Finish

- matt black

Connector

- 3-pol. XLR connector

Pin assignment

- 1: Ground, housing; supply (-)
- 2: NF (+); supply (+)
- 3: NF (-); supply (-)

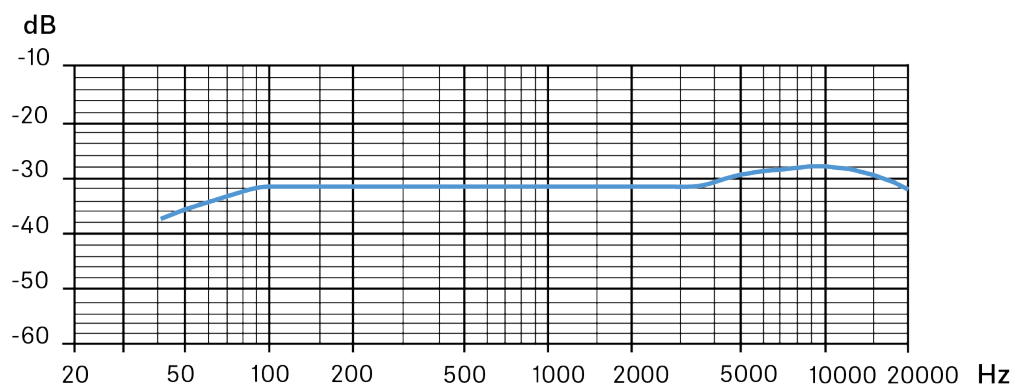
Dimensions

- Ø 19 x 250 mm

Weight

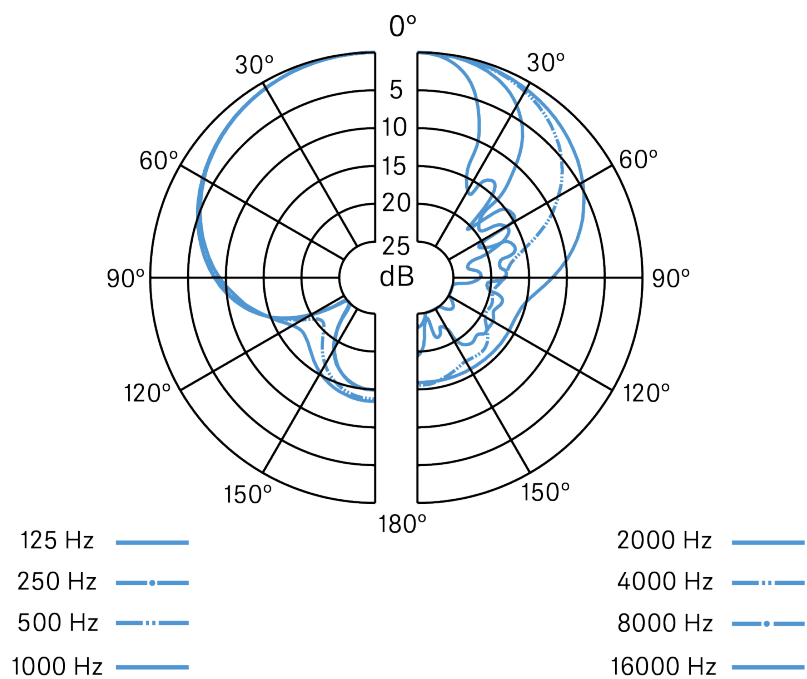
- 175 g

Frequency response





Polar pattern





MKH 418-S

Specifications

Frequency response

- 40 - 20,000 Hz

Transducer principle

- RF condenser microphone

Acoustic operating principle

- M: pressure gradient / interference tube receiver
- S: pressure gradient receiver

Pick-up pattern

- M: super-cardioid/lobar
- S: figure-of-eight

Sensitivity (1 kHz)

- M: 25 mV/Pa (-32 dBV)
- S: 10 mV/Pa (-40 dBV)

Output impedance (1 kHz)

- < 25 Ω

Min. load impedance

- 1 k Ω

Equivalent noise level

- M: 14 dB-A / 26 dB-CCIR
- S: 22 dB-A / 34 dB-CCIR

Max. sound pressure level

- 130 dB SPL (63 Pa)

Power supply

- P48: 48 \pm 4 V / 2 x 2.3 mA



Temperature range

- Operation: -20 to +60 °C

Output voltage

- max. 1.5 V

Connector

- 5-pin XLR, male

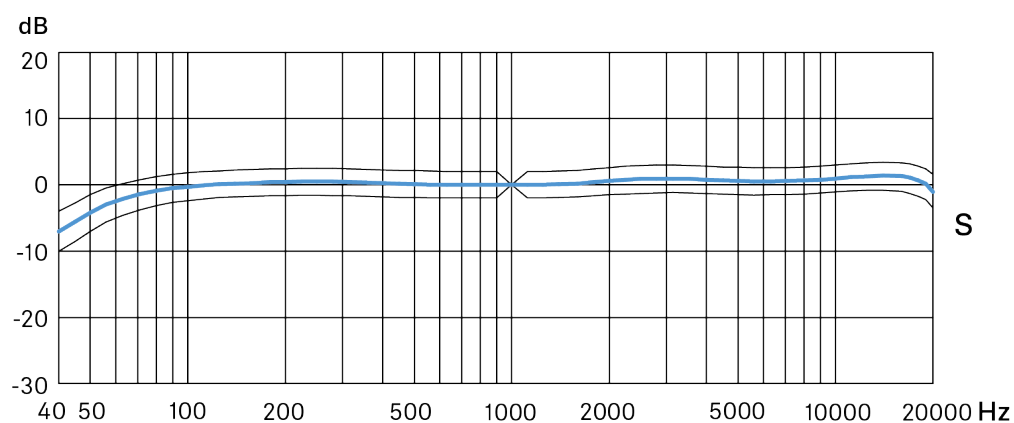
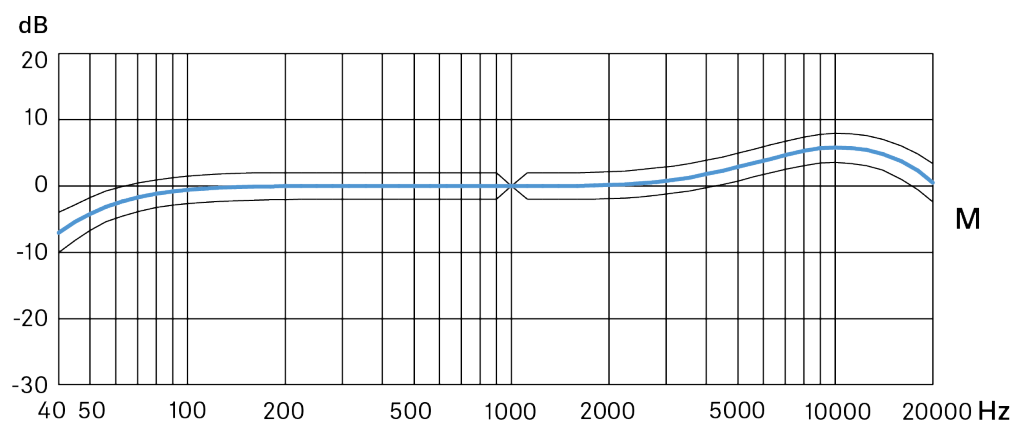
Dimensions

- Ø 19 mm x 280 mm

Weight

- 220 g

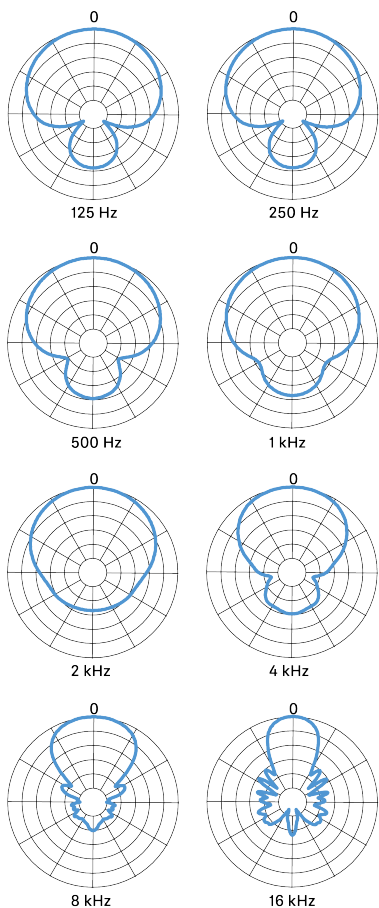
Frequency response



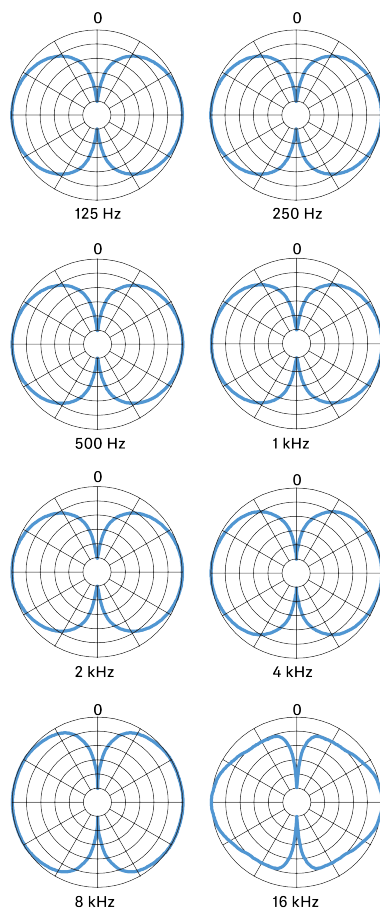


Polar pattern

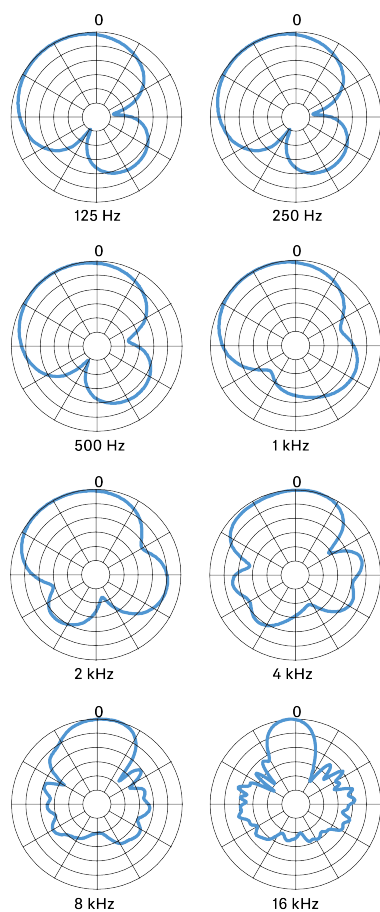
M (5 dB/div)



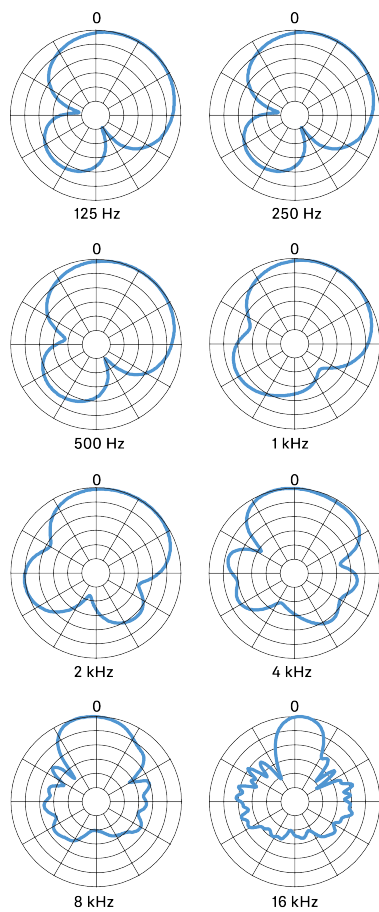
S (5 dB/div)



$$X = M + S (5 \text{ dB/div})$$



$Y = M - S$ (5 dB/div)





5. Regulatory information

Information on manufacturer declarations, environmental and disposal notices, and terms of use.

Model: MKH 416-P48U3, MKH 418-S

Warranty

Sennheiser electronic SE & Co. KG gives a warranty of 24 months on these products.

For the current warranty conditions, please visit our website at [sennheiser.com](https://www.sennheiser.com) or contact your Sennheiser partner.

In the US please contact:

Sennheiser Electronic Corporation

1 Enterprise Drive, Old Lyme, CT 06371

www.sennheiser.com

Warranty for Australia and New Zealand only

Sennheiser Australia Pty Ltd provides a warranty of 24 months on these products. For the current warranty conditions, visit Sennheiser website: Australia: [sennheiser.com](https://www.sennheiser.com), New Zealand: [sennheiser.com](https://www.sennheiser.com)

Sennheiser goods come with guarantees that cannot be excluded under Australian and New Zealand Consumer law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

This warranty is in addition to other rights or remedies under law. Nothing in this warranty excludes, limits or modifies any remedy available to be consumer which is granted by law.

To make a claim under this contract, raise a case via Sennheiser website. Australia: [sennheiser.com/support](https://www.sennheiser.com/support), New Zealand: [sennheiser.com/support](https://www.sennheiser.com/support)

All expenses of claiming the warranty will be borne by the person making the claim.

Sennheiser international warranty is provided by: Sennheiser Australia Pty Ltd (ABN 68 165 388 312) Level 14, Tower A Zenith Building, 821 Pacific Highway, Chatswood NSW 2067, Australia

Europe





In compliance with the following requirements

- Regulation (EU) 2023/988 on general product safety
- WEEE Directive (2012/19/EU)



Italy:

Raccolta carta

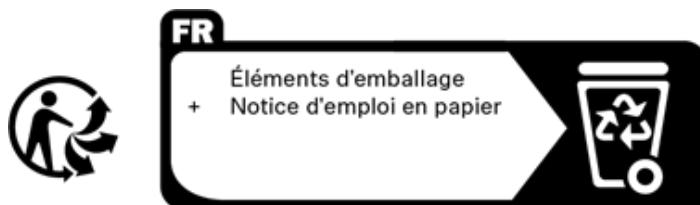


Raccolta plastica

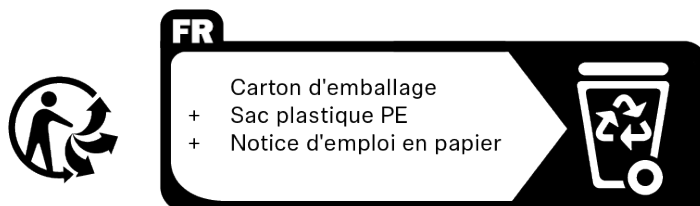


France:

MKH 416



MKH 418-S



Notes on disposal

The symbol of the crossed-out dumpster on the product, the (rechargeable) battery (if applicable) and/or the packaging indicates that these products must not be disposed of with normal household waste, but must be disposed of separately at the end of their service life. For the packaging, follow the regulations in your country for separating waste. Improper disposal of packaging materials can be harmful to your health and the environment.

The separate collection of waste electrical and electronic equipment, (rechargeable) batteries (if applicable) and packaging is intended to promote reuse and recycling and to prevent negative impacts on public health and the environment, for example due to hazardous substances contained in these products. At the end of their service life, recycle electrical and electronic equipment and (rechargeable) batteries so that their materials can be reused and to prevent environmental pollution.

If (rechargeable) batteries can be removed without destroying them, you are obliged to dispose of them separately (see the product's operating instructions for information on how to remove the batteries safely). Be especially careful when handling (rechargeable) batteries



containing lithium, as these pose special hazards, such as the risk of fire and/or health risks if button cells are swallowed. Reduce battery waste as much as possible by using longer-life batteries or rechargeable batteries.

Further information on the recycling of these products can be obtained from your municipal administration, from the municipal collection points, or from your Sennheiser partner. You may also be able to return electrical or electronic equipment to your distributor, if they are legally required to do so. By disposing of your batteries properly, you are helping to protect public health and the environment.

EU Declaration of conformity

- RoHS Directive (2011/65/EU)
- EMC Directive (2014/30/EU)

The full text of the EU declaration of conformity is available at the following internet address: sennheiser.com/download.

United Kingdom



In compliance with the following requirements

- WEEE Regulations (2013)



UK Declaration of conformity

- RoHS Regulations (2012)
- EMC Regulations (2016)

Importer: Sennheiser UK Ltd.

Pacific House, Third Avenue, Globe Park, Marlow

Buckinghamshire SL7 1EY, United Kingdom

Vietnam

Kể từ ngày 1 tháng 12 năm 2012, các sản phẩm được sản xuất bởi Sennheiser tuân thủ Thông tư 30/2011/TT-BCT quy định về giới hạn cho phép đối với một số chất độc hại trong các sản phẩm điện và điện tử.



USA

MKH 416:



Canada

MKH 416: CAN ICES-003(B) / NMB-003(B)

Australia / New Zealand

MKH 416:



China

MKH 416:

China RoHS

部件名称 (Parts)	有害物质										产品环保年限 EFUP
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr6+)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)	邻苯二甲酸二 (2-乙基己)酯 (DEHP)	邻苯二甲 酸丁基酯 (BBP)	邻苯二甲 酸二丁酯 (DBP)	邻苯二甲 酸二异丁酯 (DIBP)	
金属部件 (Metal parts)	x	o	o	o	o	o	o	o	o	o	15
电路模块 (Circuit Modules)	x	o	o	o	o	o	o	o	o	o	15
电缆及电缆组件 (Cables & Cable Assemblies)	x	o	o	o	o	o	o	o	o	o	15
电路开关 - 如果包含 (Circuit Breakers - if available)	x	o	o	o	o	o	o	o	o	o	15
本表格依据 SJ/T 11364 的规定编制。 o: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。 x: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。											

