# SpeechLine Wired

PDF export of the original HTML instructions

# Contents

# 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 these in the download section of the website under www.sennheiser.com/download.

# 2. Product information

All information about the series at a glance.



## Sennheiser SpeechLine Wired – Word for word

The spoken word is and remains the most personal and powerful instrument of communication we know.

It allows us to voice opinions, thoughts and views as well as emotions. This is why it is so important that when using technical aids, such as microphones, none of the content is lost or misunderstood.

The best microphones are those that the speaker does not have to think about while speaking because they capture the voice easily and record words as clearly and precisely as they are spoken. Perhaps the best-known microphone, which combines ease of use with high speech intelligibility, is the characteristically designed Sennheiser ME 36, which can be seen in almost every television news broadcast.

The qualities of this classic can also be found in all the other microphones in Sennheiser's versatile SpeechLine Wired series.

Whether wireless or wired, digital or analog, this comprehensive series of user-friendly, easy-to-integrate and discreetly designed microphones offers a solution for every scenario.

In many applications, a speech microphone can help to increase speech intelligibility or even make it possible in the first place (e.g. for telephone conferences). The following chapters describe the most common use cases.

# Typical applications

## Conferences (voice lift)

The larger the room, the more helpful is an audio system which enhances speech intelligibility. In large conference rooms in particular, a speaker seated at one end is difficult to understand at the other end. Table or ceiling microphones can be used to record the speaker. The audio signal can then be distributed evenly throughout the room via wall or ceiling speakers. This application is also known as voice lift, as the speech is amplified in the room.

## Teleconferencing

If not all participants in a meeting are sitting in the same room, they must join via telephone or remote conference. Since a telephone alone cannot provide adequate voice transmission for all participants in the room, table or ceiling microphones should also be used in this case. These are connected to a teleconference unit such as the Sennheiser TeamConnect system. This processes the signals and establishes the connection to the remote participants.

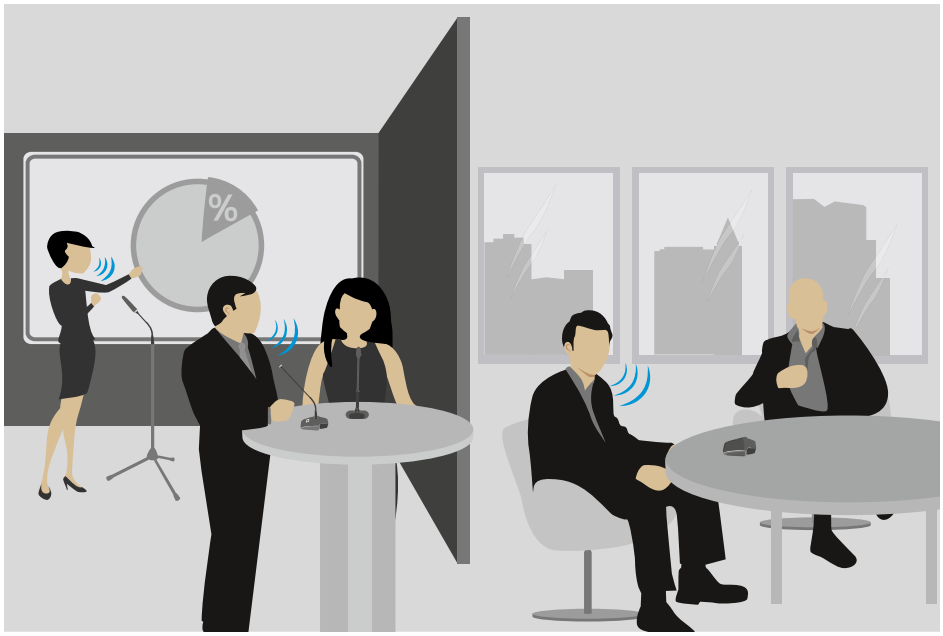
## Presentation

Particularly for presentations, where the focus is on conveying content, it is important that every word can be understood clearly. Again, the larger the room, the more important it is to amplify the voice. In this case, gooseneck microphones provide orientation for the speaker and support their presentation.

# Typical setup and installation types

## Examples

Mobile microphones:



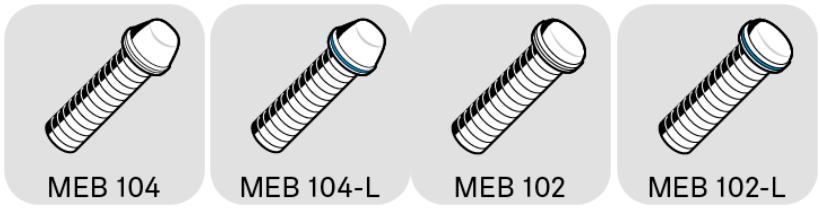
Built-in microphones:

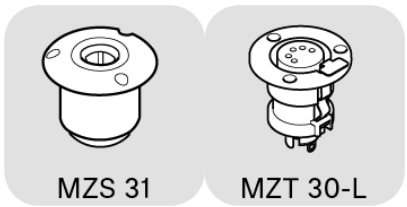
## Table

In meeting rooms in particular, it is useful to have a microphone on the table. All participants then sit around the table. Sennheiser offers both mobile solutions and built-in microphones. Simply place the mobile microphones on the table.

Mobile setup:

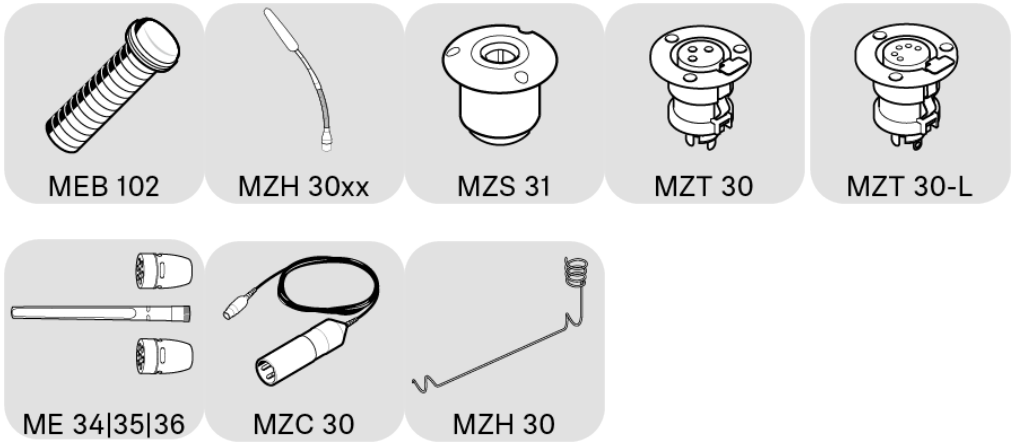

Fixed installation:



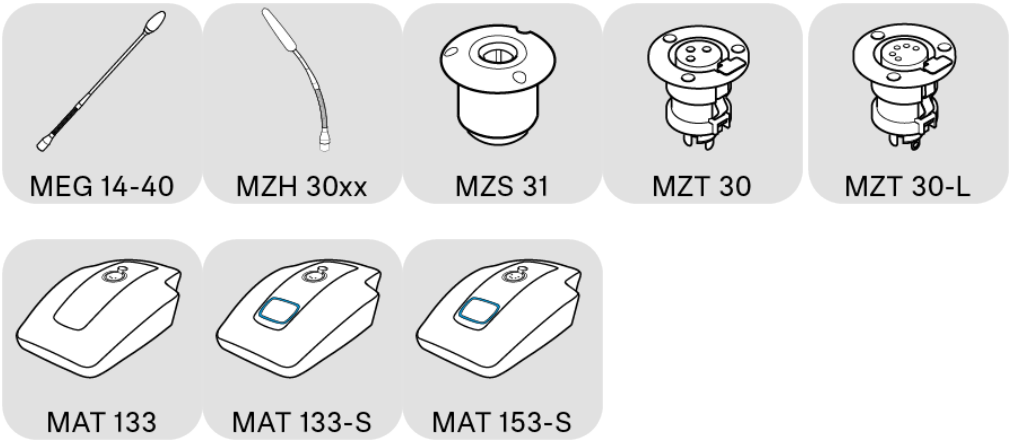
## Ceiling

An alternative is miking from the ceiling. The advantage of this approach is that the microphones can be installed in such a way that they are practically invisible in the room. Ceiling mounting requires precise planning as the microphones are further away from the speaker and the speech intelligibility may be impaired by fan noise from a projector or air conditioning system.




## Lectern

A lectern is usually used for presentations. Here too, microphones can be placed temporarily or permanently installed. A gooseneck microphone brings the microphone capsule close to the speaker thereby ensuing maximum speech intelligibility. Flexible goosenecks avoid conflicts with laptops as they can be flexibly aligned.

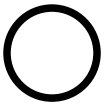



## Floor

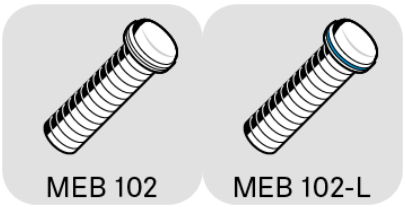
For spontaneous presentations or panel discussions, floor stands provide a solid base for a gooseneck microphone.

# Microphone pick-up patterns

### Omni-directional polar pattern

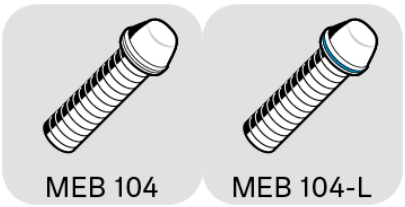


The omni-directional picks up sound information evenly in all directions.




### Cardioid polar pattern

The cardioid features broad directivity and a wide apex angle. Sound that hits the back of the microphone is attenuated the most.





### Supercardioid polar pattern

The supercardioid is slightly more directional than the cardioid, meaning it suppresses even more noise from the side, but also picks up some sound from behind.


### Supercardioid | lobar polar pattern

The supercardioid or lobar has the strongest directional effect, i.e. the greatest suppression of sound from the side, but also absorbs sound from behind. However, the ratio is lower here than with the supercardioid.

# Positioning of the microphone type

## Speaking distance

As a rule of thumb, the nearer a speaker is to the microphone, the higher the speech intelligibility. For this reason, gooseneck microphones are optimal from an acoustic point of view. They position the microphone capsule close to the speaker and at the same time provide excellent orientation.

While boundary microphones do not quite achieve the excellent acoustic properties of gooseneck microphones, they can be positioned extremely inconspicuously. Thanks to their small size and appropriate colors, these microphones can be integrated into any room. Due to the so-called boundary effect, the signal picked up by the microphone capsule is amplified on the surface (e.g table or ceiling panel). This compensates for some of the distance to the speaker.

## One microphone for each speaker

Ideally, each speaker will use a dedicated microphone. This ensures the best possible alignment and distance to the speaker at all times. The directivity can also be made narrower to minimize lateral noise and acoustic reflections. This ensures the highest speech intelligibility.

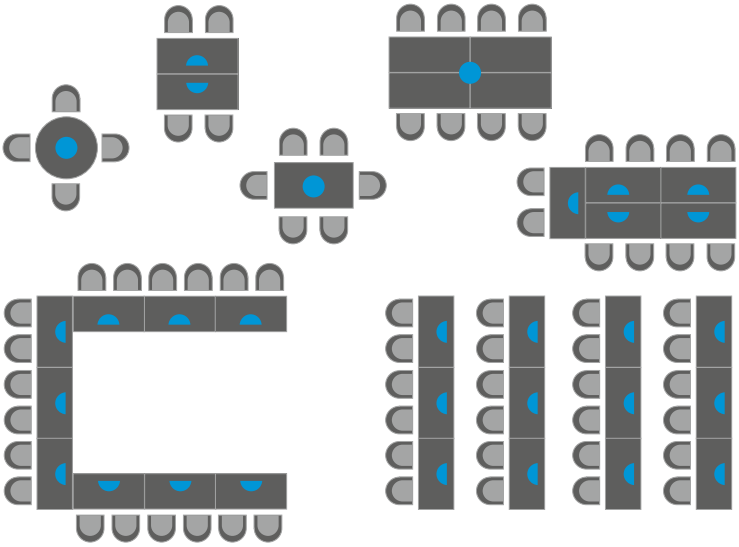
## “Shared mics” – several speakers share a microphone

One microphone per speaker is ideal, but for many applications one microphone for two people is sufficient. In this case, you should select a microphone with a wide enough apex angle for the recording. This allows the microphone to pick up both speakers when installed centrally in front of them.

## Typical table shapes – U, round, long tables, rows

Different microphones can be selected depending on the arrangement of the tables in a room. With a small, round table, for example, an omni-directional microphone (shown as a blue circle) is sufficient to pick up all meeting participants evenly. For rows of tables, directional microphones (shown as a semicircle) are more suitable, as they minimize the

sound from the back and sides. In long meeting rooms with long tables, a combination of directional and omni-directional microphones can be a solution.



### Speaker in sitting position

For meetings in which speakers are seated, planning is straightforward, as the distance to the microphone can be easily estimated or measured. The microphone is simply placed on the table in the direction of the speaker.

### Speaker standing

In the case of presentations at a lectern, speakers are usually standing. Here the distance between the lectern and the speaker's mouth is similar to that when sitting. In courtrooms, speakers often stand, while the table in front of them is usually at "normal" height. In this case, long gooseneck microphones should ideally be used to ensure proximity to the speaker.

# Typical acoustics

## Normally damped room

A normally damped room has an average attenuation of reflections. Carpets, curtains or special acoustic ceilings make a positive contribution to this. When acoustic reflections in the room are reduced, microphones pick up less “noise” and speech intelligibility is at its highest.

## Room with sound system

If speech is amplified by loudspeakers in the room, this signal can also get back to the microphone as an echo or, in the worst case, acoustic feedback. This effect can be reduced by using more directional microphones.

## Large/reverberant room – Acoustically challenging rooms

The larger the room, the more likely it is for acoustic interference to occur due to reflections or sound from loudspeakers. If there are also lots of smooth surfaces, such as glass fronts or smooth floors, this represents a very unfavorable acoustic scenario. In this case, only highly directional microphones such as the ME 36 can ensure speech intelligibility.

# Overview of the SpeechLine Wired series

The SpeechLine Wired series provides microphones for different room and speaking positions (standing, sitting).

Depending on the application, the microphones can be permanently installed in tables or podiums, mounted on the ceiling or simply set up as needed.

The series comprises the following products:

## XLR-5 connection on the microphone

Boundary microphones with luminous ring:

- MEB 102-L
- MEB 104-L

Gooseneck microphones with luminous ring:

- MZH 30xx-L goosenecks: MZH 3015-L, MZH 3040-L, MZH 3042-L, MZH 3062-L, MZH 3072-L with microphone head ME 34, ME 35 or ME 36
- MEG 14-40-L, MEG 14-40-L-II gooseneck microphones

Table stands for gooseneck microphones:

- With microphone button: MAT 153-S

Table mount for gooseneck microphones:

- MZS 31
- MZT 30-L

Floor stand for gooseneck microphones:

- MZFS 60 or MZFS 80

## XLR-3 connection on the microphone

Boundary microphones:

- MEB 114 | with microphone button MEB 114-S
- MEB 102 | MEB 104

Gooseneck microphones:

- MZH 30xx goosenecks: MZH 3015, MZH 3040, MZH 3042, MZH 3062, MZH 3072 with microphone head ME 34, ME 35 or ME 36
- MEG 14-40 gooseneck microphone

MAS 133 switch box and MAS 1 button for controlling a microphone

Table stands for gooseneck microphones:

- MAT 133 | with microphone button: MAT 133-S

Table mount for gooseneck microphones:

- MZS 31
- MZT 30

# 3. User manual

Starting up and operating devices of the SpeechLine Wired line.

**Related information**
Product overview

**Starting up and operating devices of the SpeechLine Wired line**
Planning the position of the built-in products
Mounting boundary installation microphones, built-in buttons, switch box: table | lectern
Mounting gooseneck microphones: table| lectern | stand
Mounting microphones on the ceiling
Setting up mobile microphones

**Connecting products**
Connecting products to an audio input
Connecting products via the logic function

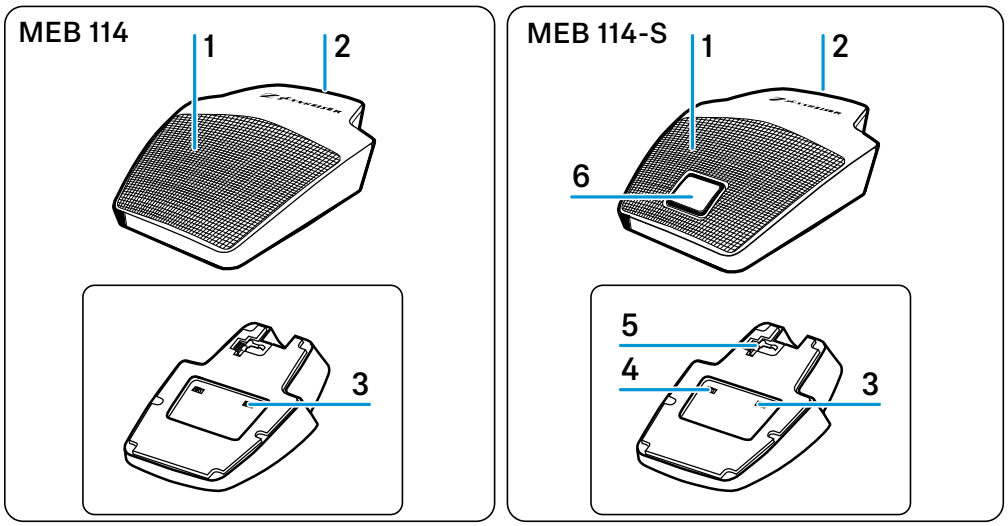
**Setting up and using products**
Leveling out microphones
Setting the switching behavior of the microphone
Muting/activating microphones

Cleaning and maintenance

## Product overview

MEB 114 (-S) boundary microphones
MEB 102 (-L) | MEB 104 (-L) boundary installation microphones
MEG 14-40 (-L(-II)) gooseneck microphones
MZH 30xx (-L) goosenecks
MAT 133 (-S) | MAT 153-S table stands
MAS 133 switch box
MAS 1 built-in button
MZFS 60 | MZFS 80 stands

## MEB 114 (-S) boundary microphones




**1** Microphone

**2** Mini-XLR 3 connection socket

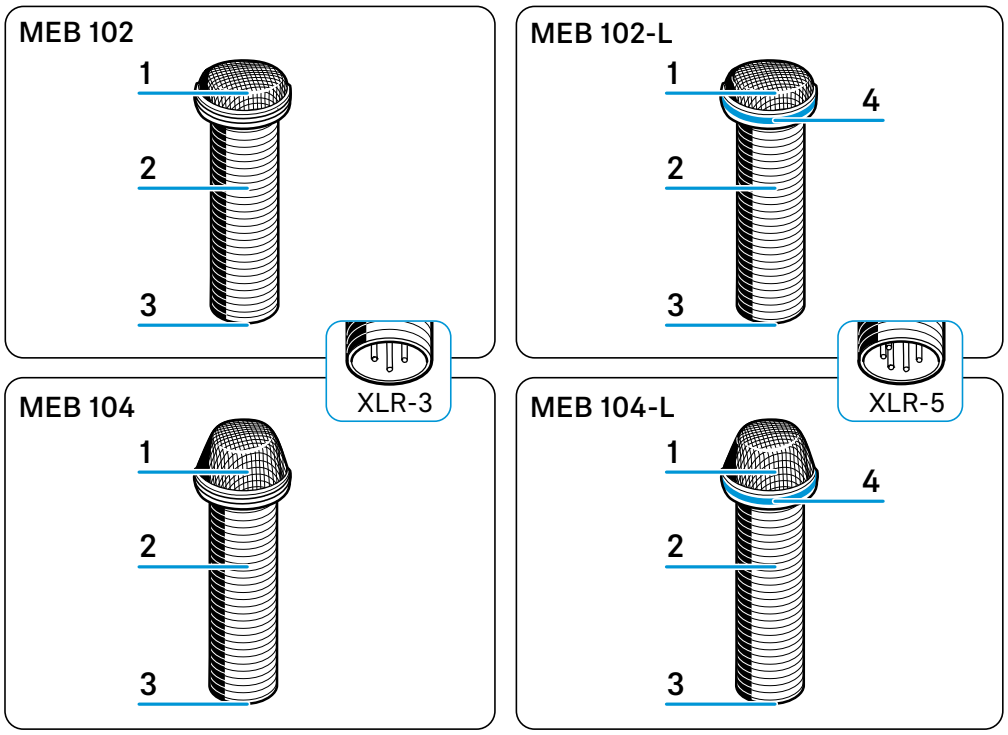
**3** “Low-cut” filter

**4** Slide switch for microphone button behavior

**5** Logic port

**6** Microphone button with luminous ring (red/green)

## MEB 102 (-L) | MEB 104 (-L) boundary installation microphones



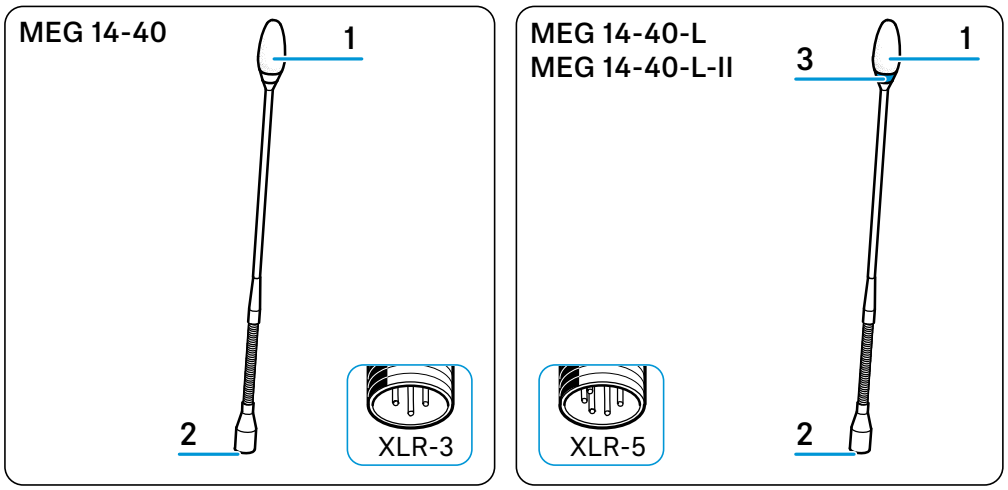

**1** Microphone head

**2** Fastening thread

**3** XLR connection socket

**4** Luminous ring (red/green)

## MEG 14-40 (-L(-II)) gooseneck microphones



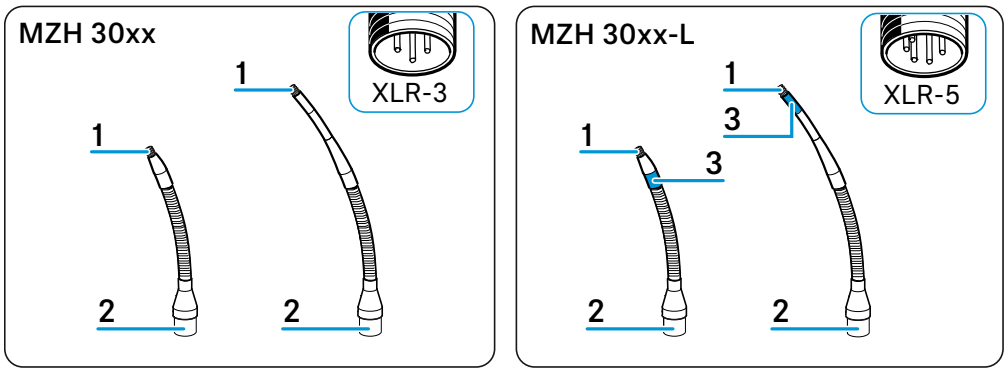

**1** Microphone head

**2** XLR connection socket

**3** Luminous ring

- Red: MEG 14-40-L
- Green: MEG 14-40-L-II

## MZH 30xx (-L) goosenecks

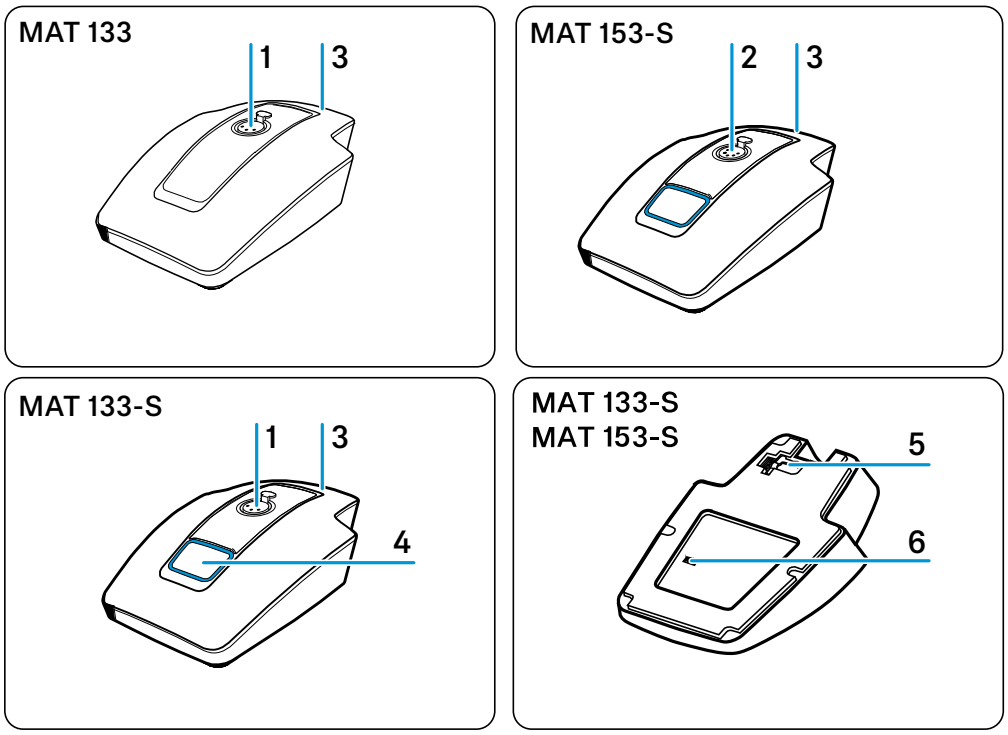



**1** Thread for microphone head ME 34/35/36

**2** XLR connection socket

**3** Luminous ring (red/green)

## MAT 133 (-S) | MAT 153-S table stands




**1** XLR-3 socket for gooseneck microphone

**2** XLR-5 socket for gooseneck microphone

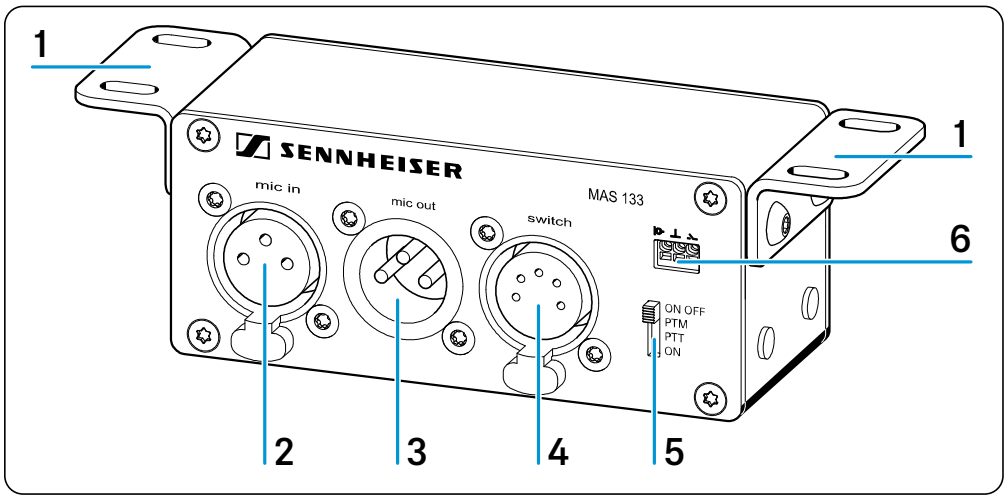
**3** XLR-3 connection socket

**4** Microphone button with luminous ring (red/green)

**5** Logic port

**6** Slide switch for microphone button behavior

## MAS 133 switch box




1 Angle brackets

2 Microphone input, XLR-3F mic in

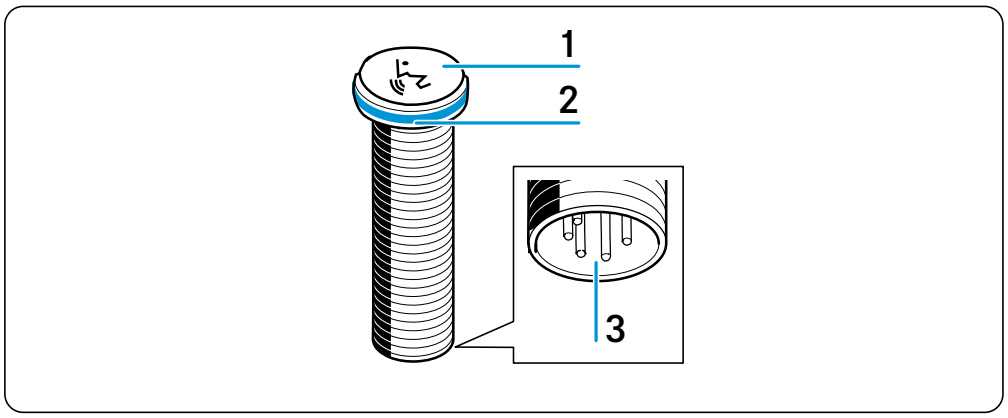
3 Microphone output, XLR-3M mic out

4 Built-in button connection, XLR-5F switch

5 Slide switch for microphone button behavior

6 Logic output, logic out

## MAS 1 built-in button

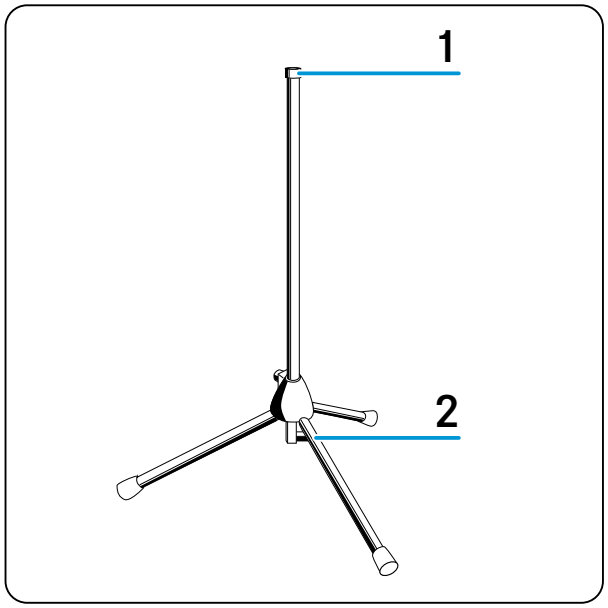



**1** Microphone button

**2** Luminous ring (red/green)

**3** Switch box connection, XLR-5M

## MZFS 60 | MZFS 80 stands



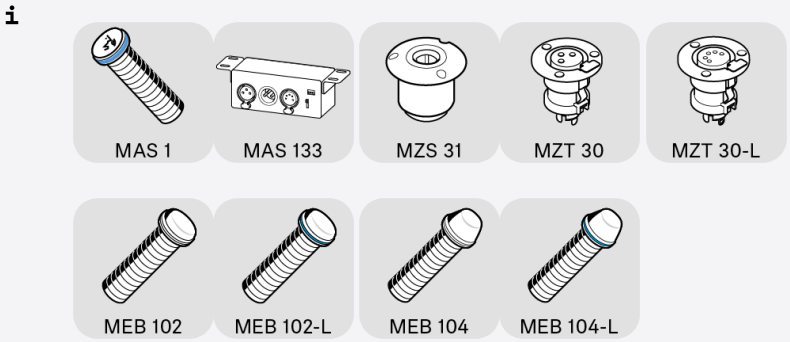

**1** Microphone connection, XLR-3F

**2** Connection socket, XLR-3M

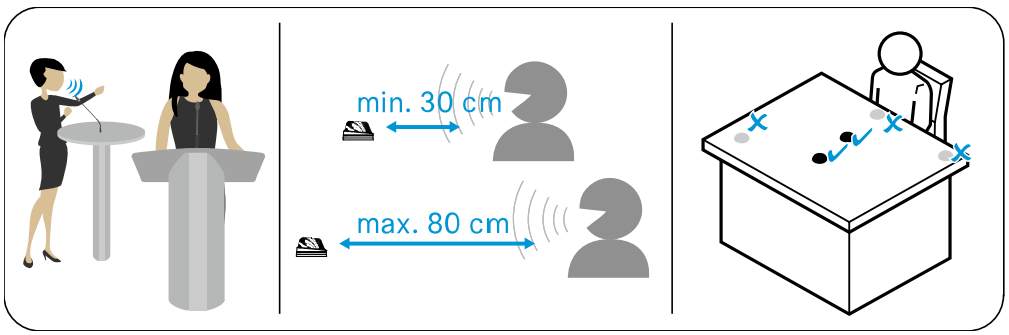
# Starting up and operating devices of the SpeechLine Wired line

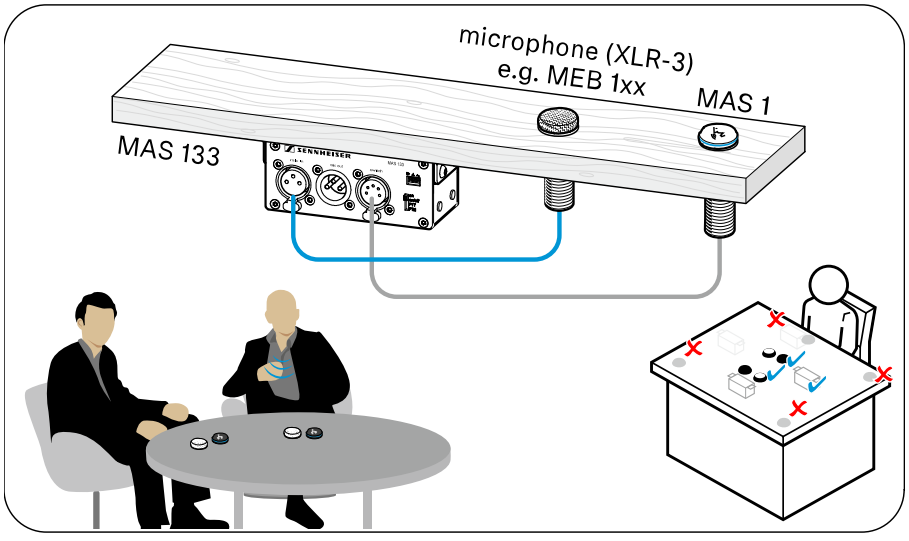
# Planning the position of the built-in products

**Planning the position for installation microphones| built-in buttons | switch boxes on tables and lecterns**

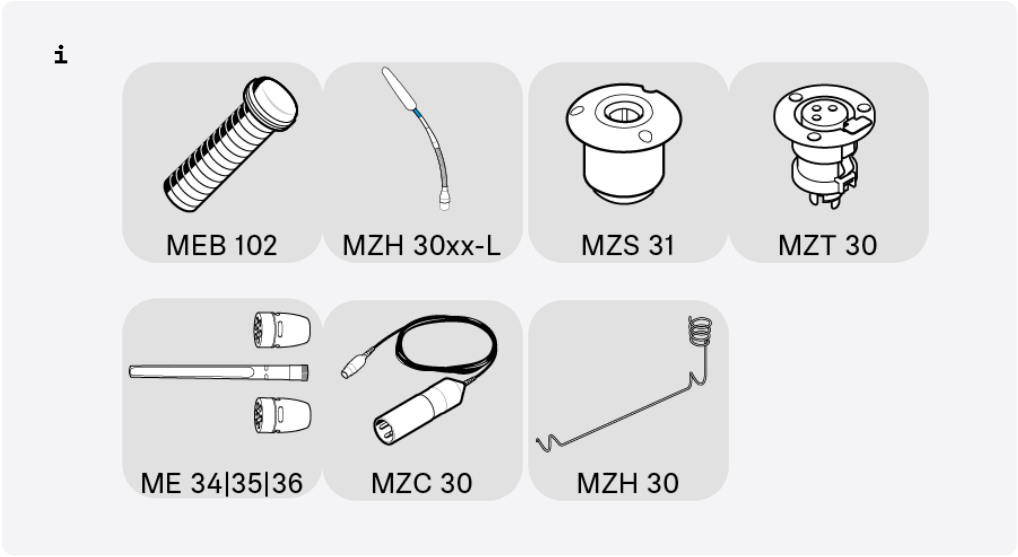



- Select the positions for microphones, built-in buttons, built-in sockets, shock mounts and switch boxes on e.g. lecterns or conference tables in such a way that
  - Speakers do not bang their knees when sitting down
  - The distance between the speaker and the microphone is 30 cm to 80 cm (10" to 30") (optimum speech quality)
  - The speaker can easily reach the microphone buttons and
  - There are no obstacles, source of interference – such as telephones or PC fans – or moving parts in the vicinity of the microphone.

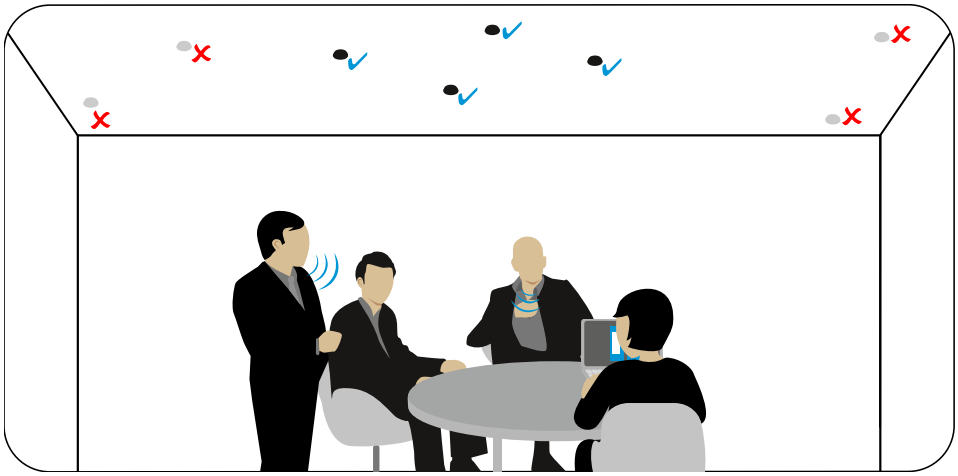


**Planning the position for microphones | microphone accessories on a ceiling**




- Select the position for the microphone and built-in socket in such a way that:
  - They hang directly above or near the speaker
  - Neither speakers nor other people can bump their heads on the microphone or get caught on the suspended cable.
- Observe the fire protection guidelines applicable to the building when mounting on the ceiling.

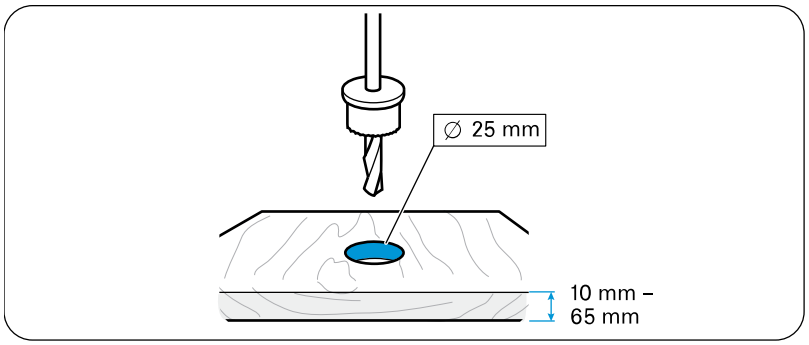


# Mounting boundary installation microphones, built-in buttons, switch box: table | lectern

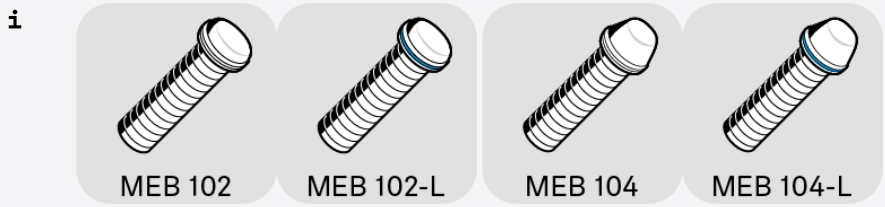
**Drilling a hole for boundary installation microphones | built-in buttons in the installation surface**


Once you have chosen a position for the product (see Planning the position of the built-in products):

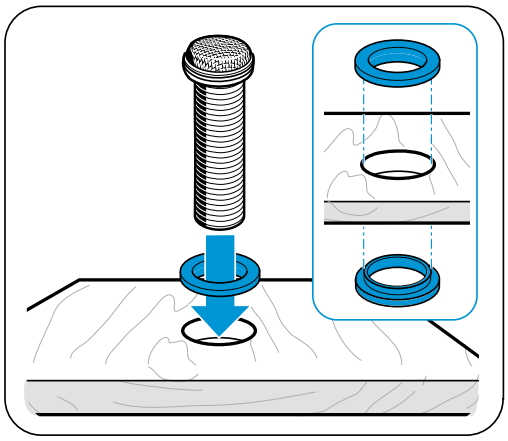
- Drill a hole with a diameter of 25 mm in the installation surface (e.g. table top, panel thickness 10 mm – 65 mm).



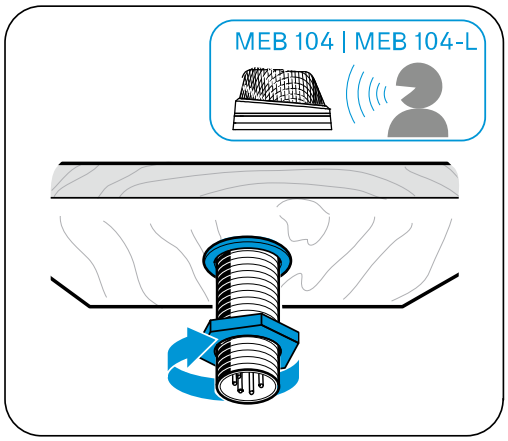
**Mounting the MEB 102 (-L) | MEB 104 (-L) boundary installation microphone**




- Slide the first rubber ring onto the thread of the microphone and insert both into the hole.

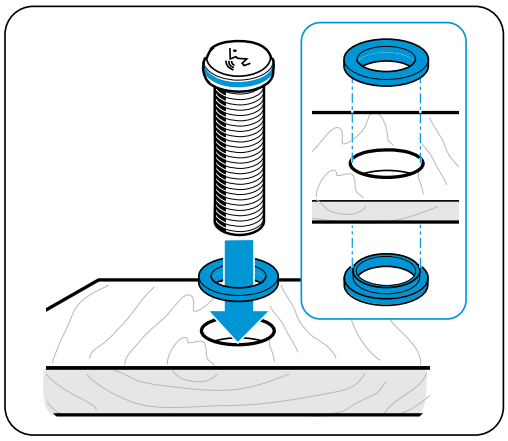


- Point the MEB 104 and MEB 104-L microphones toward the speaker. Slide the second rubber ring onto the thread and tighten the hex nut.

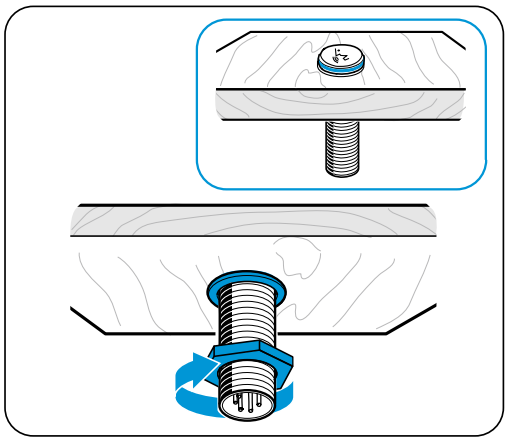


### Mounting the MAS 1 built-in button


- Slide the first rubber ring onto the thread of the built-in button and insert both into the hole.

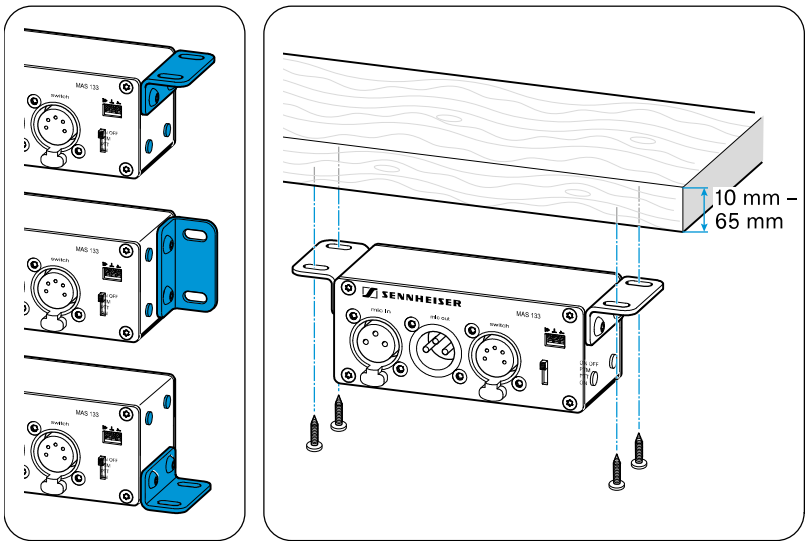


- Slide the second rubber ring onto the thread and tighten the hex nut.



### Mounting the MAS 133 switch box

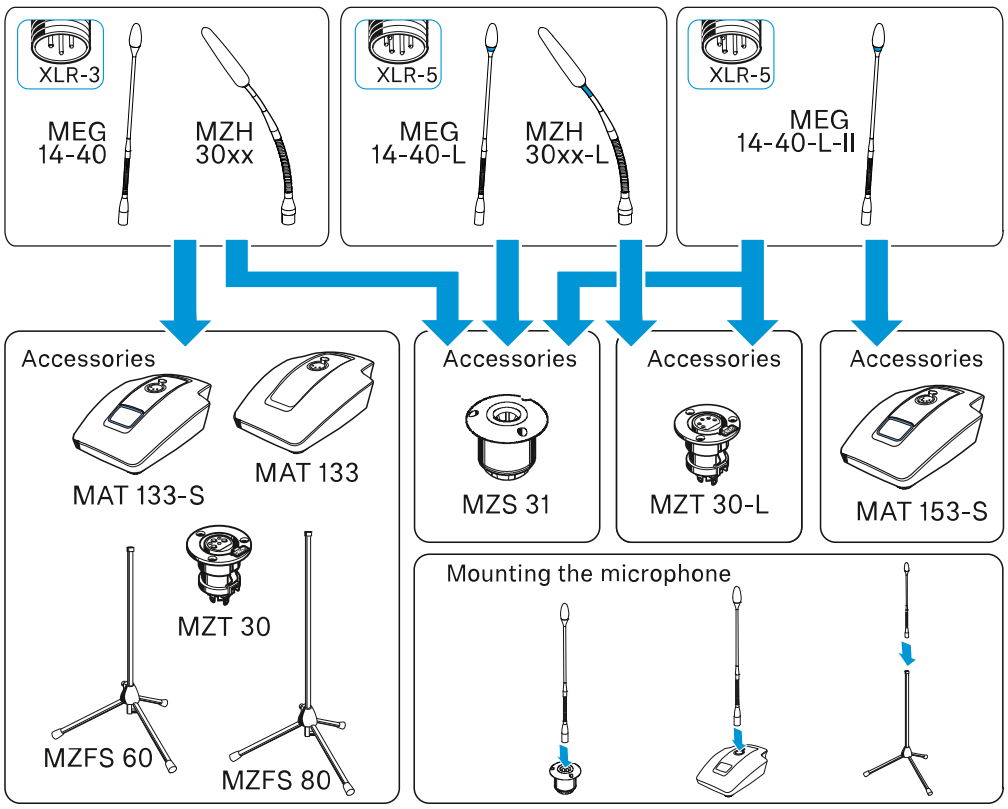

- If necessary, change the orientation of the mounting brackets by loosening the screws and removing the drill hole covers.
- Fix the mounting brackets in the desired position and refit the covers.
- Mark the position of the screws using the drilling template.
- Secure the switch box using the recessed head screws supplied.



## Mounting gooseneck microphones: table| lectern | stand

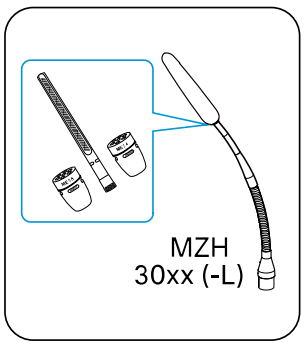
You can mount gooseneck microphones:

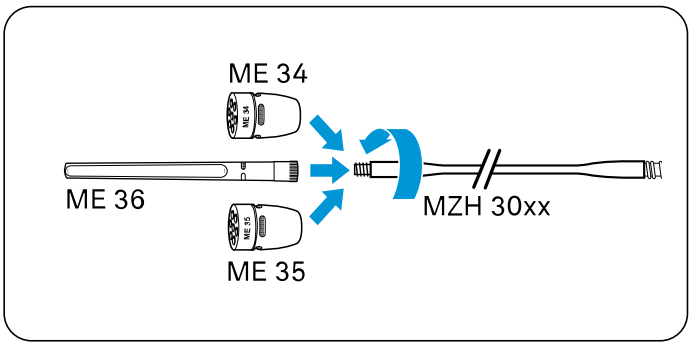
- On mobile table bases
- Stands
- Fixed installation sockets or shock mounts



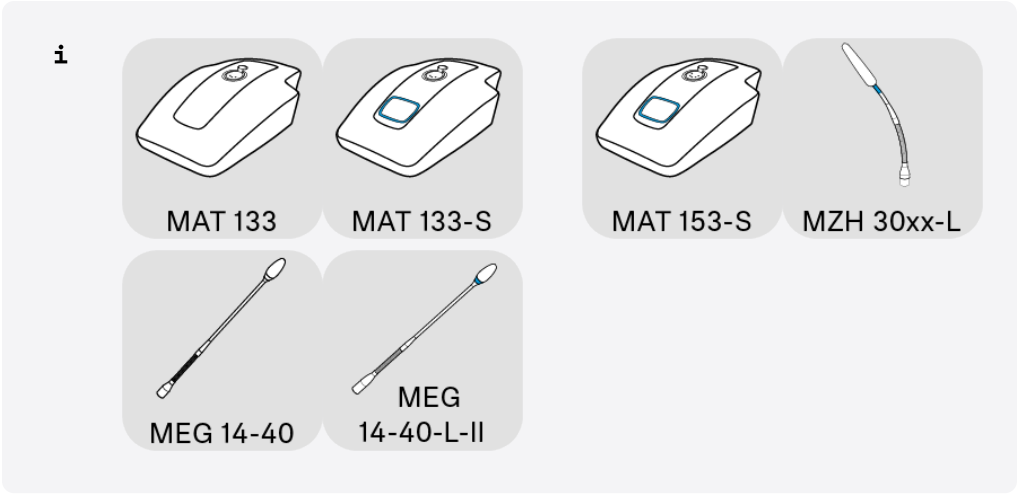
### Mounting ME 3x microphone head on MZH gooseneck


- Screw one of the microphone heads firmly onto the gooseneck to ensure a proper ground connection.

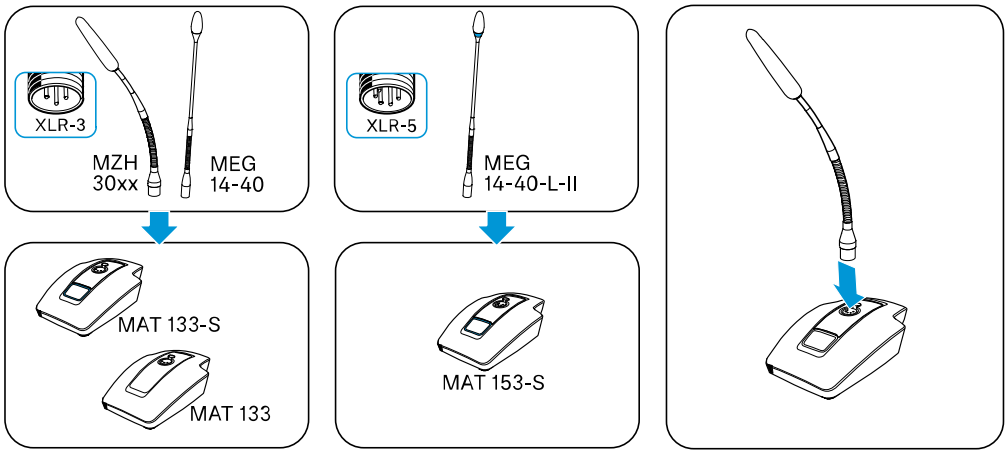


### A) Mounting MEG/MZH gooseneck microphone on MAT table stand

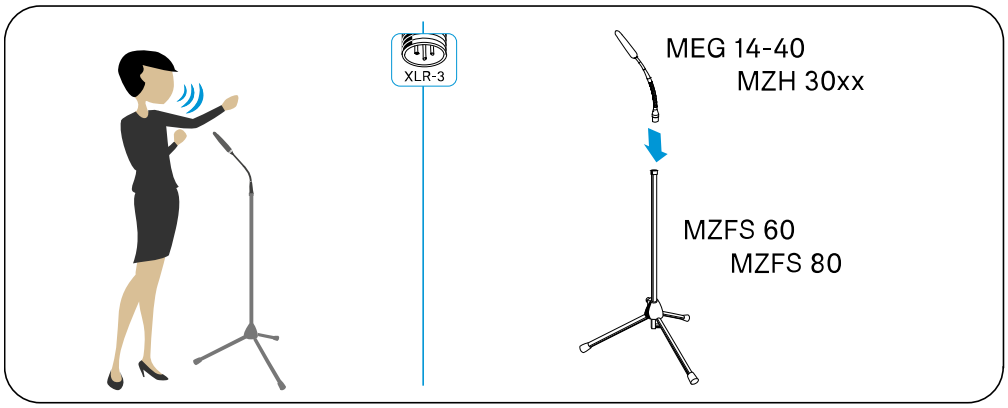



- Plug the XLR connector of the gooseneck microphone into a corresponding connector on the table stand.
- Point the microphone toward the speaker.

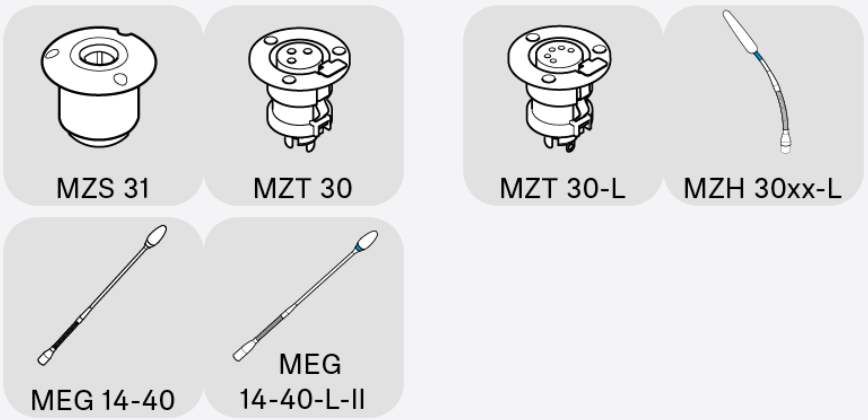


### B) Mounting MEG/MZH gooseneck microphone on MZFS stand


- Plug the XLR-3 connector of the gooseneck microphone into the corresponding connector on the stand.



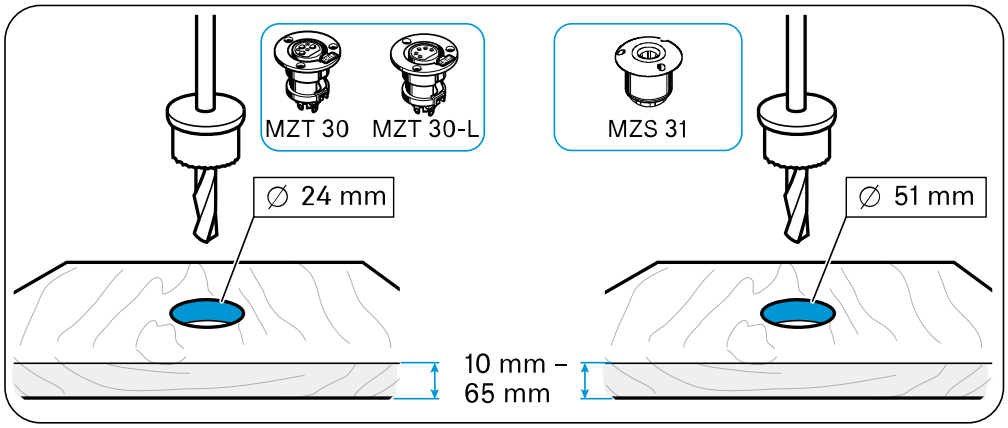
**C) Mounting MEG/MZH gooseneck microphone with MZT installation socket/MZS shock mount**



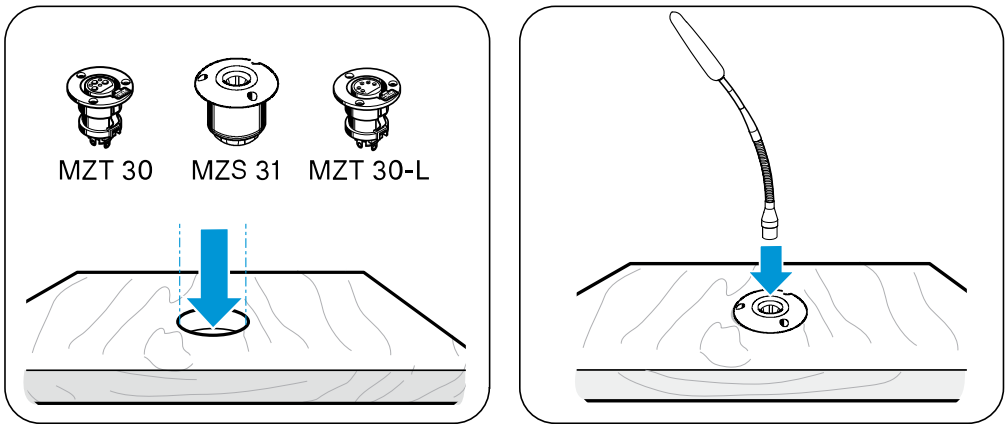

Once you have chosen a position for the product (see Planning the position of the built-in products):

- Drill a hole with a diameter of
  - MZT 30 (-L) table installation socket: 24 mm **OR**
  - MZS 31 shock mount table mount: 51 mm

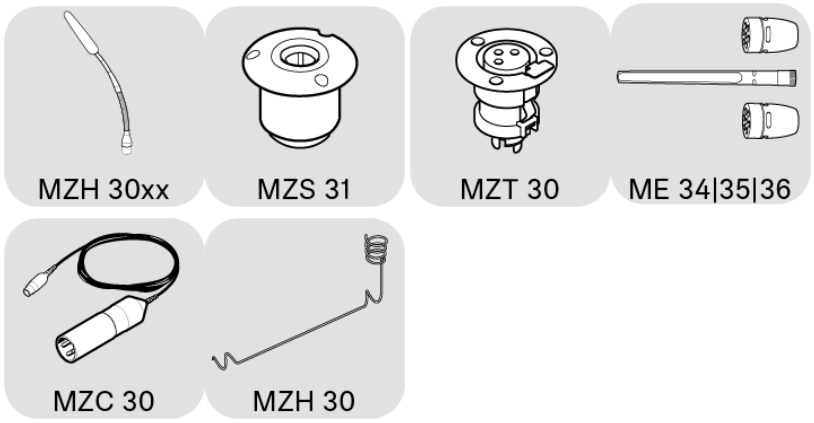
  in the installation surface (panel thickness 10 mm - 65 mm).



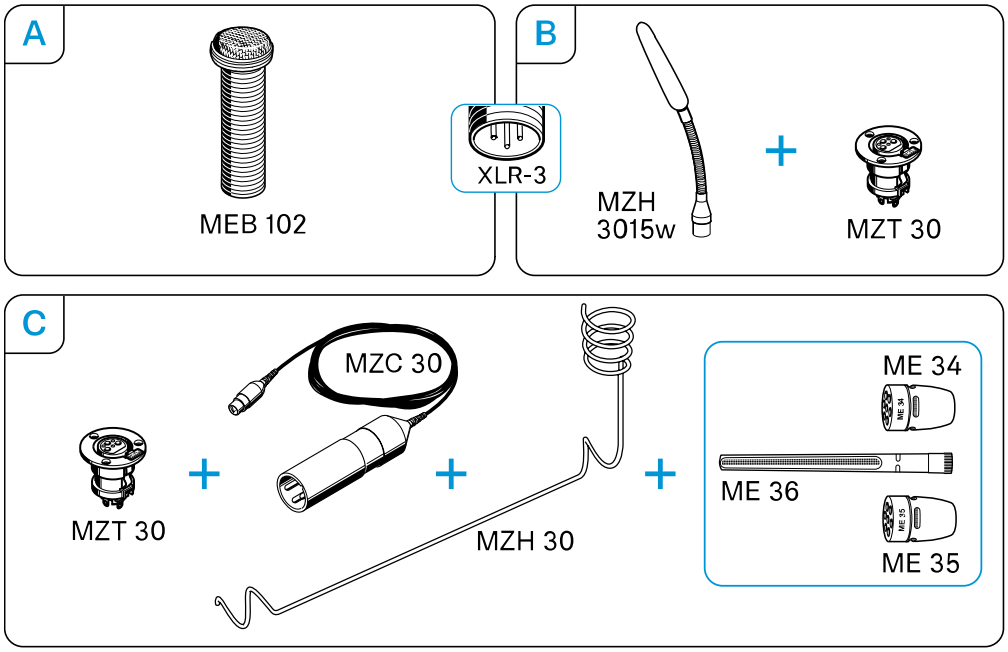
- Insert the installation socket or shock mount into the hole.
- Plug the XLR connector of the gooseneck microphone into a corresponding MZT 30 (-L) connector or into the MZS 31 shock mount.



## Mounting microphones on the ceiling



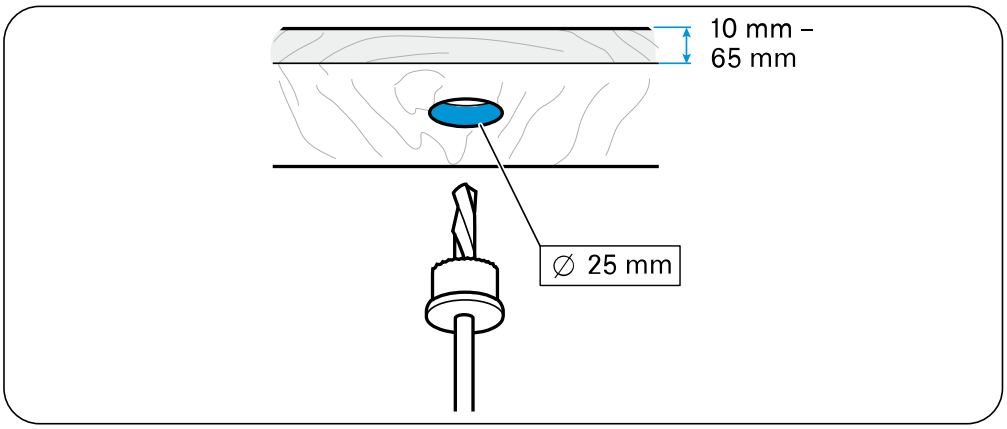

Some microphones in the SpeechLine Wired series are also suitable for mounting on a ceiling panel or a wooden panel on a suspended ceiling.



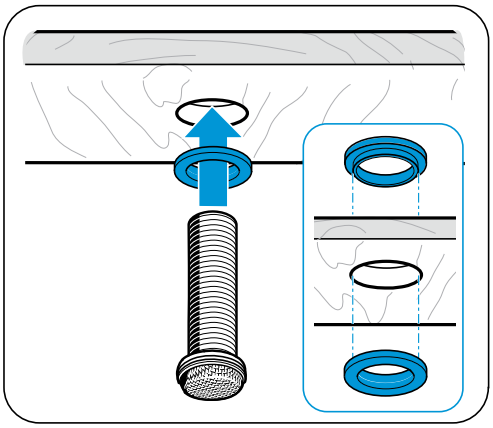
### A) Mounting the MEB 102 boundary installation microphone on the ceiling

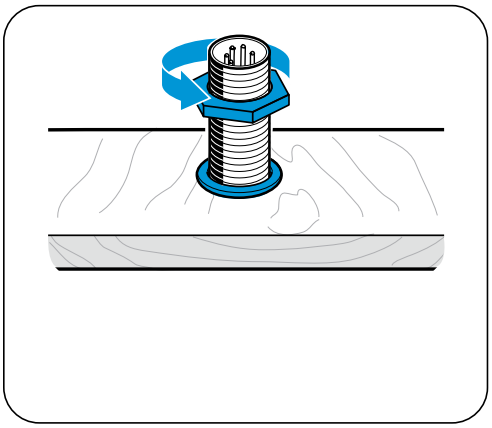

Once you have chosen a position for the product (see Planning the position of the built-in products):

- Drill a hole with a diameter of 25 mm in the installation surface (panel thickness 10 mm - 65 mm).



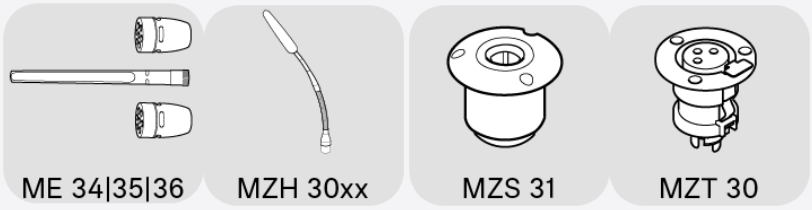

- Slide the first rubber ring onto the thread of the microphone and insert both into the hole.
- Slide the second rubber ring onto the thread and tighten the hex nut.



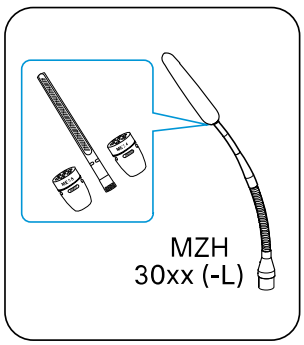


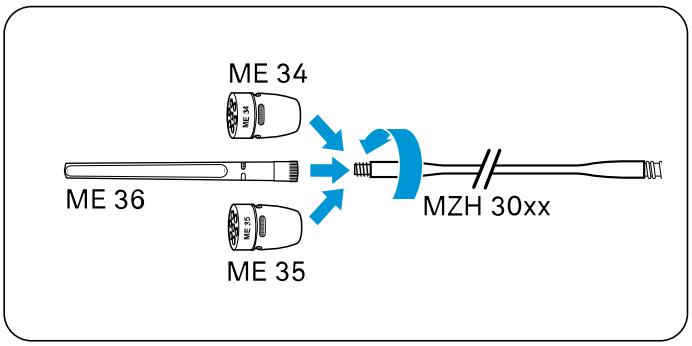
- Connect a suitable cable (see Connecting products to an audio input) and lay it.

**B) Mounting the MZH 3015 gooseneck microphone on the ceiling**




- Screw one of the microphone heads firmly onto the gooseneck to ensure a proper ground connection.

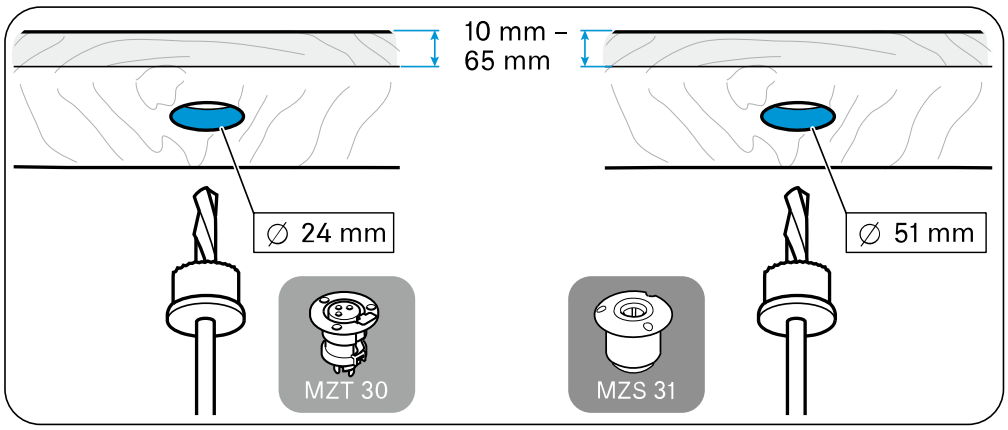



**i** Once you have chosen a position for the product (see Planning the position of the built-in products):

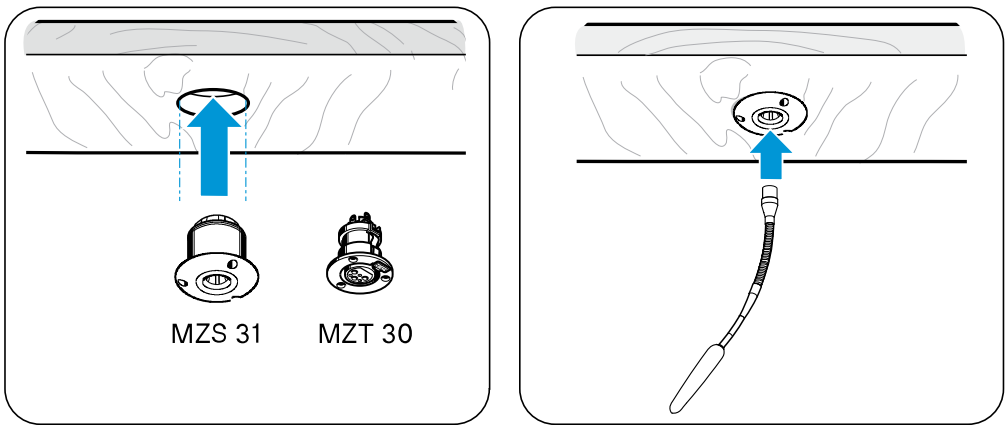
- Drill a hole with a diameter of
  - MZT 30 (-L) table installation socket: 24 mm **OR**
  - MZS 31 shock mount table mount: 51 mm

  in the installation surface (panel thickness 10 mm - 65 mm).




- Insert the installation socket or shock mount into the hole.

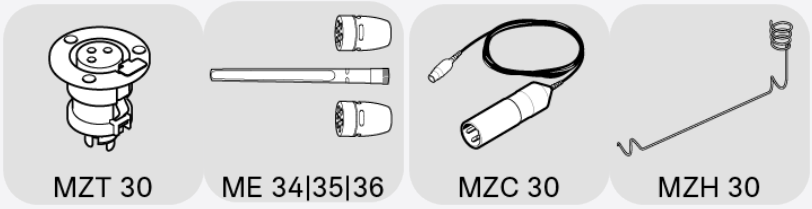
- Plug the XLR connector of the gooseneck microphone into a corresponding MZT 30 connector or into the MZS 31 shock mount.




- Connect a suitable cable (see Connecting products to an audio input) and lay it.

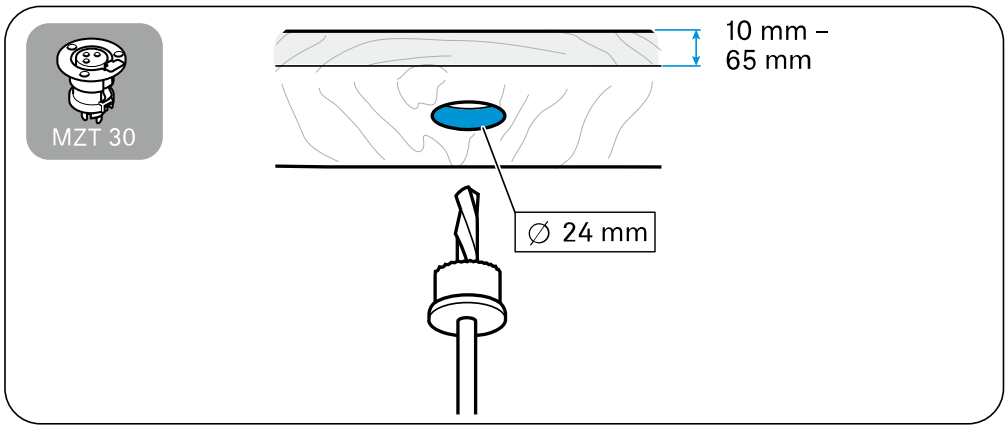
**C) Mounting the ME 3x suspended microphone on the ceiling**

i



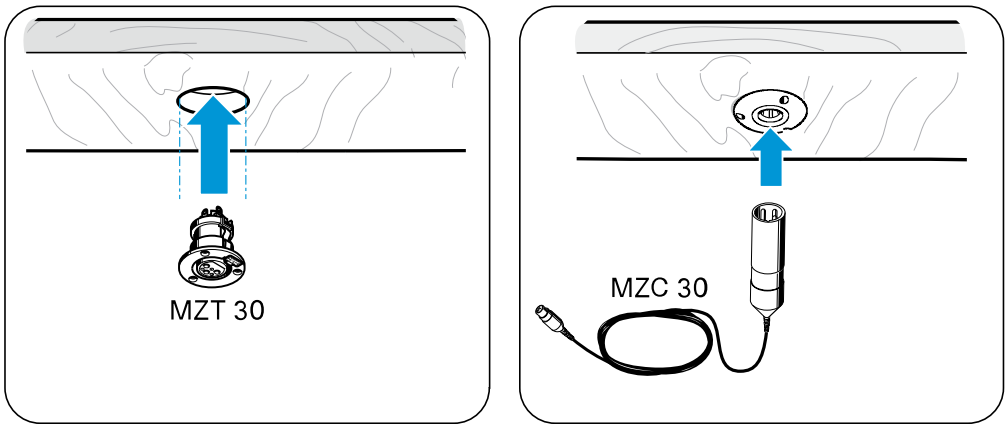

i Once you have chosen a position for the product (see Planning the position of the built-in products):

- Drill a hole with a diameter of 24 mm in the installation surface (panel thickness 10 mm - 65 mm).

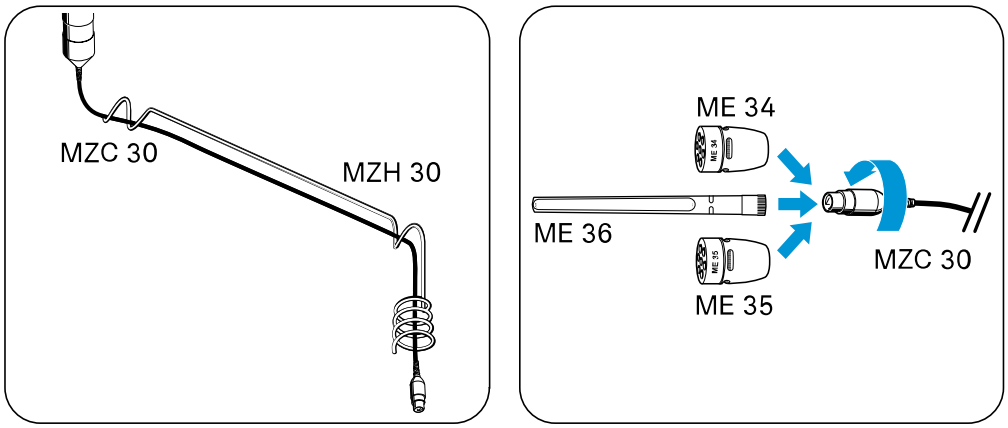



- Insert the installation socket into the hole.

- Plug the XLR connector of the cable into the connector.




- Guide the cable through the MZH 30 suspension.
- Screw one of the microphone heads firmly onto the connector on the cable to ensure a proper ground connection.

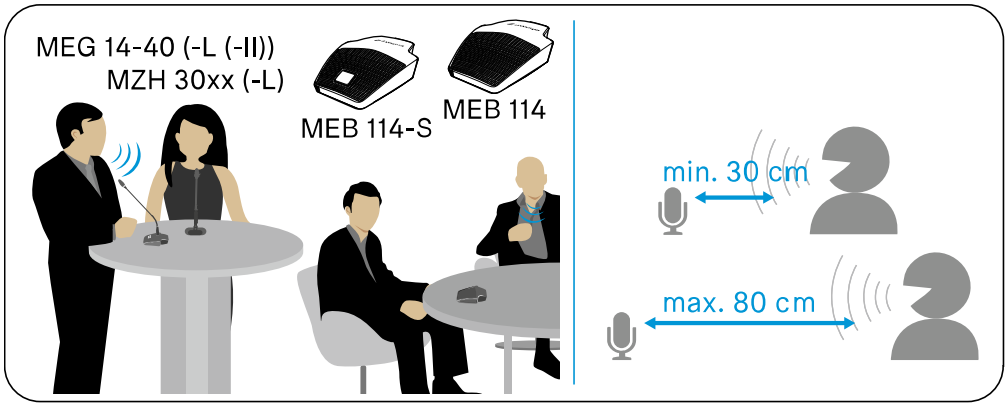



- Connect a suitable cable (see Connecting products to an audio input) and lay it.

## Setting up mobile microphones

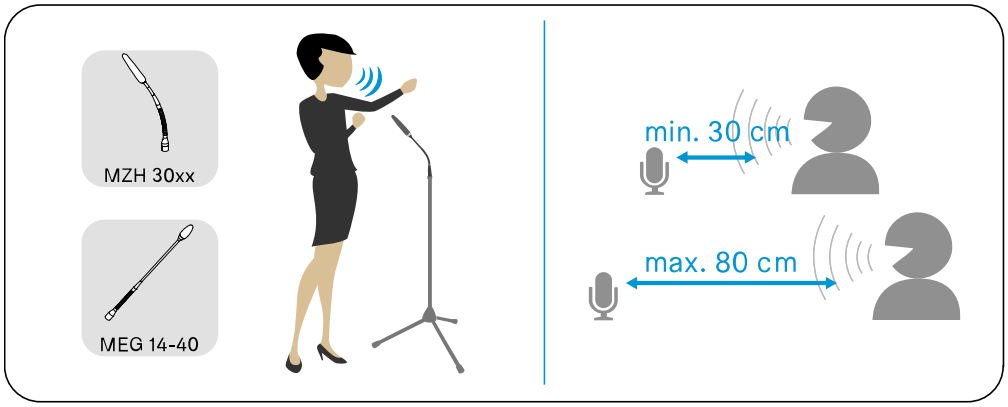
### Setting up table microphones/gooseneck microphones with a table stand


- Position the microphone in such a way that:
  - The distance between the speaker and the microphone is 30 cm to 80 cm (10" to 30") (optimum speech quality) **AND**
  - There are no obstacles, source of interference or moving parts (e.g. PC fans) in the vicinity of the microphone.
- Point the gooseneck microphones toward the speaker.



### Setting up gooseneck microphones with a stand

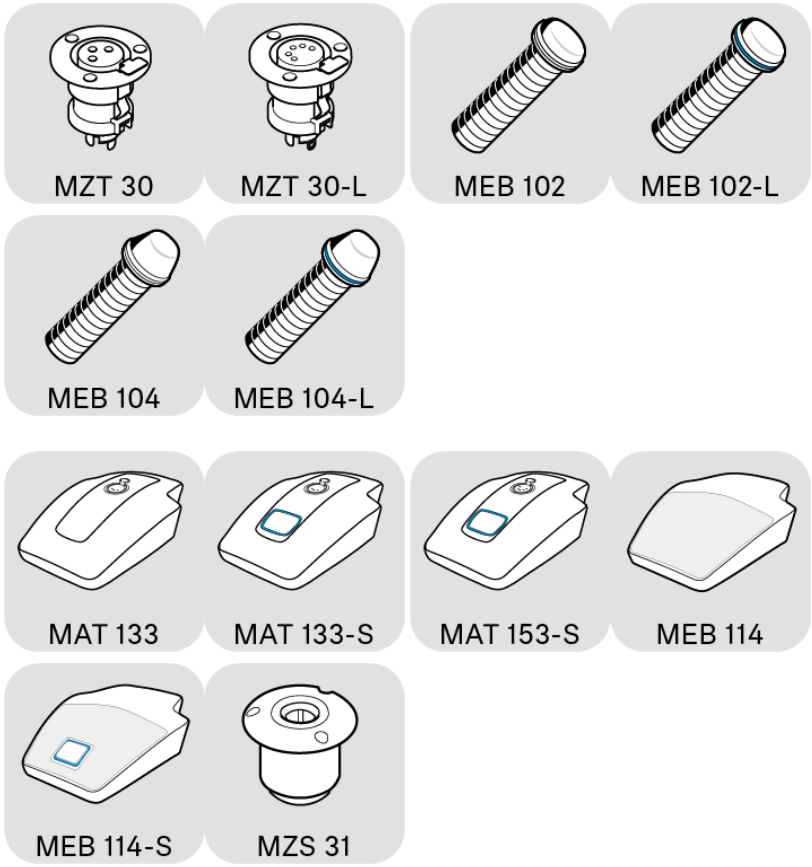

- Position the stand with the microphone in such a way that the distance between the speaker and the microphone is 30 cm to 80 cm (10" to 30") (optimum speech quality).
- Point the gooseneck microphones toward the speaker.



# Connecting products



## Connecting products to an audio input

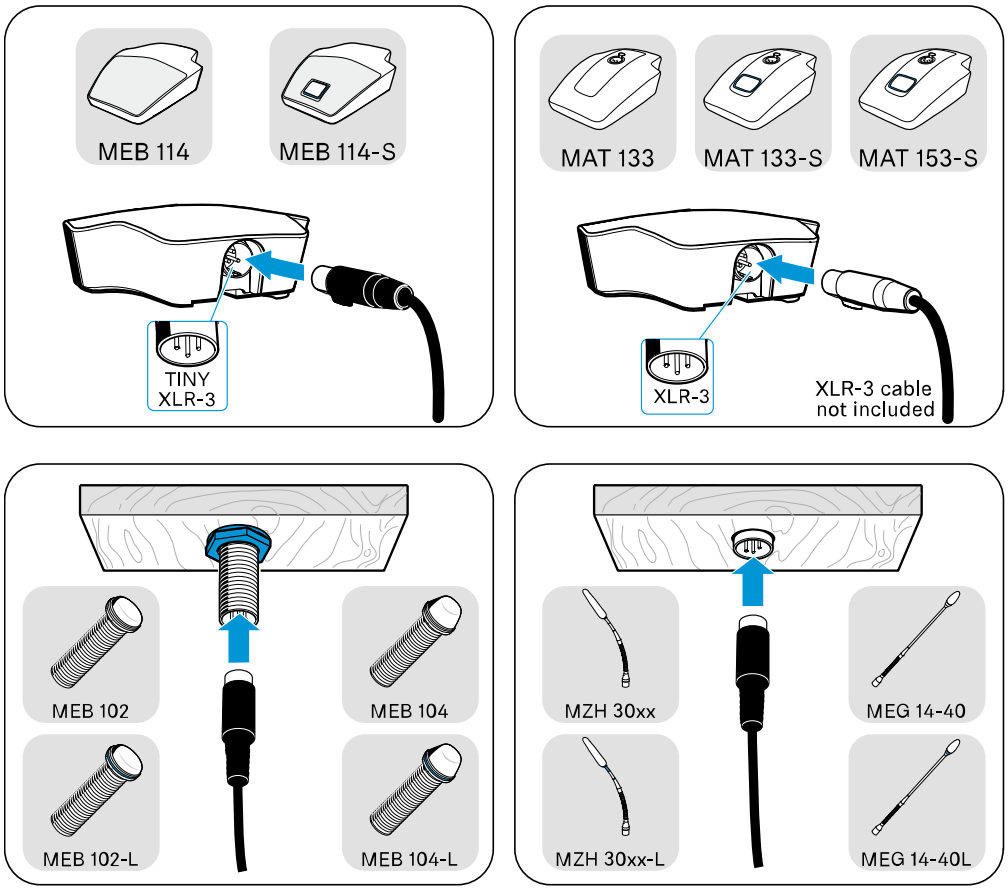



You can connect the products in the SpeechLine Wired series to a suitable audio input as follows:

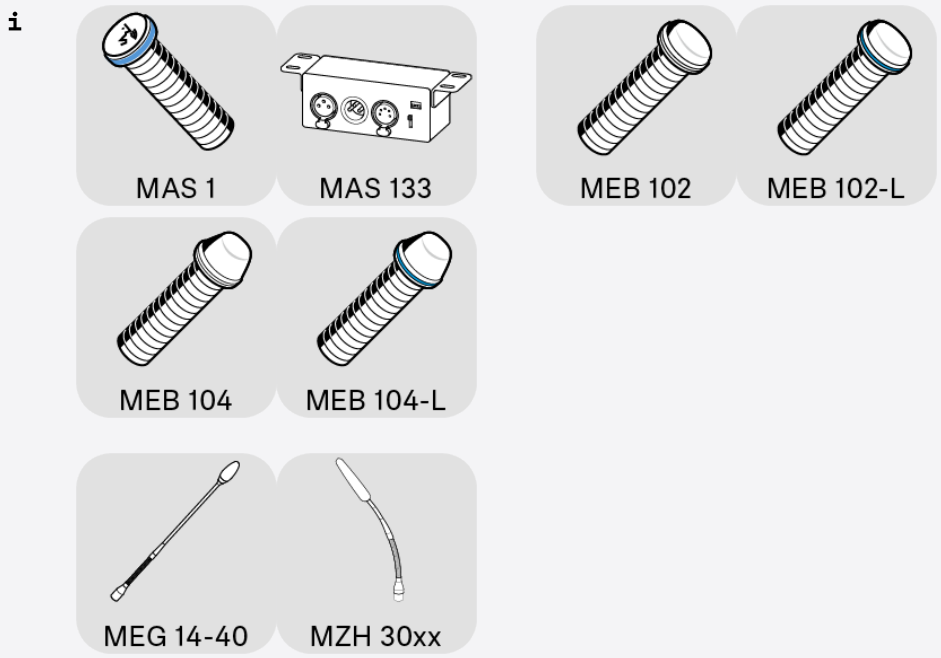
- Via a shielded cable to a mixing console, auto mixer or a digital signal processor (DSP) or
- Via a shielded XLR cable to the MAS 133 switch box with the MAS 1 microphone button this to a mixing console.

**A) Connecting a microphone to a mixing console | auto mixer | digital signal processor (DSP)**

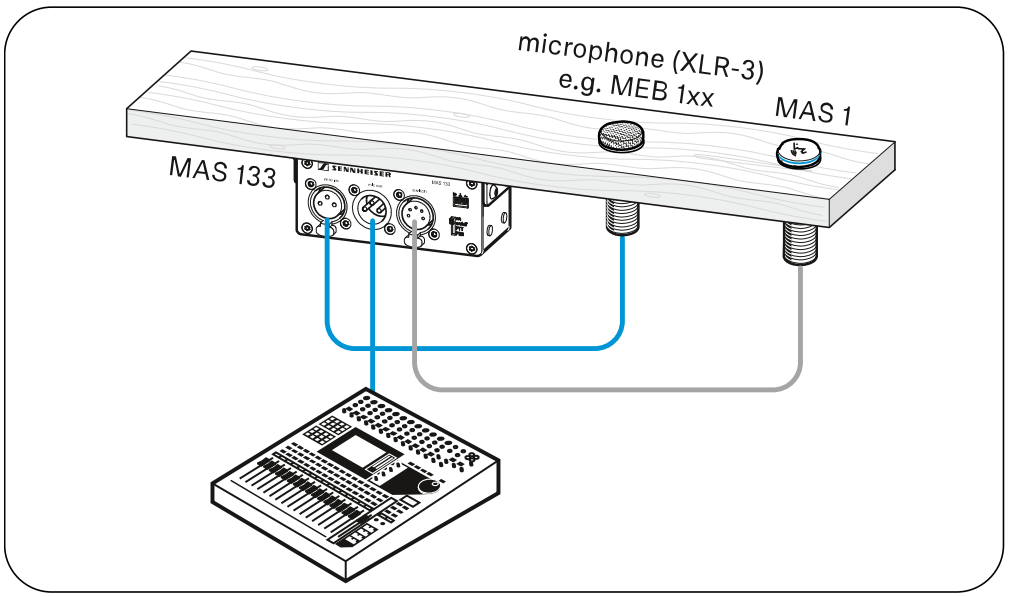
- Use a suitable shielded cable (e.g. XLR to XLR, XLR to connection terminal) to connect the microphone to the mixing console, auto mixer or digital signal processor (DSP). For more information about the connections, see the instruction manual for your DSP.
- Lay the cables in such a way that other people cannot trip over them and injure themselves.



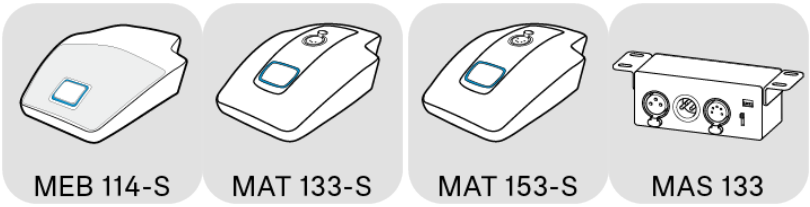
**B) Connecting a microphone | MAS 133 switch box | MAS 1 built-in button to a mixing console**




- Use a shielded XLR-5 cable to connect the MAS 1 built-in button and the MAS 133 switch box (switch connection).
- Connect the microphone (MAS 133: mic in socket) **and** the mixing console (MAS 133: mic out socket) via the MAS 133 switch box using one shielded XLR-3 cable each.



## Connecting products via the logic function




Once you have established an audio connection (see Connecting products to an audio input), you can also connect certain products in the SpeechLine Wired series to the digital signal processor (DSP) via a logic port.

The logic port forwards the switching information of the microphone button (pressed/not pressed) to the DSP. You can also use the logic output on the DSP to control the status of the luminous ring on the microphone button.

The logic output also allows several MAS 133 switch boxes to be integrated and controlled in a system.

The following chapters show

- A) how to connect the MAS 133 switch box to a digital signal processor (DSP) or
- B) to the microphone
- C) an example setup with the Sennheiser TeamConnect system

**A) Connecting the MAS 133 switch box to a digital signal processor (DSP) via the logic function**

i

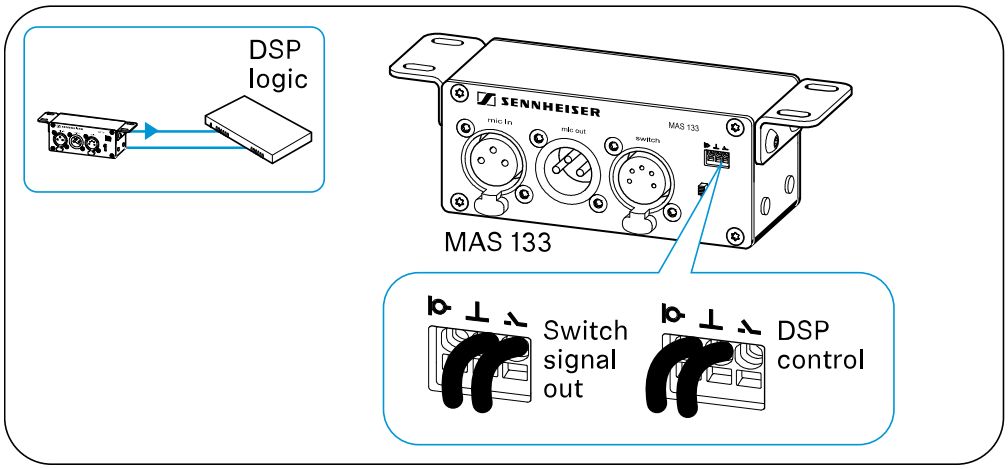

i Depending on how you connect the MAS 133 switch box, different information is passed on to the digital signal processor (DSP).

i **Logic port**

Forwards the switching information of the microphone button – pressed/not pressed – to the digital signal processor.

Forwards the microphone status – active/muted – to the digital signal processor.

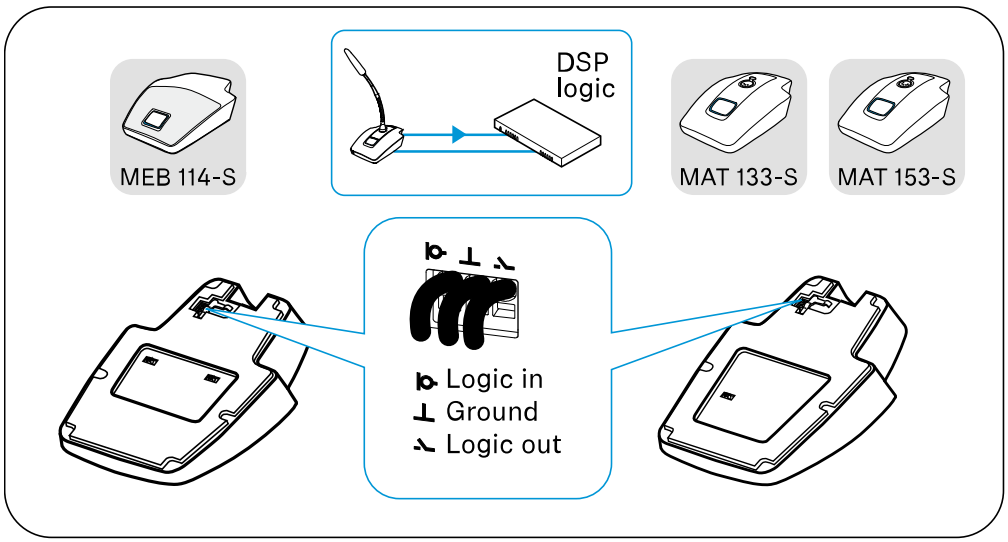
- Using a 2-core cable (Ø 0.14–0.5 $mm^2$), connect the switch box to a “GPIO port” or logic port on the digital signal processor.
- Lay all cables in such a way that other people cannot trip over them and injure themselves.
- Follow the instructions for connection in the operating instructions for your signal processor (DSP).



**B) Connecting microphones to a digital signal processor (DSP) via the logic function**

i To establish a logic connection in addition to the audio connection:

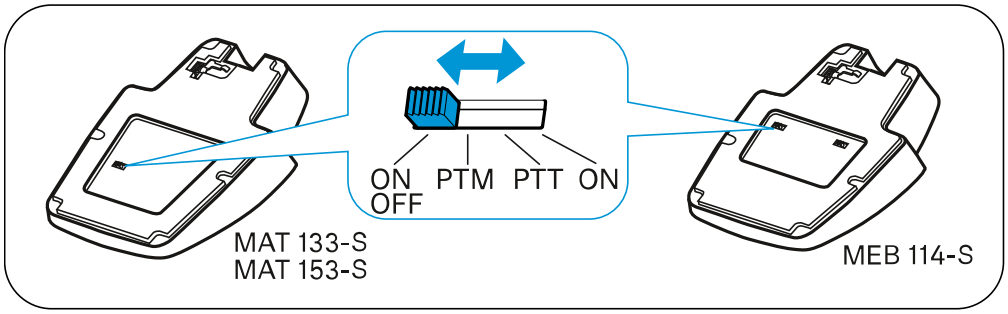
- Using a 3-core cable (Ø 0.14–0.5 $mm^2$), connect the microphone or the microphone base to a “GPIO port” or logic port on the digital signal processor (DSP).
- Lay all cables in such a way that other people cannot trip over them and injure themselves.
- Follow the instructions for connection in the operating instructions for your signal processor (DSP).




- Slide the switch for the microphone button behavior to the ON position to activate “DSP remote mode”.

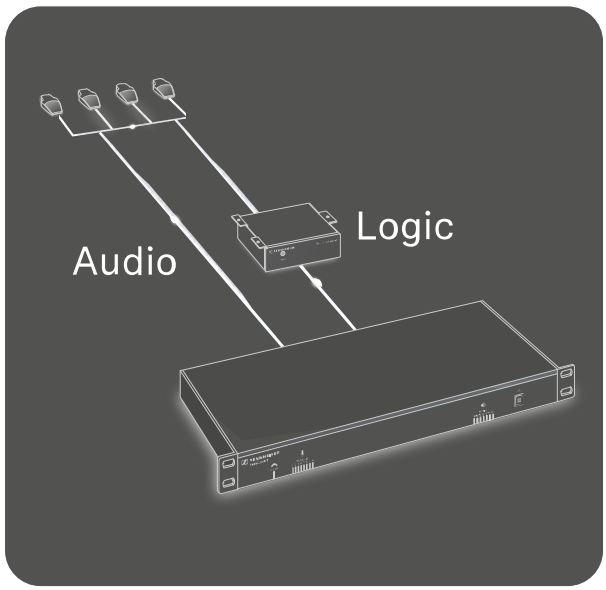
  ✓ The microphone is always active in this setting and is muted or reactivated by the DSP.

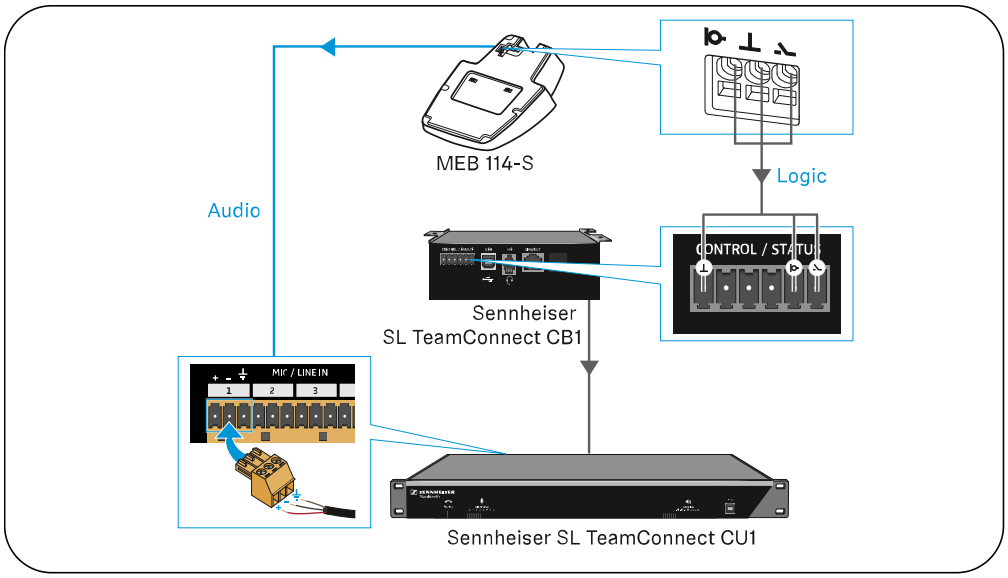
  The microphone thus permanently provides a reference signal for AEC algorithms in the DSP.

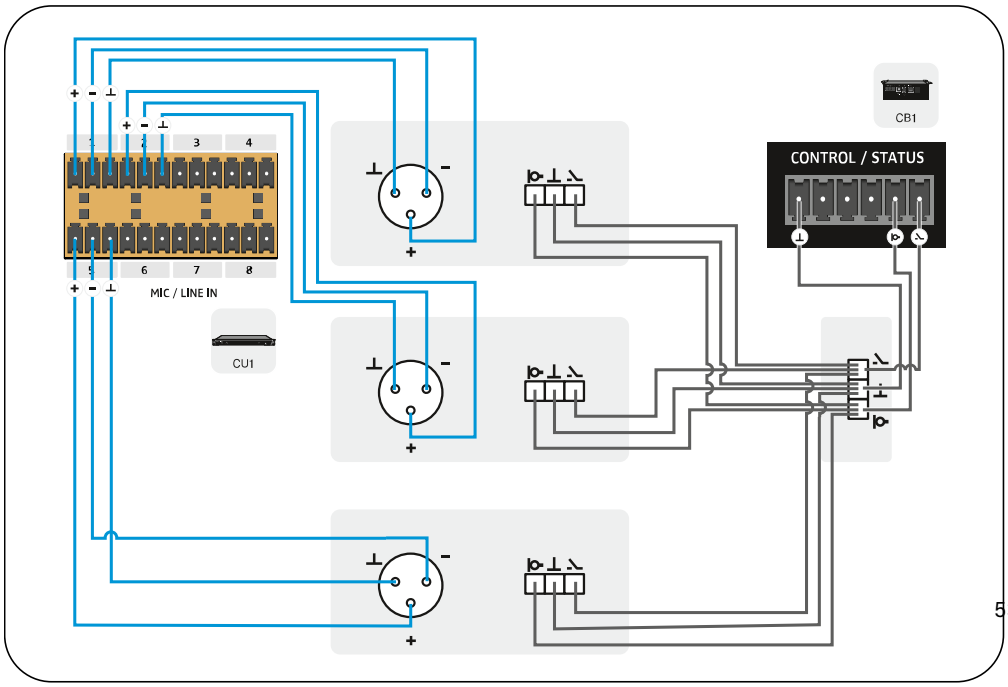



**Example setup with Sennheiser TeamConnect**

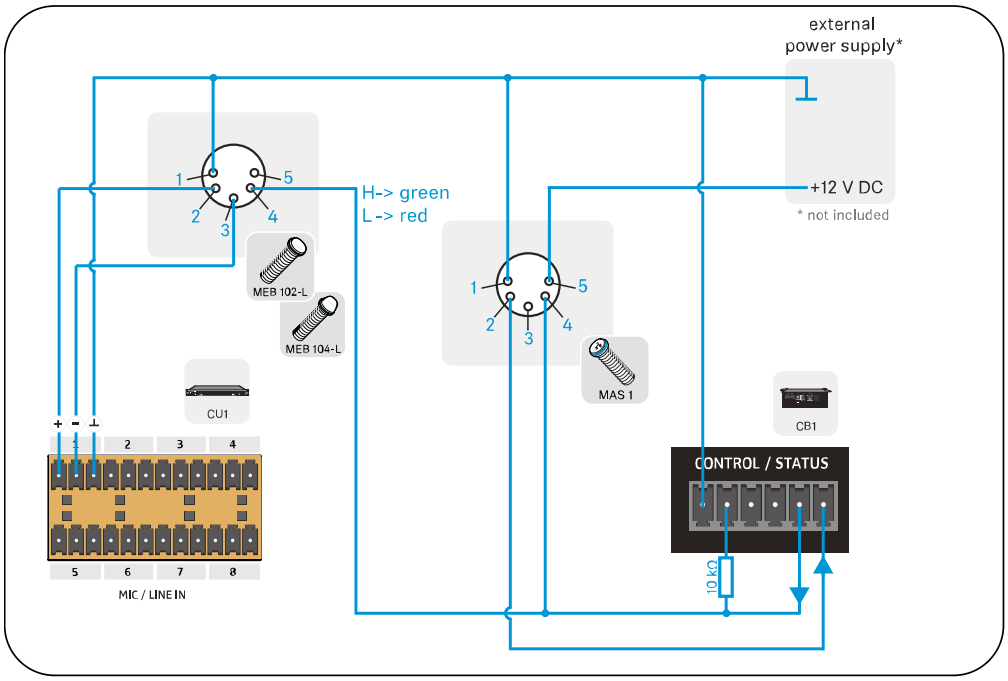
Example setup with XLR-3 microphone



Example setup with XLR-5 microphone and luminous rings



# Setting up and using products

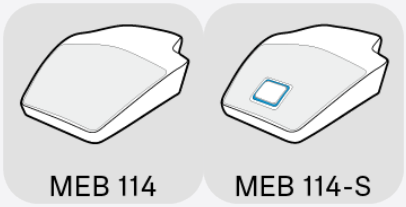


## Leveling out microphones

- Adjust the microphone sensitivity via the mixing console, the auto mixer or the digital signal processor (DSP) so that it neither is neither overdriven nor underdriven. For more information about the audio settings, see the instruction manual for respective device.

  i If interference occurs in the microphone at high field strengths, remove the source of interference from the microphone.

### Setting the “low-cut” filter on the MEB 114 (-S)

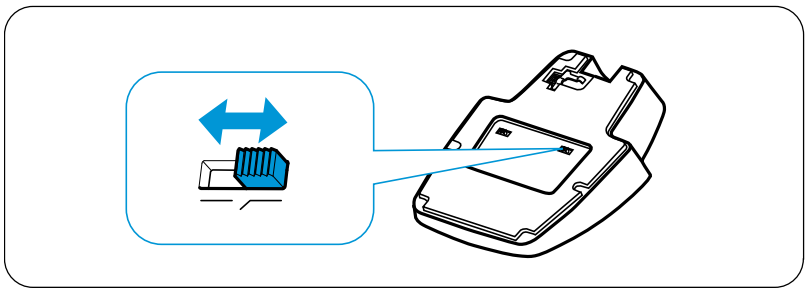



Tables and lecterns transmit sound if the speaker accidentally bumps into them, for example. The “low-cut” filter enables frequencies under 120 Hz to be filtered out and interference reduced.

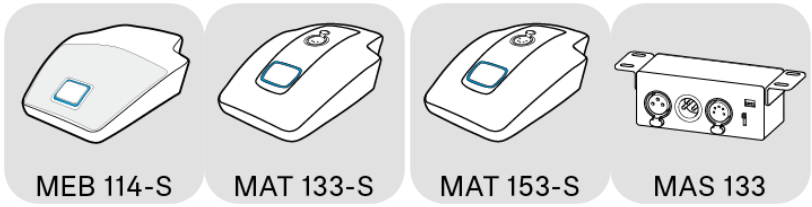
- Slide the switch to the desired position.

“Low-cut” filter deactivated

“Low-cut” filter activated

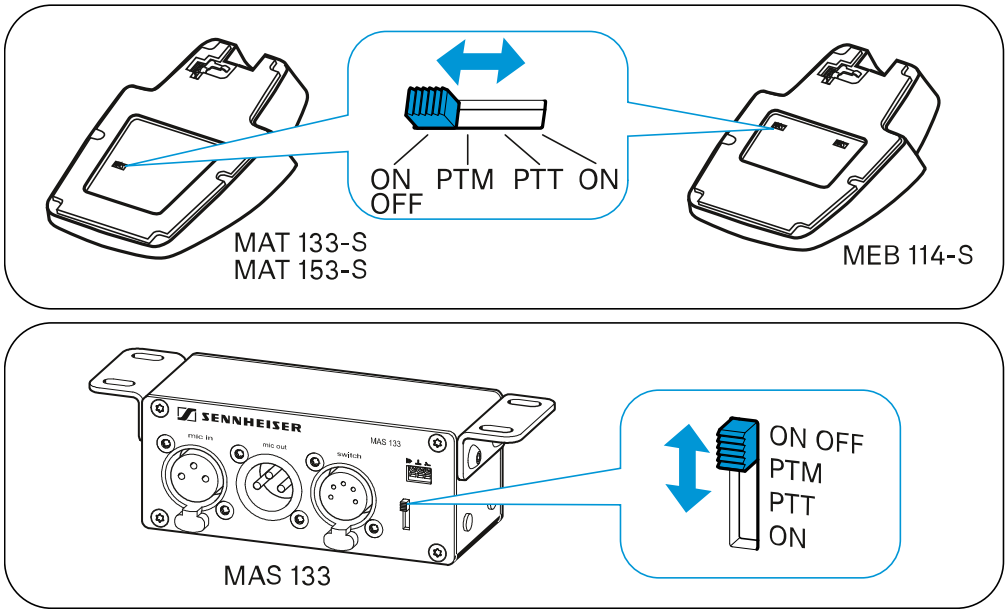


## Setting the switching behavior of the microphone

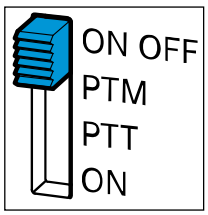



On the products shown here, you can set the switching behavior of the microphone directly using a slide switch.

- Slide the switch to the desired position.



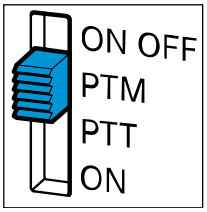

**ON/OFF**




As soon as you press the microphone button, the microphone is:

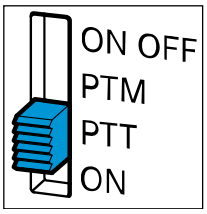
- Activated (lights up green) or
- Muted (lights up red).

**PTM - Push to mute**



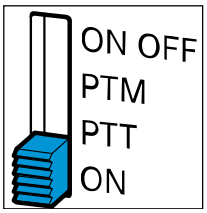

The microphone is active, the microphone button lights up green. As long as you keep the microphone button pressed, it lights up red and the microphone is muted.

**PTT - Push to talk**




The microphone is muted, the microphone button lights up red. As long as you keep the microphone button pressed, it lights up green and the microphone is activated.

**ON**




- Protection against incorrect operation: The microphone is permanently activated. This setting prevents interruptions caused by accidentally pressing the microphone button.
- DSP remote mode: The microphone is connected to a digital signal processor (DSP) via a logic connection. In this settings, the ON, OFF, PTT and PTM functions can be taken over by the digital signal processor (DSP).

## Muting/activating microphones

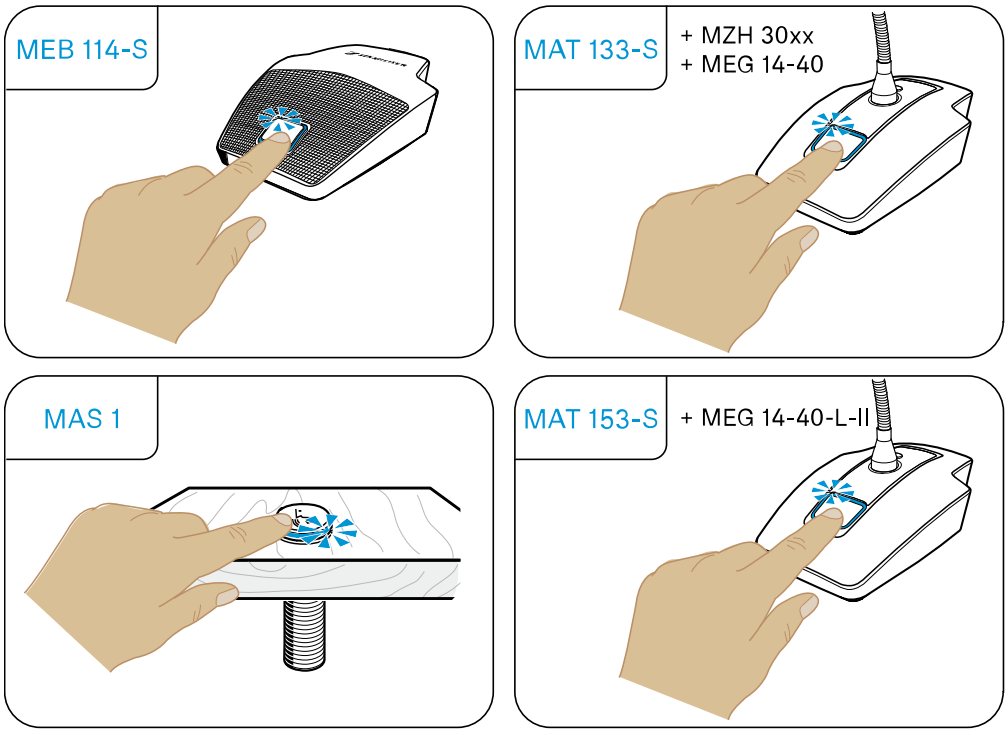

These products use LEDs to indicate whether the microphone is muted or activated. The LEDs light up as soon as the products are supplied with power via the mixing console, auto mixer or the digital signal processor (DSP).

You use the switching behavior to determine whether a microphone is permanently activated or muted or whether a button press switches between these states (see Setting the switching behavior of the microphone). In the ON setting, the microphone is always active and the microphone button is deactivated.

▶ Press the microphone button; the LED lights up:

- green = microphone is active
- red* = microphone is muted

*This function is not supported by all mixing consoles, auto mixers and digital signal processors (DSP).




✓ The luminous rings on the microphones and switches light up synchronously.

# Cleaning and maintenance

**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.

**Boundary microphones**
MEB 114
MEB 114-S

**Boundary installation microphones**
MEB 102
MEB 102-L
MEB 104
MEB 104-L

**Gooseneck microphones**
MZH 30xx
MZH 30xx-L
MEG 14-40
MEG 14-40-L
MEG 14-40-L-II

**Microphone Heads**
ME 34
ME 35
ME 36

MAS 133 switch box
MAS 1

**Table stands**
MAT 133
MAT 133-S
MAT 153-S

**Shock/installation mounts**
MZS 31
MZT 30
MZT 30-L

MZC 30

# Boundary microphones



## MEB 114

### Specifications

**Pick-up pattern**

- Cardioid

**Frequency response**

- 40 – 20,000 Hz

**Acoustic operating principle**

- Boundary microphone

**Output impedance at 1 kHz**

- 200 Ω

**Sensitivity**

- 10 mV/Pa

**Maximum sound pressure level**

- 140 dB at 1 kHz

**Equivalent noise level**

- 29 dB(A)
- 39 dB(CCIR)

**Dynamic range**

- 111 dB(A)

**Power supply**

- 48 V phantom power

**Current consumption**

- 1.5 mA

**Connector**

- Mini-XLR 3

**Weight**

- Approx. 291 g

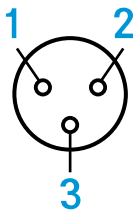
**Dimensions (W x H x D)**

- 85 x 25 x 100 mm

**Temperature**

- Operation: -10 °C to +50 °C (14 °F to 122 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## Connector assignment

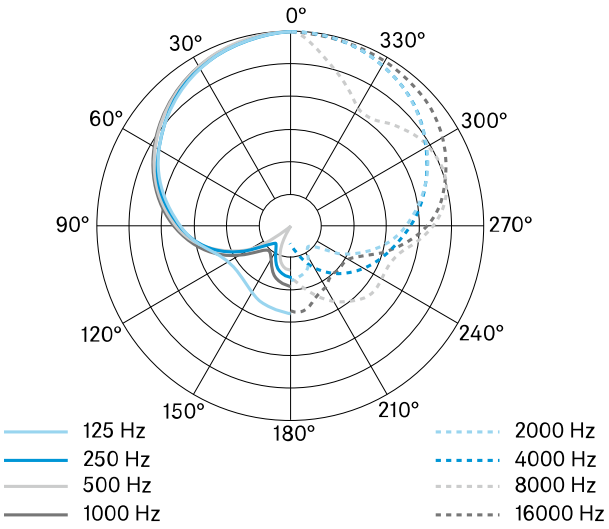



1 GND

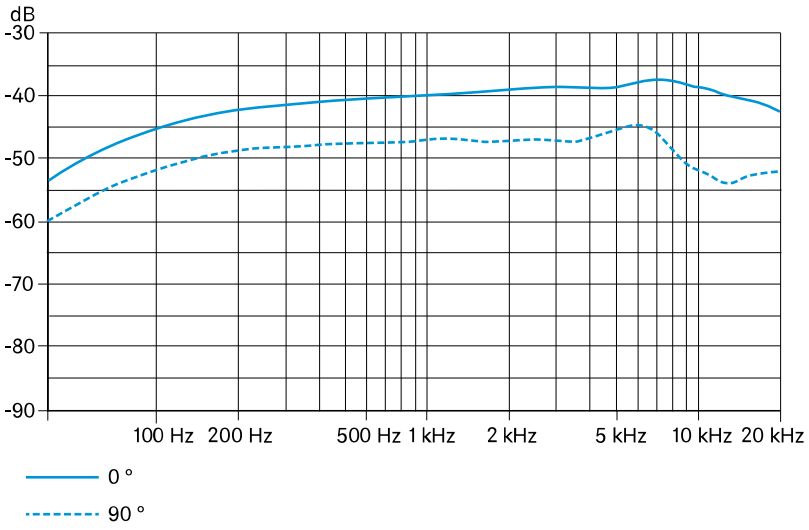
2 Audio +

3 Audio -

## Polar diagram




## Frequency response



# MEB 114-S

## Specifications

**Pick-up pattern**

- Cardioid

**Frequency response**

- 40 – 20,000 Hz

**Acoustic operating principle**

- Boundary microphone

**Microphone activation modes**

- Toggle on/off
- Push To Mute (PTM)
- Push To Talk (PTT)
- Permanent on (external LED control)

**Output impedance at 1 kHz**

- 200 Ω

**Sensitivity**

- 10 mV/Pa

**Maximum sound pressure level**

- 140 dB at 1 kHz

**Equivalent noise level**

- 29 dB(A)
- 39 dB(CCIR)

**Dynamic range**

- 111 dB(A)

**Power supply**

- 48 V phantom power

**Current consumption**

- 5.3 mA (microphone/luminous ring each: 2.65 mA)

**Logic input**

- High-level input voltage > 2.0 V
- Low-level input voltage < 0.8 V

**Logic output**

- High-level output voltage > 2.4 V
- Low-level output voltage < 0.4 V

**Connector**

- Mini-XLR 3

**Weight**

- Approx. 291 g

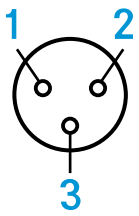
**Dimensions (W x H x D)**

- 85 x 25 x 100 mm

**Temperature**

- Operation: -10 °C to +50 °C (14 °F to 122 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## Connector assignment

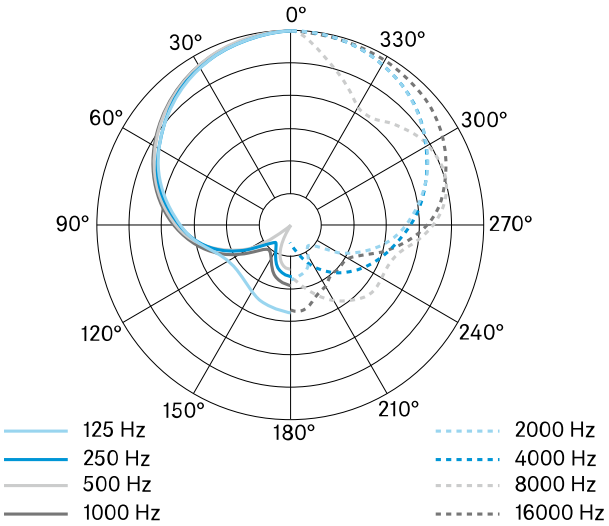



1 GND

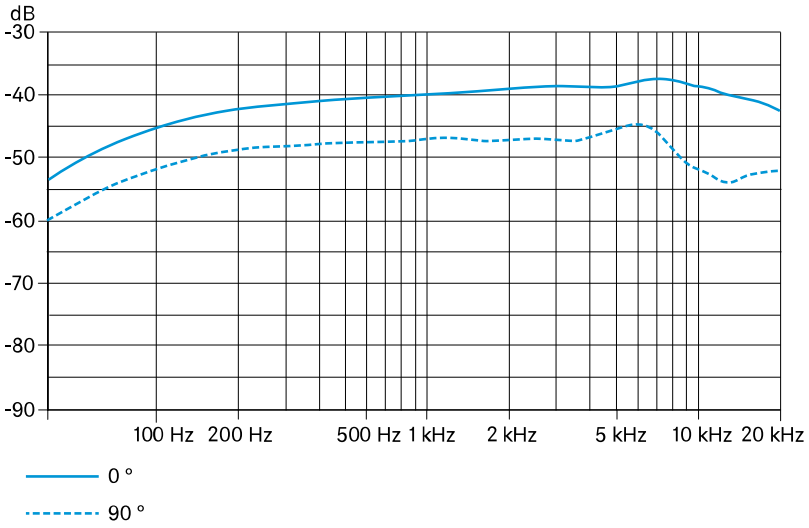
2 Audio
+

3 Audio -

## Polar diagram




## Frequency response



# Boundary installation microphones



## MEB 102

### Specifications

**Pick-up pattern**

- Omni-directional

**Frequency response**

- 40 – 20,000 Hz

**Acoustic operating principle**

- Boundary microphone

**Output impedance at 1 kHz**

- 200 Ω

**Sensitivity**

- 16 mV/Pa

**Maximum sound pressure level**

- 125 dB at 1 kHz < 3 %

**Equivalent noise level**

- 21 dB(A)
- 31 dB(CCIR)

**Dynamic range**

- 104 dB(A)

**Power supply**

- 24 V – 48 V phantom power (P 24 – P 48)

**Current consumption**

- 3 mA

**Connector**

- XLR-3M

**TTL level for LED activation**

- High > 2.4 V
- Low < 0.4 V

**Weight**

- 58 g

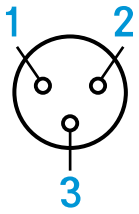
**Dimensions**

- Installation height: approx. 12 mm
- Total height: approx. 83 mm
- Microphone head diameter: approx. 29 mm
- Thread diameter: approx. 20 mm
- Thread: M20 x 1.5
- Rubber washer diameter: approx. 23 mm

**Temperature**

- Operation: 0 °C to +40 °C (32 °F to 104 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

### Connector assignment

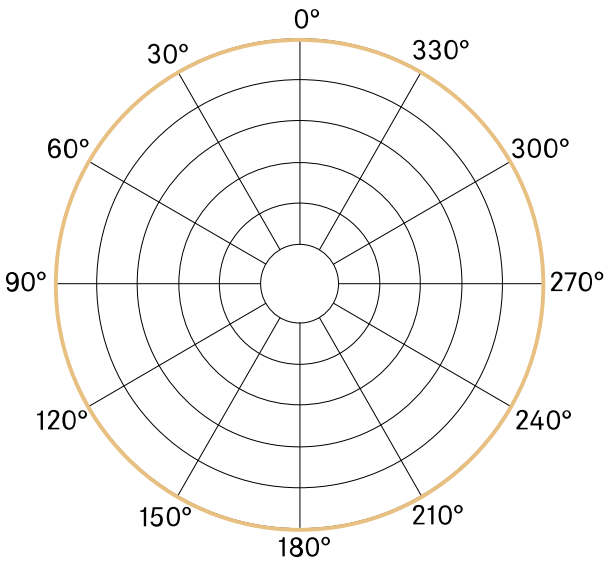



1 GND

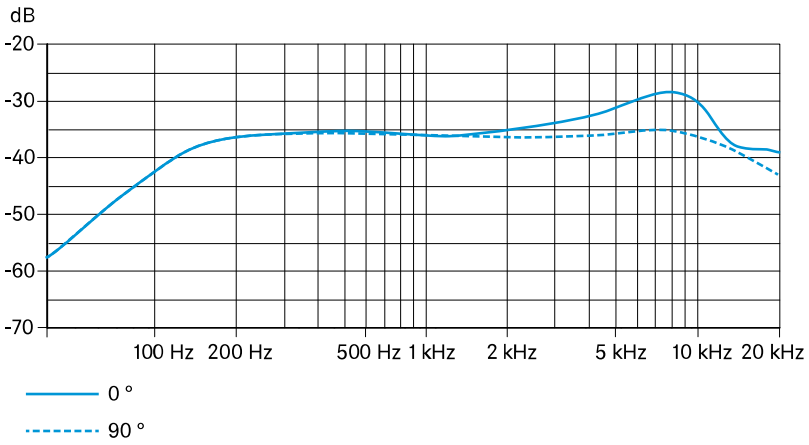
2 Audio +

3 Audio -

### Polar diagram



## Frequency response



# MEB 102-L

## Specifications

**Pick-up pattern**

- Omni-directional

**Frequency response**

- 40 – 20,000 Hz

**Acoustic operating principle**

- Boundary microphone

**Output impedance at 1 kHz**

- 200 Ω

**Sensitivity**

- 16 mV/Pa

**Maximum sound pressure level**

- 125 dB at 1 kHz < 3 %

**Equivalent noise level**

- 21 dB(A)
- 31 dB(CCIR)

**Dynamic range**

- 104 dB(A)

**Power supply**

- 24 V – 48 V phantom power (P 24 – P 48)

**Current consumption**

- 6 mA (microphone/luminous ring each 3 mA)

**Connector**

- XLR-5M

**TTL level for LED activation**

- High > 2.4 V
- Low < 0.4 V

**Weight**

- 58 g

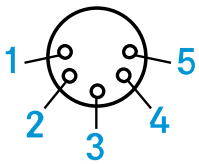
**Dimensions**

- Installation height: approx. 12 mm
- Total height: approx. 83 mm
- Microphone head diameter: approx. 29 mm
- Thread diameter: approx. 20 mm
- Thread: M20 x 1.5
- Rubber washer diameter: approx. 23 mm

**Temperature**

- Operation: 0 °C to +40 °C (32 °F to 104 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## Connector assignment




1 GND

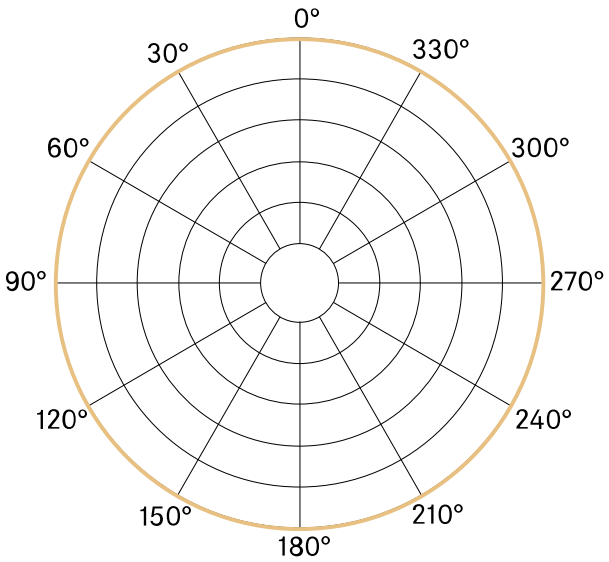
2 Audio +

3 Audio -

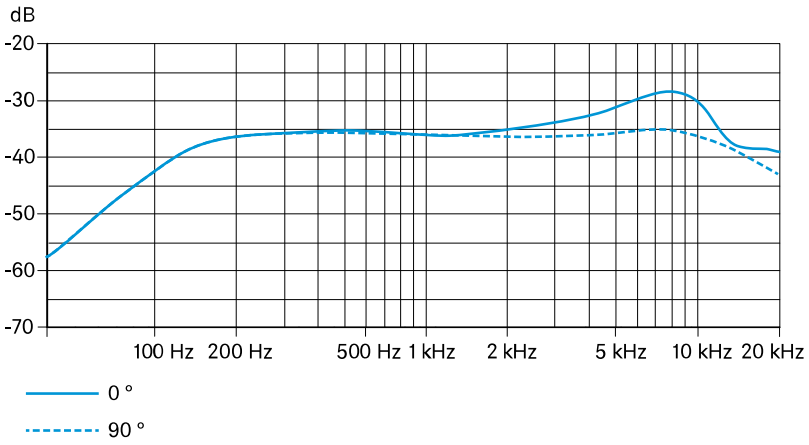
4 LED green (control signal)

5 LED red (standard)

## Polar diagram




## Frequency response



# MEB 104

## Specifications

**Pick-up pattern**

- Cardioid

**Frequency response**

- 40 – 20,000 Hz

**Acoustic operating principle**

- Boundary microphone

**Output impedance at 1 kHz**

- 200 Ω

**Sensitivity**

- 14 mV/Pa

**Maximum sound pressure level**

- 125 dB at 1 kHz < 3 %

**Equivalent noise level**

- 28 dB(A)
- 38 dB(CCIR)

**Dynamic range**

- 97 dB(A)

**Power supply**

- 24 V – 48 V phantom power (P 24 – P 48)

**Current consumption**

- 3 mA

**Connector**

- XLR-3M

**TTL level for LED activation**

- High > 2.4 V
- Low < 0.4 V

**Weight**

- 60 g

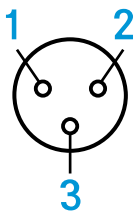
**Dimensions**

- Installation height: approx. 19 mm
- Total height: approx. 90 mm
- Microphone head diameter: approx. 29 mm
- Thread diameter: approx. 20 mm
- Thread: M20 x 1.5
- Rubber washer diameter: approx. 23 mm

**Temperature**

- Operation: 0 °C to +40 °C (32 °F to 104 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## Connector assignment

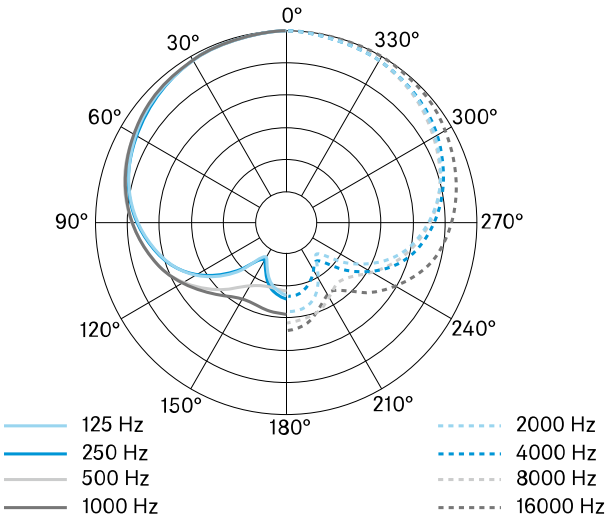



1 GND

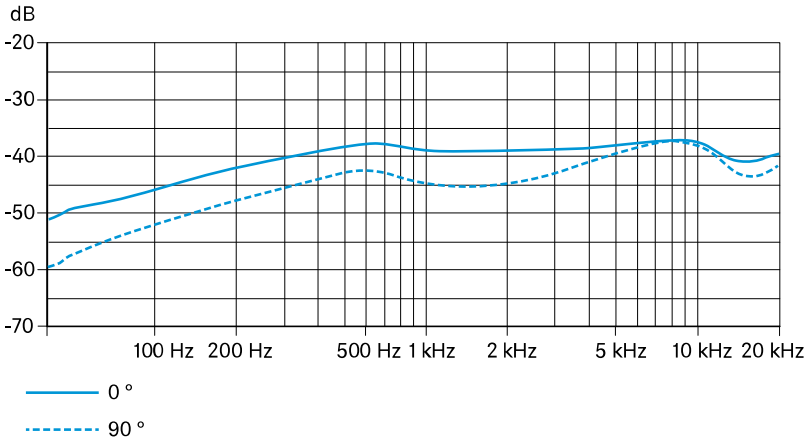
2 Audio +

3 Audio -

## Polar diagram




## Frequency response



# MEB 104-L

## Specifications

**Pick-up pattern**

- Cardioid

**Frequency response**

- 40 – 20,000 Hz

**Acoustic operating principle**

- Boundary microphone

**Output impedance at 1 kHz**

- 200 Ω

**Sensitivity**

- 14 mV/Pa

**Maximum sound pressure level**

- 125 dB at 1 kHz < 3 %

**Equivalent noise level**

- 28 dB(A)
- 38 dB(CCIR)

**Dynamic range**

- 97 dB(A)

**Power supply**

- 24 V – 48 V phantom power (P 24 – P 48)

**Current consumption**

- 6 mA (microphone/luminous ring each 3 mA)

**Connector**

- XLR-5M

**TTL level for LED activation**

- High > 2.4 V
- Low < 0.4 V

**Weight**

- 60 g

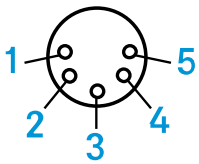
**Dimensions**

- Installation height: approx. 19 mm
- Total height: approx. 90 mm
- Microphone head diameter: approx. 29 mm
- Thread diameter: approx. 20 mm
- Thread: M20 x 1.5
- Rubber washer diameter: approx. 23 mm

**Temperature**

- Operation: 0 °C to +40 °C (32 °F to 104 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## Connector assignment




1 GND

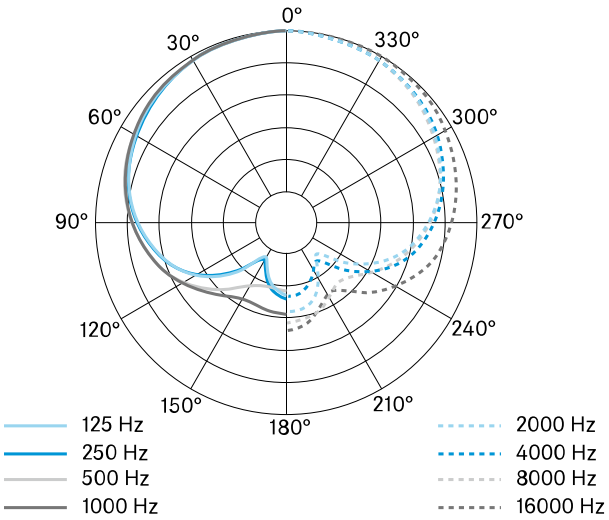
2 Audio +

3 Audio -

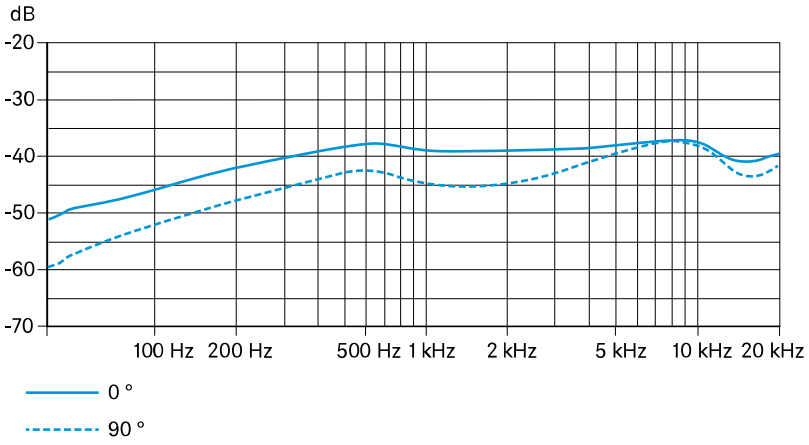
4 LED green (control signal)

5 LED red (standard)

## Polar diagram




## Frequency response



# Gooseneck microphones



## MZH 30xx

### Specifications

**Pick-up pattern**

- dependent on microphone head ME 3x

**Acoustic operating principle**

- Gooseneck microphone (capacitor)

**Power supply**

- 12 V – 48 V phantom power (P 12 – P 48)

**Current consumption**

- 3 mA

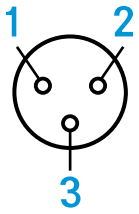
**Connector**

- XLR-3M

**Temperature**

- Operation: 0 °C to +40 °C (32 °F to 104 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

### Connector assignment




1 GND

2 Audio +

3 Audio -

# MZH 30xx-L

## Specifications

### Pick-up pattern

- dependent on microphone head ME 3x

### Acoustic operating principle

- Gooseneck microphone (capacitor)

### Power supply

- 12 V – 48 V phantom power (P 12 – P 48)

### Current consumption

- 18 mA (microphone/luminous ring each 9 mA)

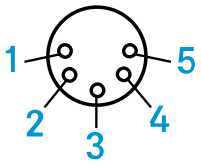
### Connector

- XLR-5M

### Temperature

- Operation: 0 °C to +40 °C (32 °F to 104 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## Connector assignment




1 GND

2 Audio +

3 Audio -

4 LED: DC 9 – 30 V every polarity

5 LED: DC 9 – 30 V every polarity

# MEG 14-40

## Specifications

**Pick-up pattern**

- Cardioid

**Frequency response**

- 50 – 20,000 Hz

**Acoustic operating principle**

- Gooseneck microphone (capacitor)

**Output impedance**

- 100 Ω

**Maximum sound pressure level**

- 130 dB SPL

**Equivalent noise level**

- 37 dB(A)
- 26 dB(CCIR)

**Power supply**

- 48 V phantom power

**Current consumption**

- 3 mA

**Connector**

- XLR-3M

**Length**

- 450 mm

**Diameter**

- 8 mm

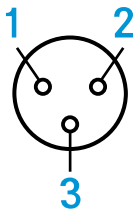
**Weight**

- 147 g

**Temperature**

- Operation: 0 °C to +40 °C (32 °F to 104 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## Connector assignment

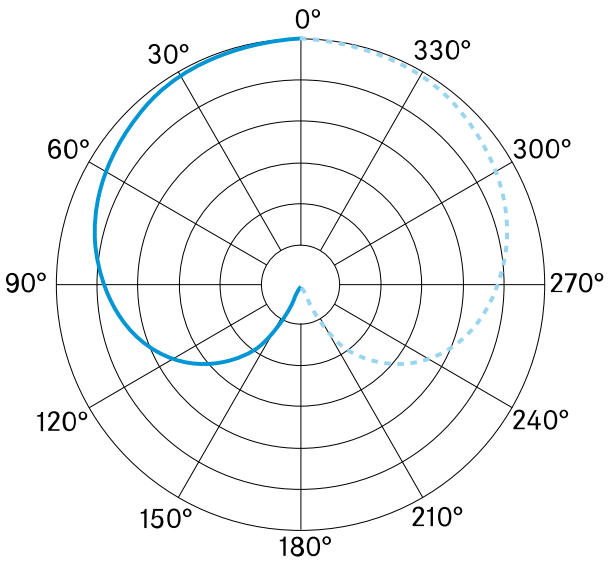



1 GND

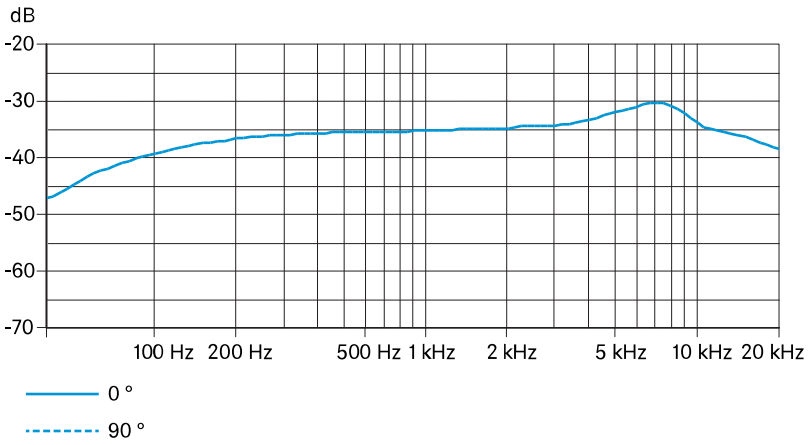
2 Audio +

3 Audio -

## Polar diagram



## Frequency response



# MEG 14-40-L

## Specifications

**Pick-up pattern**

- Cardioid

**Frequency response**

- 50 – 20,000 Hz

**Acoustic operating principle**

- Gooseneck microphone (capacitor)

**Output impedance**

- 100 Ω

**Maximum sound pressure level**

- 130 dB SPL

**Equivalent noise level**

- 37 dB(A)
- 26 dB(CCIR)

**Power supply**

- 48 V phantom power

**Current consumption**

- 3 mA

**Luminous ring power supply**

- DC 9 – 30 V
- Approx. 18 mA
- red

**Connector**

- XLR-5M

**Length**

- 450 mm

**Diameter**

- 8 mm

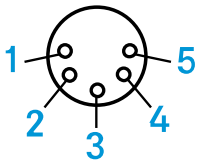
**Weight**

- 147 g

**Temperature**

- Operation: 0 °C to +40 °C (32 °F to 104 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## Connector assignment




1 GND

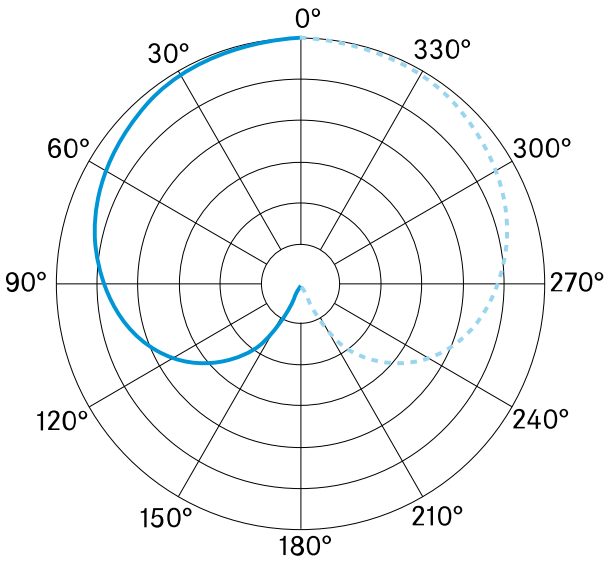
2 Audio +

3 Audio -

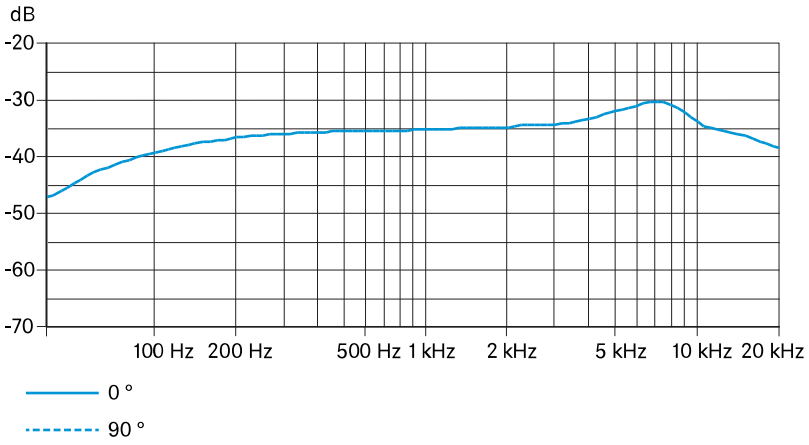
4 LED: DC 9 – 30 V every polarity

5 LED: DC 9 – 30 V every polarity

## Polar diagram




## Frequency response



# MEG 14-40-L-II

## Specifications

**Pick-up pattern**

- Cardioid

**Frequency response**

- 50 – 20,000 Hz

**Acoustic operating principle**

- Gooseneck microphone (capacitor)

**Output impedance at 1 kHz**

- < 100 Ω

**Sensitivity**

- 15 mV/Pa

**Maximum sound pressure level**

- 130 dB at 1 kHz < 3 %

**Equivalent noise level**

- 37 dB(A)
- 26 dB(CCIR)

**Power supply**

- 48 V phantom power

**Current consumption**

- 3 mA

**Luminous ring power supply**

- DC 10 – 30 V
- 1 – 18 mA
- green

**Connector**

- XLR-5M

**Length**

- 450 mm

**Diameter**

- 8 mm

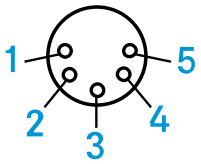
**Weight**

- 147 g

**Temperature**

- Operation: 0 °C to +40 °C (32 °F to 104 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## Connector assignment




1 Microphone GND

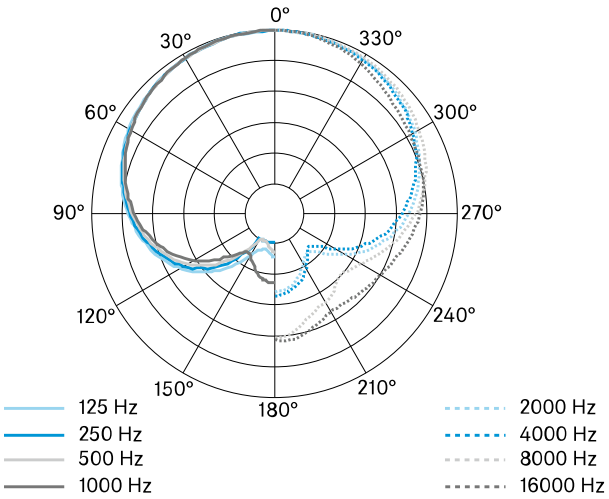
2 Audio +

3 Audio -

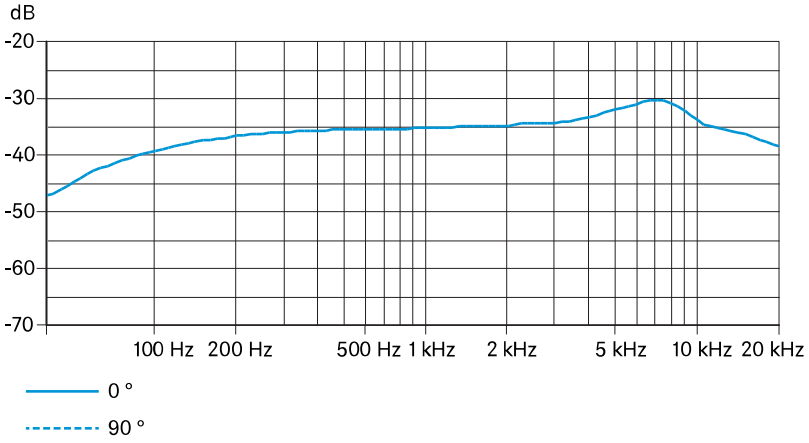
4 LED GND

5 LED: DC 12 – 30 V

## Polar diagram




## Frequency response



# Microphone Heads



## ME 34

### Specifications

**Pick-up pattern**

- Cardioid

**Frequency response**

- 40 – 20,000 Hz

**Acoustic operating principle**

- pressure gradient transducer

**Sensitivity**

- 10 mV/Pa

**Electrical impedance**

- 50 Ω

**Min. terminating impedance**

- 1 kΩ

**Equivalent noise level**

- 37 dB (CCIR)
- 26 dB (A)

**Power supply via MZH 30xx**

- 12 V – 48 V phantom power (P 12 – P 48)

**Microphone power consumption**

- 250 µA

**Dimensions**

- Ø 12 x L18

**Weight without MZH 30xx**

- 9.5 g

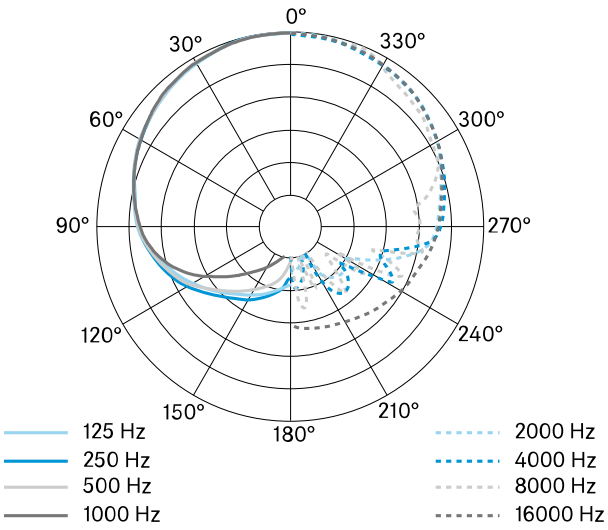
**Connection**

- Special coaxial connector

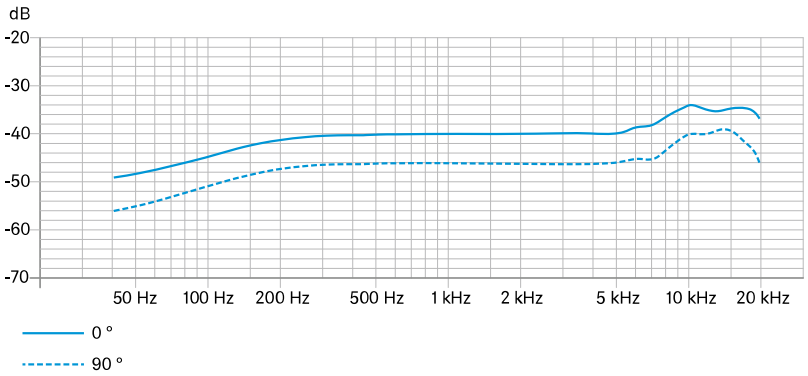
**Temperature**

- Operation: -10 °C to +50 °C (14 °F to 122 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## Polar diagram



## Frequency response



# ME 35

## Specifications

**Pick-up pattern**

- Super-cardioid

**Frequency response**

- 50 – 20,000 Hz

**Acoustic operating principle**

- pressure gradient transducer

**Sensitivity**

- 10 mV/Pa

**Electrical impedance**

- 50 Ω

**Min. terminating impedance**

- 1 kΩ

**Equivalent noise level**

- 37 dB (CCIR)
- 26 dB (A)

**Power supply via MZH 30xx**

- 12 V – 48 V phantom power (P 12 – P 48)

**Microphone power consumption**

- 250 µA

**Dimensions**

- Ø 12 x L18

**Weight without MZH 30xx**

- 9.5 g

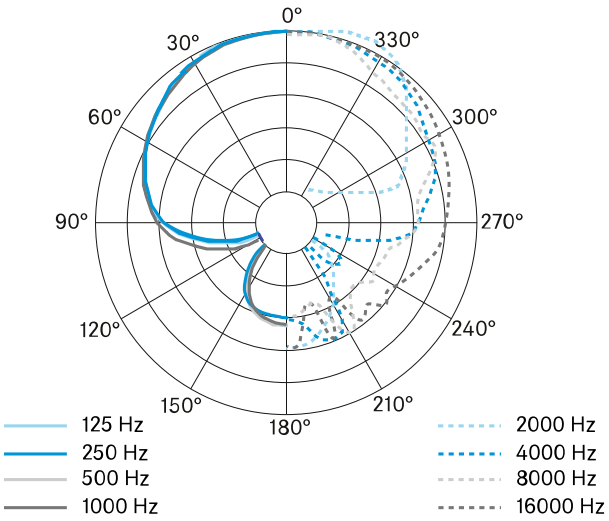
**Connection**

- Special coaxial connector

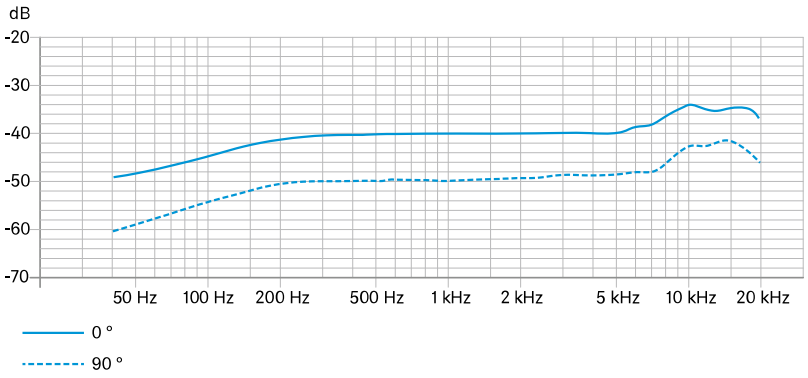
**Temperature**

- Operation: -10 °C to +50 °C (14 °F to 122 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## Polar diagram




## Frequency response



# ME 36

## Specifications

**Pick-up pattern**

- Supercardioid | lobar

**Frequency response**

- 40 – 20,000 Hz

**Acoustic operating principle**

- Pressure gradient transducer / interference tube

**Sensitivity**

- 18 mV/Pa

**Electrical impedance**

- 50 Ω

**Min. terminating impedance**

- 1 kΩ

**Equivalent noise level**

- 34 dB (CCIR)
- 23 dB (A)

**Power supply via MZH 30xx**

- 12 V – 48 V phantom power (P 12 – P 48)

**Microphone power consumption**

- 250 µA

**Dimensions**

- Ø 8.2 x L96

**Weight without MZH 30xx**

- 17 g

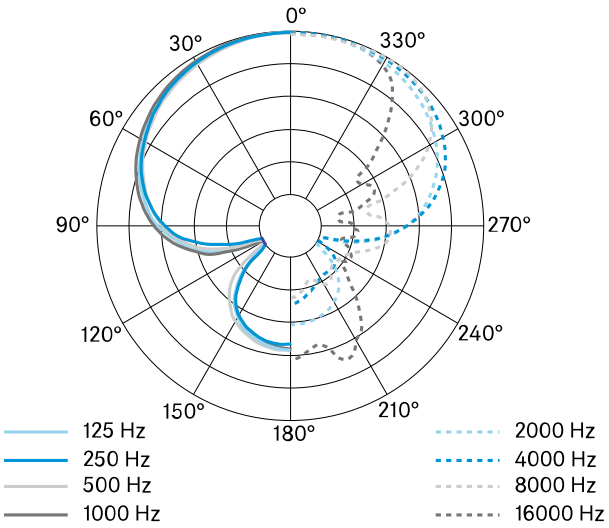
**Connection**

- Special coaxial connector

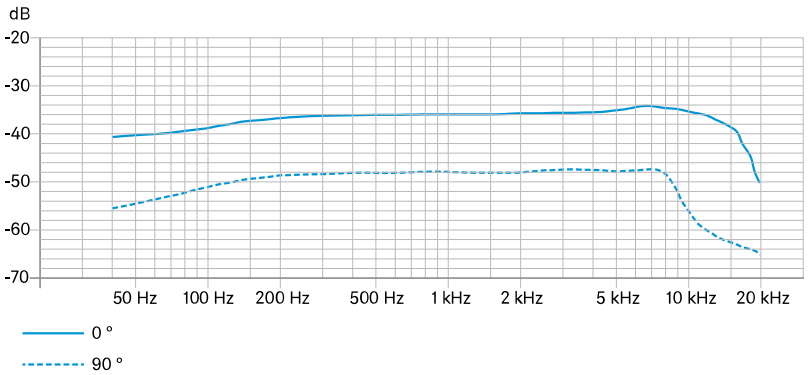
**Temperature**

- Operation: -10 °C to +50 °C (14 °F to 122 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## Polar diagram




## Frequency response



# MAS 133 switch box

## Specifications

### Power supply

- 48 V phantom power (P48) via MIC IN

### Current consumption

- 4.5 mA

### Microphone activation modes

- Toggle on/off
- Push To Mute (PTM)
- Push To Talk (PTT)
- Permanent on

### Logic output

- High-level output voltage > 2.4 V
- Low-level output voltage < 0.4 V

### Connection

- MIC IN: XLR-3F
- MIC OUT: XLR-3M
- SWITCH: XLR-5F
- 3x clip

### Weight

- Approx. 212 g

### Dimensions (W x H x D)

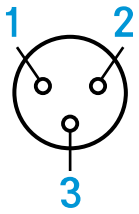
- Approx. 150 x 44 x 44 mm

### Temperature

- Operation: -10 °C to +50 °C (14 °F to 122 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## Connector assignment

### XLR-3 mic in

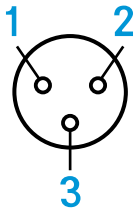



1 GND

2 Audio +

3 Audio -

### XLR-3 mic out

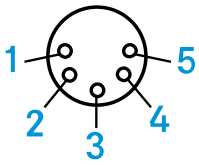



1 Audio -

2 Audio +

3 GND

### XLR-5 switch




1 GND

2 Switch

3 LED red

4 LED green

5 LEDs +12 V

# MAS 1

## Specifications

### Power supply

- 12 V (max. 1.5 mA)

### Current consumption

- Luminous ring: 3 mA

### Connection

- XLR-5M

### Weight

- Approx. 59 g

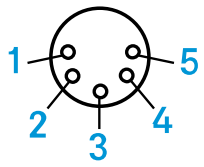
### Dimensions

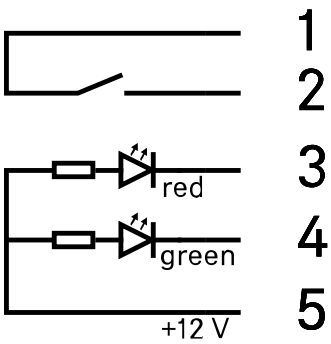
- Total height: approx. 81 mm
- Installation height: approx. 8 mm
- Button head diameter: approx. 29 mm
- Thread diameter: approx. 20 mm
- Rubber washer diameter: approx. 23 mm
- Thread: M20 x 1.5

### Temperature

- Operation: -10 °C to +50 °C (14 °F to 122 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

### Connector assignment




| | |
|---|---|
| 1 | Switch |
| 2 | Switch |
| 3 | red |
| 4 | green |
| 5 | LEDs +12 V |

# Table stands



## MAT 133

**Current consumption**

- 1.9 mA

**Connector**

- MIC IN: XLR-3F
- MIC OUT: XLR-3M

**Weight**

- Approx. 1210 g

**Dimensions (W x H x D)**

- 120 x 43 x 170 mm

**Temperature**

- Operation: -10 °C to +50 °C (14 °F to 122 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## MAT 133-S

**Current consumption**

- 3.7 mA

**Microphone activation modes**

- Toggle on/off
- Push To Mute (PTM)
- Push To Talk (PTT)
- Permanent on

**Logic input**

- High-level input voltage > 2.0 V
- Low-level input voltage > 0.8 V

**Logic output**

- High-level output voltage > 2.4 V
- Low-level output voltage> 0.4 V

**Connector**

- MIC IN: XLR-3F
- MIC OUT: XLR-3M
- 3 x clip

**Power supply**

- 48 V phantom power (P 48)

**Weight**

- Approx. 1210 g

**Dimensions (W x H x D)**

- 120 x 43 x 170 mm

**Temperature**

- Operation: -10 °C to +50 °C (14 °F to 122 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

## MAT 153-S

**Current consumption**

- 3.7 mA

**Microphone activation modes**

- Toggle on/off
- Push To Mute (PTM)
- Push To Talk (PTT)
- Permanent on

**Logic input**

- High-level input voltage > 2.0 V
- Low-level input voltage > 0.8 V

**Logic output**

- High-level output voltage > 2.4 V
- Low-level output voltage> 0.4 V

**Connector**

- MIC IN: XLR-5F
- MIC OUT: XLR-5M
- 3 x clip

**Power supply**

- 48 V phantom power (P 48)

**Weight**

- Approx. 1210 g

**Dimensions (W x H x D)**

- 120 x 43 x 170 mm

**Temperature**

- Operation: -10 °C to +50 °C (14 °F to 122 °F)
- Storage: -25 °C to +70 °C (-13 °F to 158 °F)

# Shock/installation mounts



## MZS 31

**Installation bore**

- 51 mm

**Installation depth**

- 50 mm

**Total length**

- 60 mm

**Flange diameter**

- 74 mm

## MZT 30

**Connector**

- XLR-3F

**Installation bore**

- 24 mm

**Installation depth**

- 27.5 mm

**Total length**

- 30 mm

**Flange diameter**

- 36 mm

## MZT 30-L

**Connector**

- XLR-3F

**Installation bore**

- 24 mm

**Installation depth**

- 36 mm

**Total length**

- 38.5 mm

**Flange diameter**

- 38.5 mm

# MZC 30

**Connector**

- XLR-3M | screw connector for ME 3x

**Power supply**

- 12 V – 48 V phantom power (P 12 – P 48)

**Weight**

- Approx. 70 g

**Length**

- 9 m

**Diameter**

- 1.1 mm

Sennheiser electronic SE & Co. KG | Am Labor 1 | 30900 Wedemark | Germany