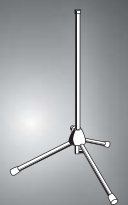
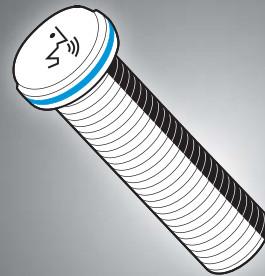
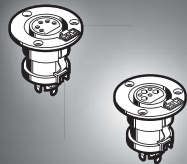
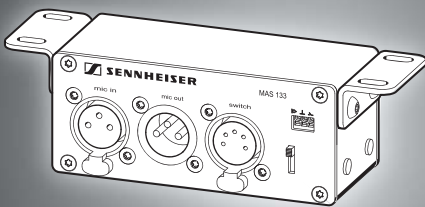


# SpeechLine IS microphone series

Microphone solutions for your  
conference | meeting room  
presentation



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## Important safety information



- ▶ Please read this instruction manual carefully and completely before using the products.
- ▶ Always include this instruction manual when passing the products on to third parties.
- ▶ Do not use obviously defective products.

### Preventing damage to health and accidents

- ▶ Position and install the products so that any risk of injury to the user is eliminated.
- ▶ Keep the products, accessories and packaging parts out of reach of children and pets to prevent accidents and choking hazards.

### Preventing damage to the product and malfunctions

- ▶ Always keep the products dry and do not expose it to extreme temperatures (hairdryer, heater, extended exposure to sunlight, etc.) to avoid corrosion or deformation.
- ▶ Only clean the products with a soft, dry cloth. Solvents or cleansing agents can damage the surfaces of the products.
- ▶ Only use the products within the specifications indicated (see page 35).
- ▶ Only use attachments/ accessories/ spare parts supplied or recommended by Sennheiser.
- ▶ Before operation, make sure that all connected third party devices are in a safe operating condition and function properly.

### Intended use/Liability

The products of the "IS microphone series" are designed for use in meeting rooms, conference rooms and auditoriums. Some of these products can be combined with each other.

The products can be used for commercial purposes.

It is considered improper use when the products are used for any application not named in the corresponding manuals.

Sennheiser does not accept liability for damage arising from abuse or misuse of the products and their attachments/accessories.

## Sennheiser SpeechLine – True to the word

The spoken word remains the most personal and powerful tool in communication. It enables us to convey and exchange messages, thoughts and opinions, as well as emotions. Therefore, when using technical devices like microphones, it is most important that no content is lost or misunderstood.



The best microphone is one you don't have to think about while speaking, because it fully captures your voice and picks up your words as precisely as you form them. Easy operation and clear speech intelligibility are perhaps most popularly embodied in the characteristically shaped Sennheiser ME 36, which can be seen on virtually every TV news program.

The qualities of these iconic microphones can also be found in all other microphones of the versatile Sennheiser SpeechLine series. These qualities are also built into any microphone of the versatile Sennheiser SpeechLine portfolio.

Wired or wireless, digital or analog, this comprehensive range of easy to integrate and unobtrusively designed microphones offer a solution for just about any situation, including yours.

In many applications, a speech microphone can help to increase the speech intelligibility or even make it possible in the first place (as in teleconferences). The following chapters describe the most common applications.

### Typical applications

#### A) Conferences (voice lift)



The larger the room, the more helpful is an audio system which enhances the speech intelligibility. Especially in large conference rooms, a speaker seated at one end is difficult to understand at the other end. Table or ceiling microphones can be used to pick up what the speaker says. The audio signal can then be spread evenly around the room using wall or ceiling loudspeakers. This application is also known as "voice lift", i.e. the speech is amplified in the room.

#### B) Teleconferences

If the participants of a conference are seated in different rooms, they have to be connected via telephone or remote conference circuit. As a telephone alone can only offer inadequate speech transmission for all participants in the room, table or ceiling microphones should be used in this case too. These are connected to a telephone conference unit such as the Sennheiser TeamConnect system. This processes the signals and establishes the connection to the remote participant.

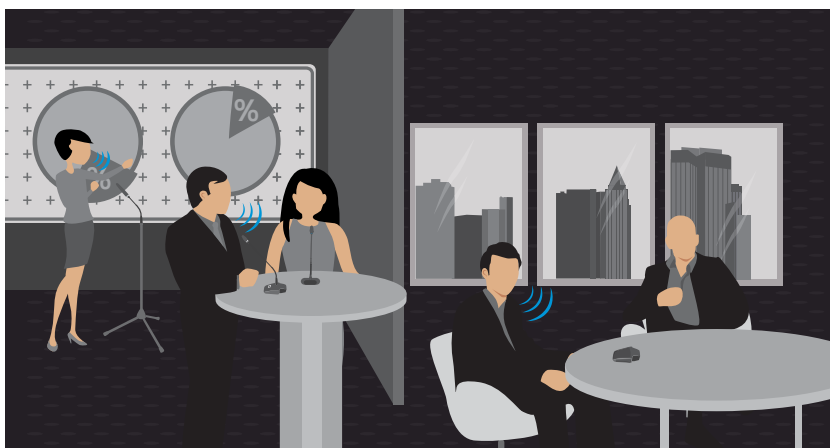
#### C) Presentations



Especially in a presentation, in which the focus is on the transmission of content, it is important to understand every word. Here, too, the larger the room, the more necessary it is to amplify the voice. In this case, gooseneck microphones offer the speaker orientation and enhance his presentation.

## Typical ways of setting up and installing microphones

Mobile microphones:



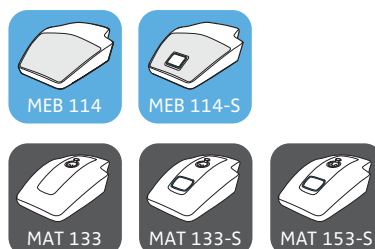
Permanently installed microphones:



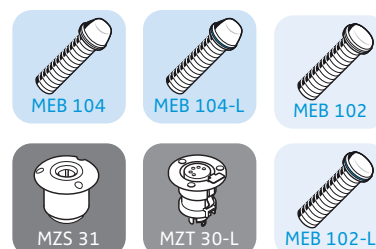
### A) Table

Especially in conference rooms, an obvious solution is miking up the table. Here all participants are seated around the table. Sennheiser offers mobile solutions as well as permanently installed microphones. The mobile microphones are simply placed on the table.

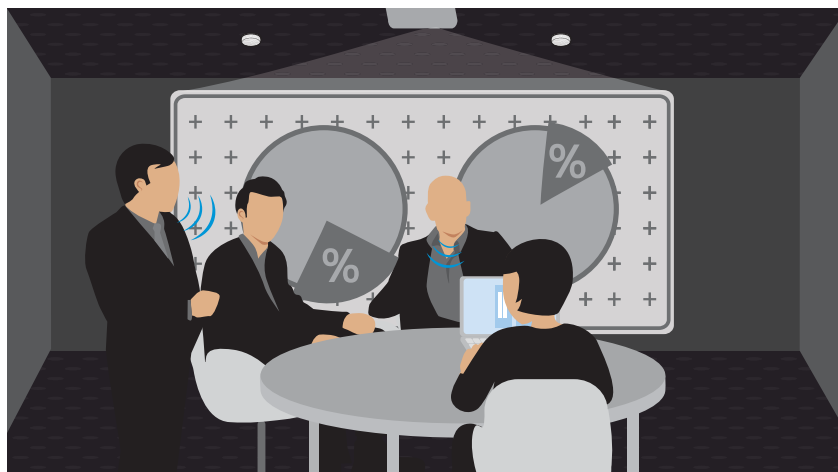
Mobile installation:



Permanent installation:



### B) Ceiling



Suspending a microphone from the ceiling is another alternative. It has the advantage that the microphones can be installed virtually invisibly in the room. Ceiling installation requires precise prior planning, as the microphones are further away from the speaker and the speech intelligibility can be impaired by noise coming from the ventilator of a projector or from an air conditioning unit.

### C) Lectern



A lectern is usually used for presentations. Here, too, the microphones can be positioned temporarily or installed permanently. A gooseneck microphone positions the microphone capsule close to the speaker, thus ensuring maximum speech intelligibility. Flexible gooseneck microphones prevent conflicts with laptops because they can be oriented flexibly.

### D) Floor

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

## Pick-up patterns of the microphones



### Omni-directional pick-up pattern

An omni-directional pattern picks up the sound uniformly from all directions.



### Cardioid pick-up pattern

A cardioid pattern has a wide directional characteristic, i.e. a wide opening angle. Sound hitting the rear of the microphone is attenuated very strongly.



### Super-cardioid pick-up pattern

A super-cardioid pattern has a slightly stronger directional characteristic than the cardioid pattern, so it suppresses noise coming from the side even more strongly but also picks up some of the sound coming from the rear.

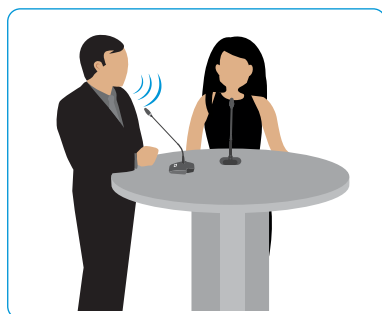


### Super-cardioid | lobar pick-up pattern

A super-cardioid or lobar pattern has the strongest directional characteristic, i.e. it provides the maximum suppression of sound coming from the side, but it also picks up sound coming from the rear. However, the ratio is lower than it is with the super-cardioid pattern.



## Positioning the microphones



### A) Distance from the speaker

Basically, 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 while offering excellent orientation.

Boundary layer microphones do not achieve the excellent acoustic characteristics of gooseneck microphones, but they can be positioned especially unobtrusively. These microphones can be integrated into any room due to their small size and the colors they are available in. As a result of the so-called boundary layer effect, the signal picked up by the microphone capsule is amplified on a surface (for example a table or a ceiling panel). In this way, part of the distance to the speaker can be compensated for again.

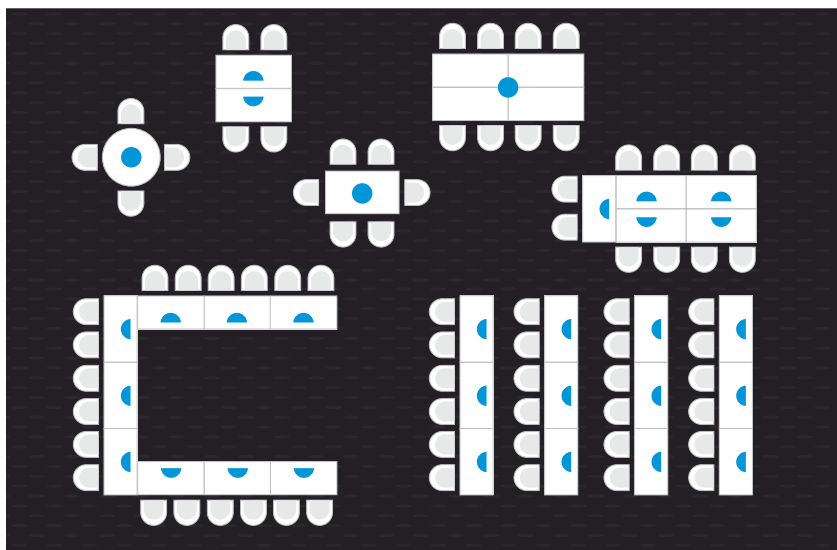
### B) One microphone for each speaker

In the ideal case, a dedicated microphone is used for each speaker. This allows the best possible orientation and distance to the speaker to be ensured at all times. It is also possible to choose a narrower directional characteristic. This allows noise coming from the side as well as acoustic reflections to be minimized, resulting in the highest speech intelligibility.

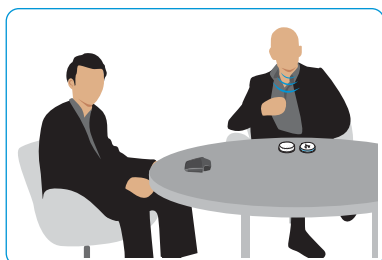
### C) "Shared microphones" - several speakers share one microphone

One microphone per speaker is ideal, but one microphone shared by two speakers is often adequate for many applications. A microphone with a sufficiently wide opening angle should be selected here. The microphone can thus pick up both speakers if installed centrally before them.

### D) Typical table shapes - U-shaped, round, long, rows

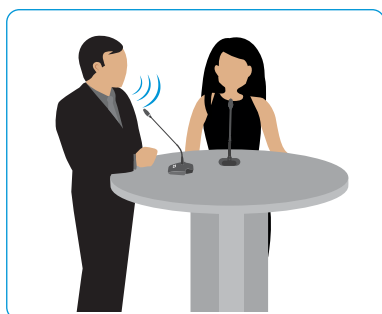


Depending on the configuration of the tables in a room, different microphones can be selected. In the case of a small round table, for example, a microphone with an omni-directional pick-up pattern (shown as a blue circle) is adequate to pick up all participants uniformly. Directional microphones (shown as a semicircle) are suitable for rows of tables. These microphones minimize the sound coming from the rear and the sides. In oblong conference rooms with long tables, a combination of directional and omni-directional microphones can be a good solution.



### E) Speaker is seated

For conferences in which the speakers are seated, planning is easy as the distance between the speaker and the microphone is easy to estimate or measure. Here, the microphone is simply placed on the table and oriented towards the speaker.



### F) Speaker is standing

In the case of presentations held at a lectern, the speaker is usually in a standing position. Here, the distance between lectern and mouth is virtually as large as it is with a seated speaker. In courtrooms, the speakers frequently stand up although the table in front of them is often of "normal" height. In this case, long gooseneck microphones should be used ideally in order to reduce the distance between the microphone capsule and the speaker.



## Typical acoustic situations

### A) Normally attenuated room

A normally attenuated room provides an average attenuation of reflections. This is contributed to by carpets, curtains or special acoustic ceilings. In the case of reduced reflections in the room, microphones pick up less noise, which results in the highest speech intelligibility.

### B) Room with amplified sound

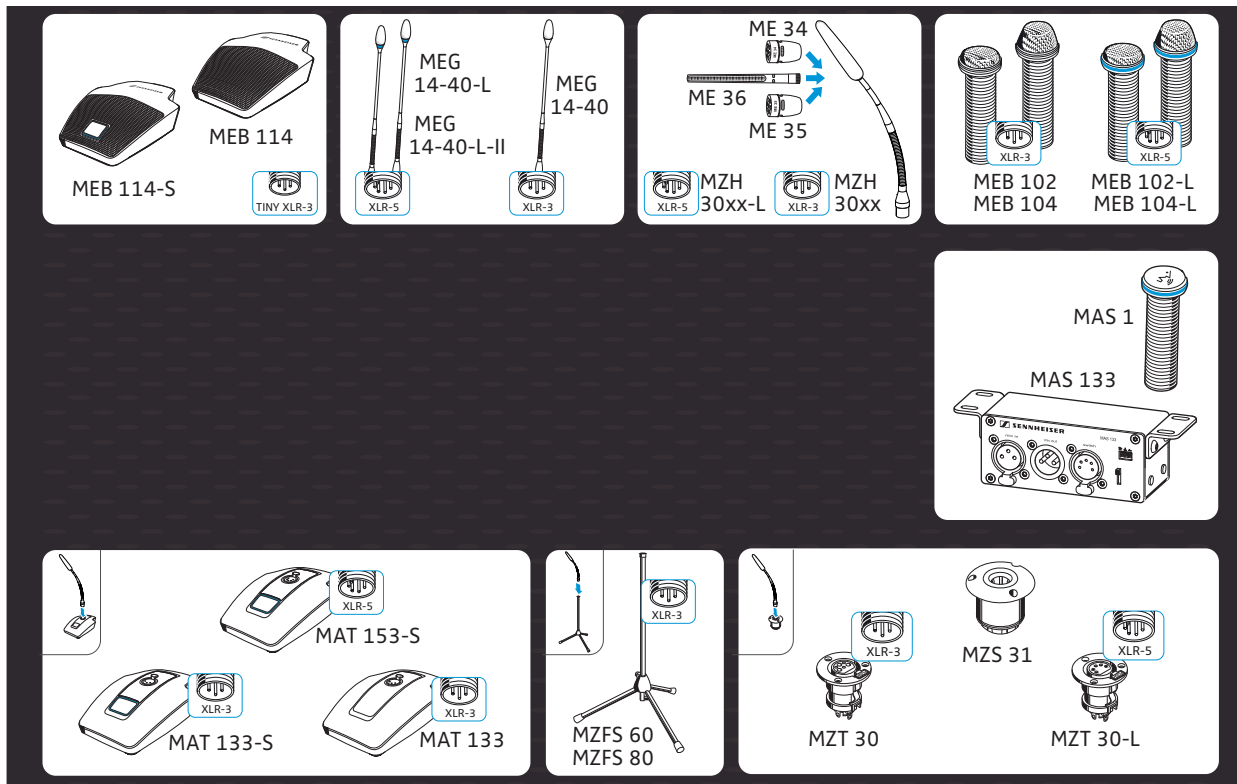
If the speech in the room is amplified by loudspeakers, this signal can enter the microphone again. This can cause echo, but in the worst case acoustic feedback can be the result. The effect can be reduced by using microphones with stronger directional characteristics.

### C) Large rooms with echo – acoustically challenging rooms

The larger the room, the more probable is acoustic disturbance due to reflections or sound coming from loudspeakers. If the room also has many smooth surfaces such as glass fronts or smooth floors, the result is a scenario which is extremely unfavorable acoustically. In this case, only microphones with strong directional characteristics like the ME 36 can ensure speech intelligibility.

# Overview of the SpeechLine IS microphone series

The SpeechLine IS microphone series offers microphones for different room and speech situations (with speakers in a standing or sitting position). Depending on the application, the microphones can be permanently mounted into tables or lecterns, mounted to the ceiling or simply set up somewhere.



The series comprise the following products:

Microphone with XLR-5 connection	Microphone with XLR-3 connection
Boundary layer microphones <b>signal light ring</b> : <ul style="list-style-type: none"> <li>• MEB 102-L</li> <li>• MEB 104-L</li> </ul>	Boundary layer microphones: <ul style="list-style-type: none"> <li>• MEB 114   with microphone button: MEB 114-S</li> <li>• MEB 102   MEB 104</li> </ul>
Gooseneck microphones with <b>signal light ring</b> : <ul style="list-style-type: none"> <li>• MZH 30xx-L goosenecks: MZH 3015-L, MZH 3040-L, MZH 3042-L, MZH 3062-L, MZH 3072-L with ME 34, ME 35 or ME 36 microphone head</li> <li>• MEG 14-40-L, MEG 14-40-L-II gooseneck microphones</li> </ul>	Gooseneck microphones: <ul style="list-style-type: none"> <li>• MZH 30xx goosenecks: MZH 3015, MZH 3040, MZH 3042, MZH 3062, MZH 3072 with ME 34, ME 35 or ME 36 microphone head</li> <li>• MEG 14-40 gooseneck microphone</li> </ul>
	MAS 133 inline switch box and MAS 1 microphone button for controlling a microphone
Table stands for gooseneck microphones: <ul style="list-style-type: none"> <li>• with microphone button: MAT 153-S</li> </ul>	Table stands for gooseneck microphones: <ul style="list-style-type: none"> <li>• MAT 133   with microphone button: MAT 133-S</li> </ul>
Table mounts for gooseneck microphones: <ul style="list-style-type: none"> <li>• MZS 31</li> <li>• MZT 30-L</li> </ul>	Table mounts for gooseneck microphones: <ul style="list-style-type: none"> <li>• MZS 31</li> <li>• MZT 30</li> </ul>
Floor stands for gooseneck microphones: <ul style="list-style-type: none"> <li>• MZFS 60 or MZFS 80</li> </ul>	

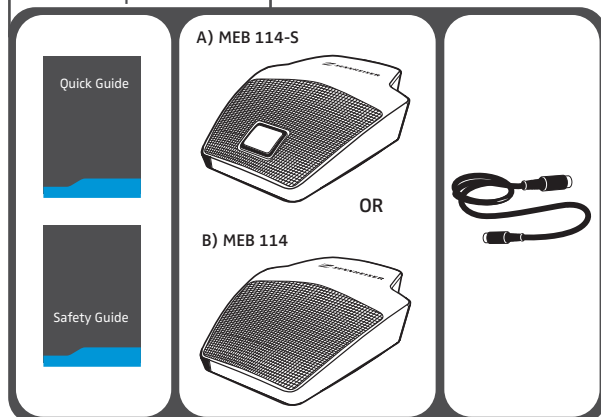
# Package contents

Depending on the product purchased, the package contents includes different components.

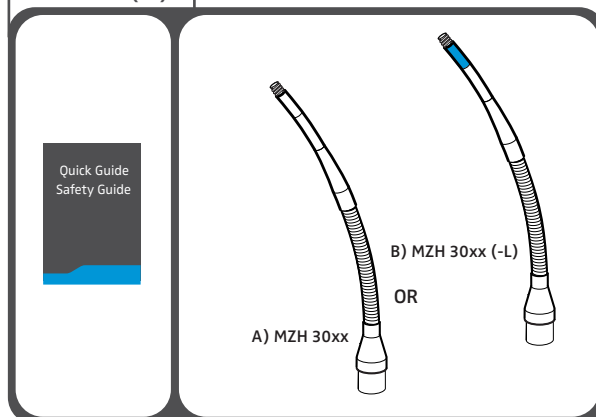
The letters A), B) etc. stand for alternative package components.

## Package contents of the microphones | microphone heads

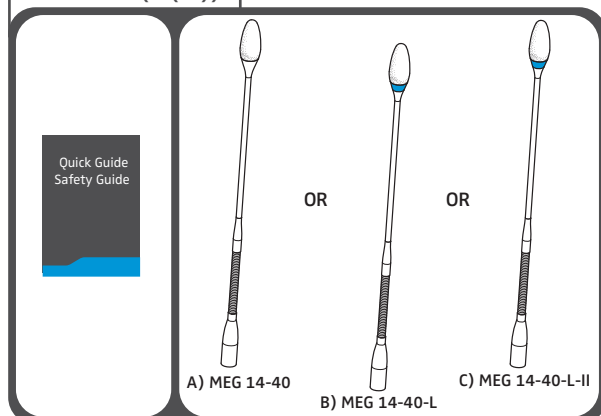
### MEB 114 | MEB 114-S



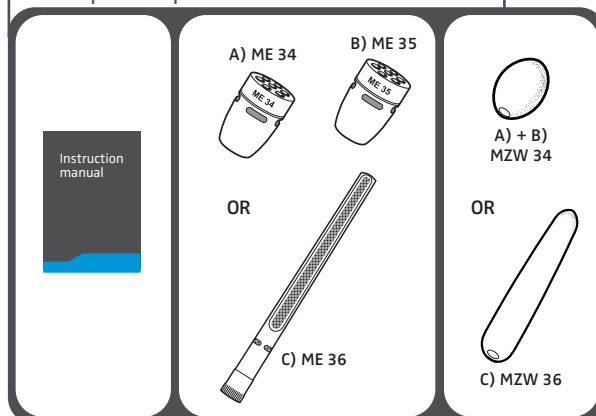
### MZH 30xx(-L)



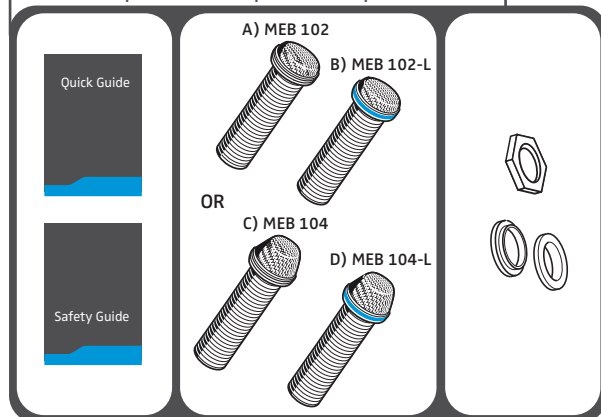
### MEG 14-40(-L-II)



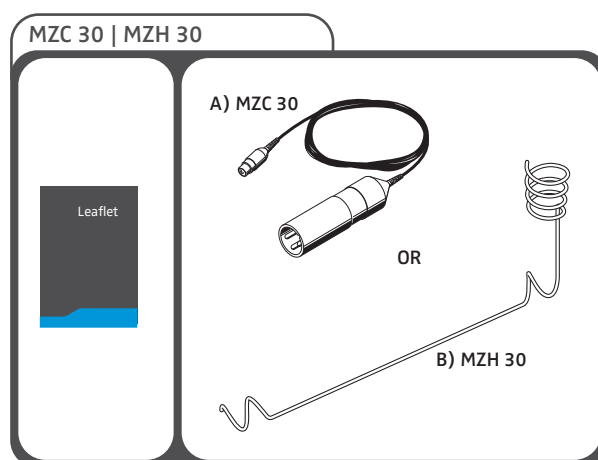
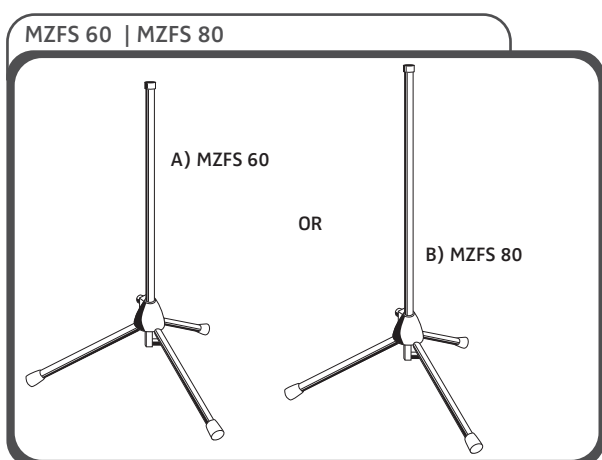
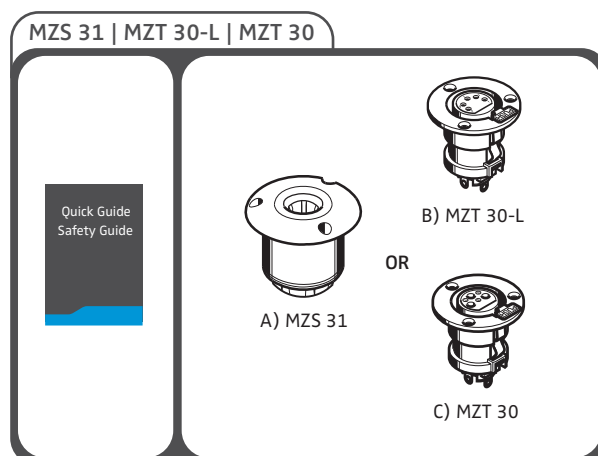
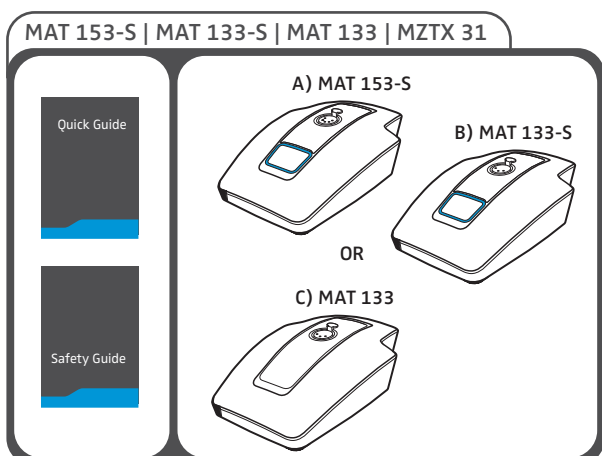
### ME 34 | ME 35 | ME 36



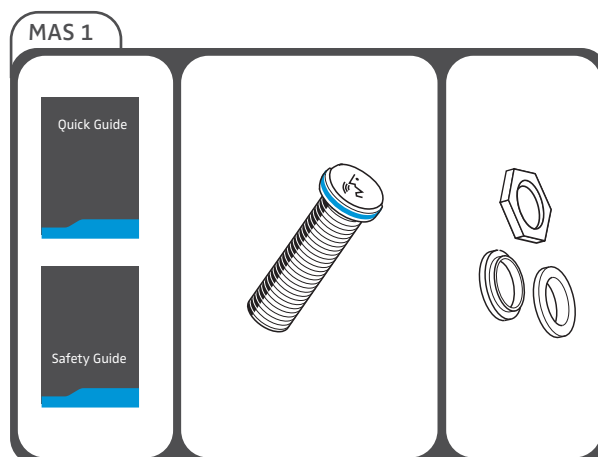
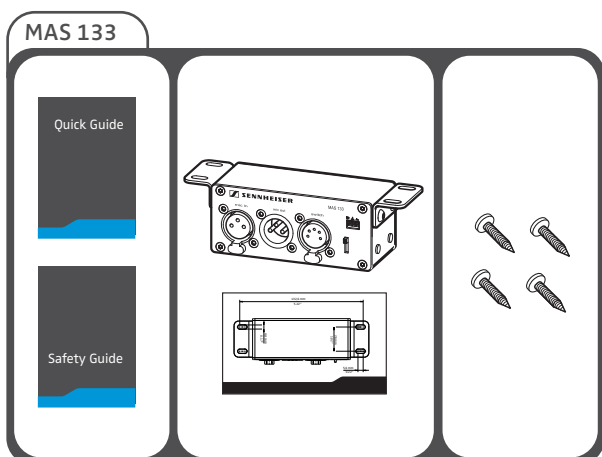
### MEB 102 | MEB 102-L | MEB 104 | MEB 104-L



## Package contents of the tables stands | floors stands | microphone mounts



## Package contents of the inline switch box | microphone button



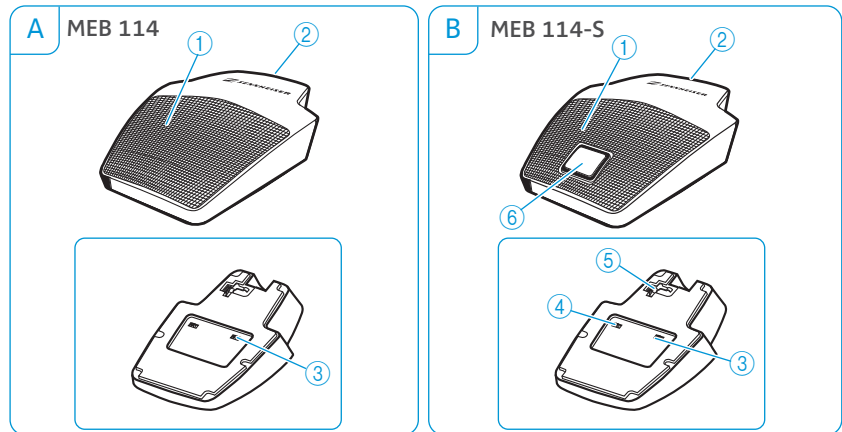
**i** For more information on the complete SpeechLine IS microphone series and for the data sheets of the individual components, please visit our website at [www.sennheiser.com](http://www.sennheiser.com).

For information on suppliers, contact your local Sennheiser partner:  
[www.sennheiser.com](http://www.sennheiser.com) > "Service & Support"

## Product overview

The pin assignment of the products can be found on page 40.

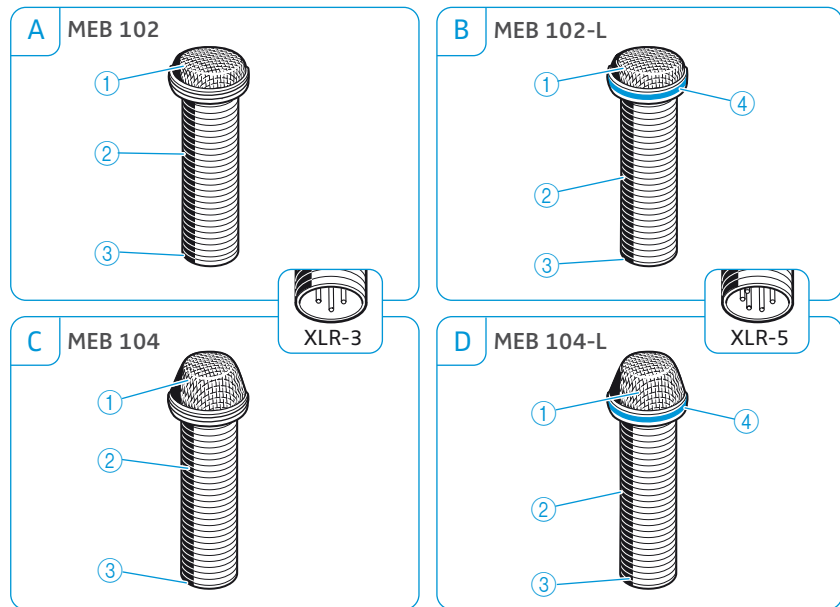
### Overview of the MEB 114 (-S) boundary layer microphones



- 1 Microphone
- 2 TINY-XLR-3 socket
- 3 Low cut filter

- 4 Slide switch for setting the behavior of the microphone button
- 5 Logic port
- 6 Microphone button with signal light ring (red/green)

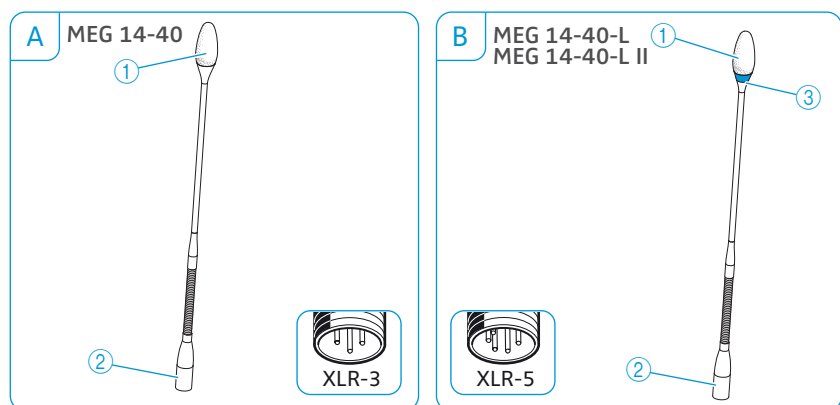
### Overview of the MEB 102 (-L) | MEB 104 (-L) surface-mounted boundary layer microphones



- 1 Microphone head
- 2 Threaded bolt
- 3 Connection socket, XLR
- 4 Signal light ring (red/green)

Variants	Features	
A MEB 102	omni-directional	
B MEB 102-L	omni-directional, with signal light ring	
C MEB 104	cardioid, acoustically directional	
D MEB 104-L	cardioid, acoustically directional, with signal light ring	

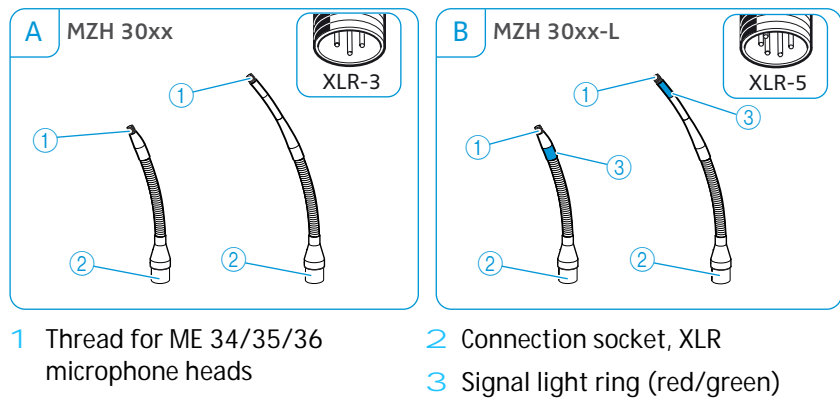
### Overview of the MEG 14-40 (-L(-II)) gooseneck microphones






- 1 Microphone head
- 2 Connection socket, XLR
- 3 Signal light ring
  - red: MEG 14-40-L
  - green: MEG 14-40-L II

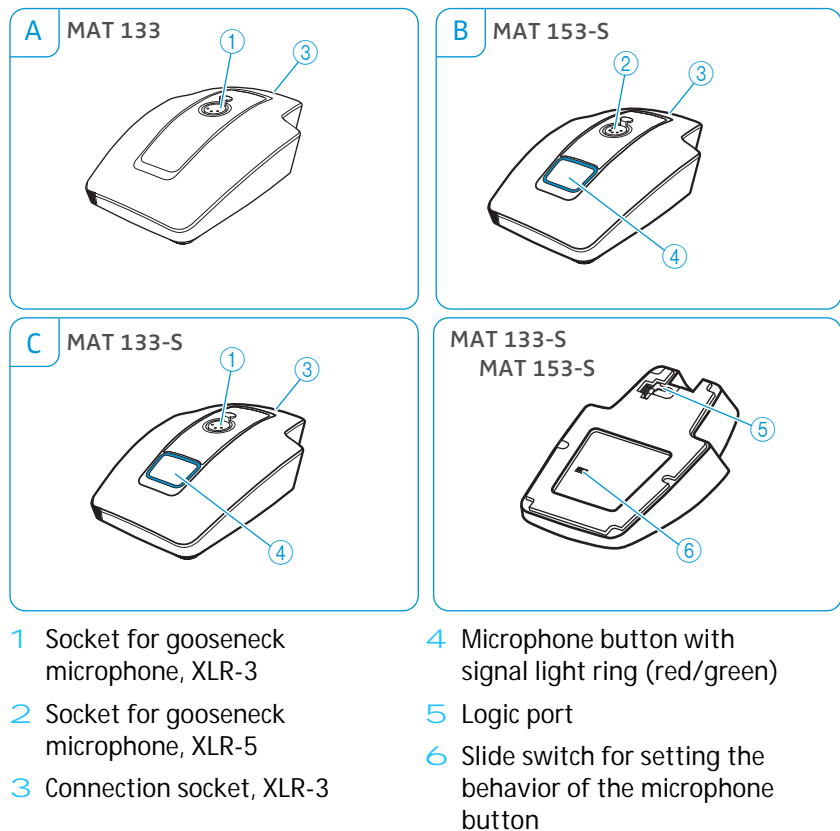
Variant	Features	
A MEG 14-40	cardioid, acoustically directional	
B MEG 14-40-L (-II)	cardioid, acoustically directional, with signal light ring	

## Overview of the MZH 30xx (-L) goosenecks

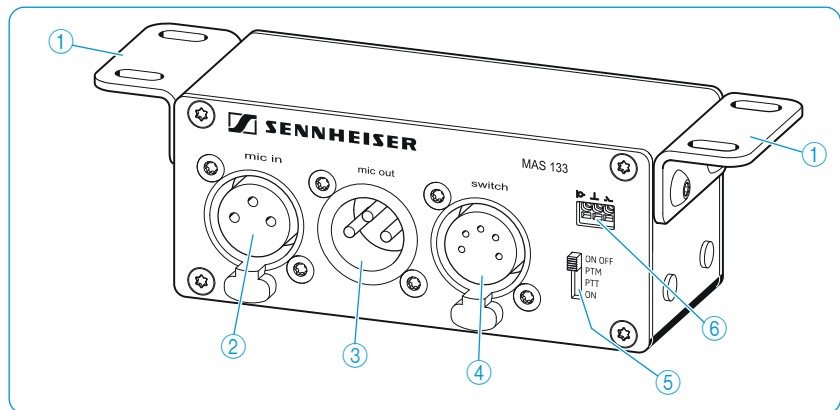


Microphone head	Features	
ME 34	cardioid, acoustically directional	
ME 35	super-cardioid, acoustically directional	
ME 36	super-cardioid/lobar, acoustically directional	

## Overview of the MAT 133 (-S) | MAT 153-S table stands

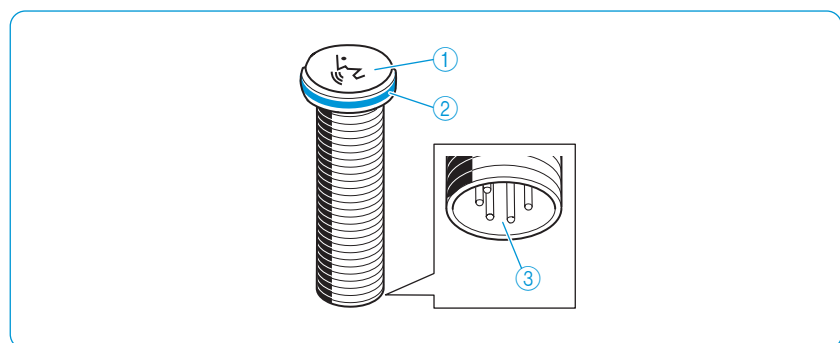


### Overview of the MAS 133 inline switch box



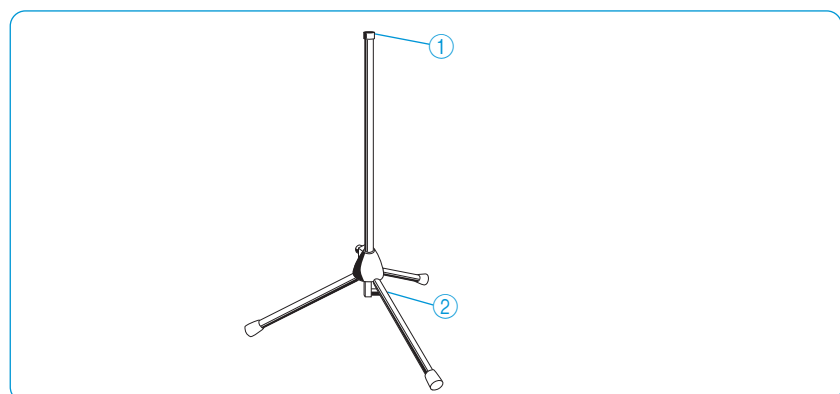
- 1 Mounting brackets
- 2 mic in microphone input, XLR-3F
- 3 mic out microphone output, XLR-3M
- 4 switch socket for MAS 1 microphone button, XLR-5F
- 5 Slide switch for setting the behavior of the microphone button
- 6 logic out output

### Overview of the MAS 1 microphone button



- 1 Microphone button
- 2 Signal light ring (red/green)
- 3 Socket for inline switch box, XLR-5M

### Overview of the MZFS 60 | MZFS 80 microphone stands



- 1 Microphone connection, XLR-3F
- 2 Connection socket, XLR-3M



# Mounting and installing the products

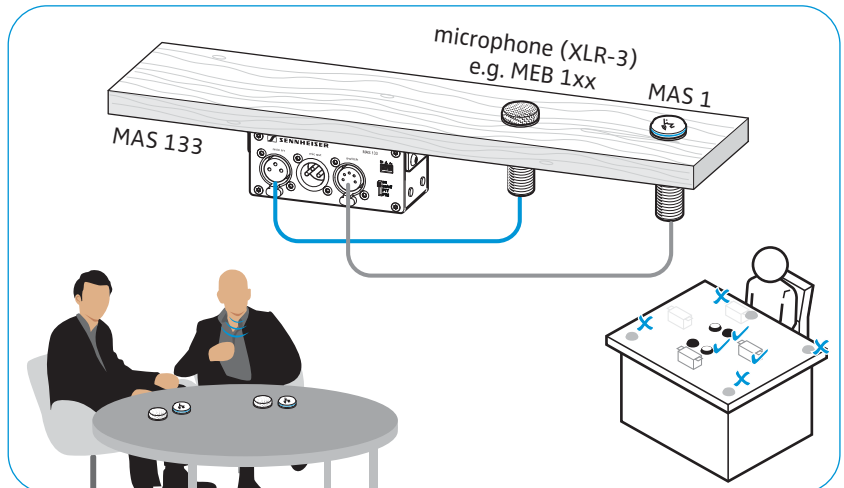
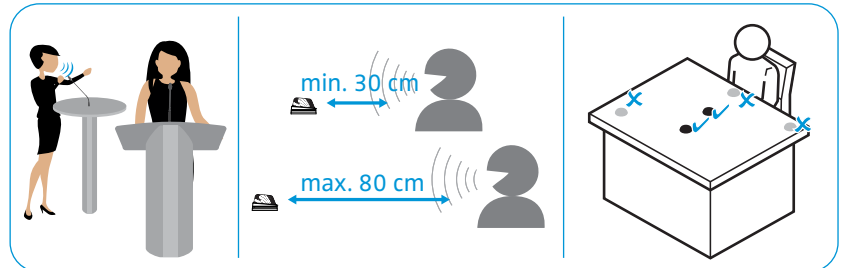
## Planning the position of surface-mounted products

Planning the position of surface-mounted microphones | microphone buttons | inline switch boxes on tables and lecterns

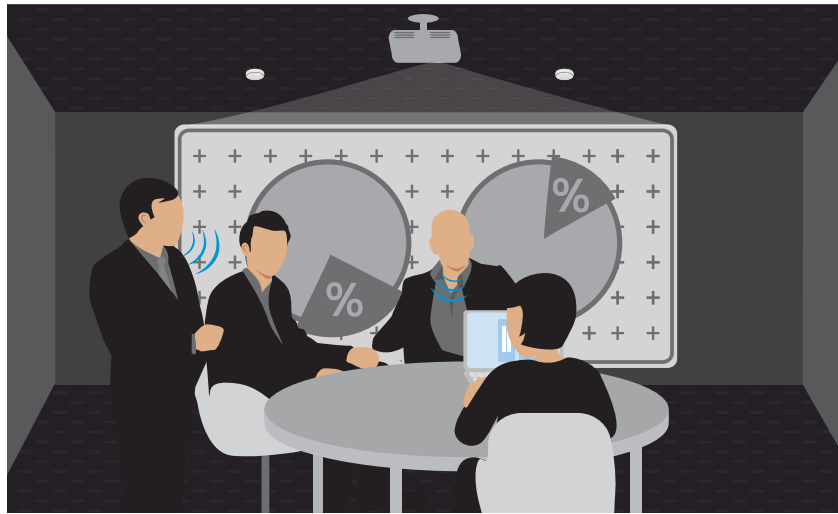


► Choose the positions of surface-mounted microphones, microphone buttons, table mounts, shock mounts and inline switch boxes on e.g. lecterns or conference tables so that

- the speakers don't hit their knees when sitting down,
- the distance between speaker and microphone is between 30 cm to 80 cm (best possible speech quality),
- the microphone buttons are easy to reach for the speakers and
- no disruptive objects, sources of disturbance (e.g. telephones or PC fans) or movable parts are in close proximity to the microphones.

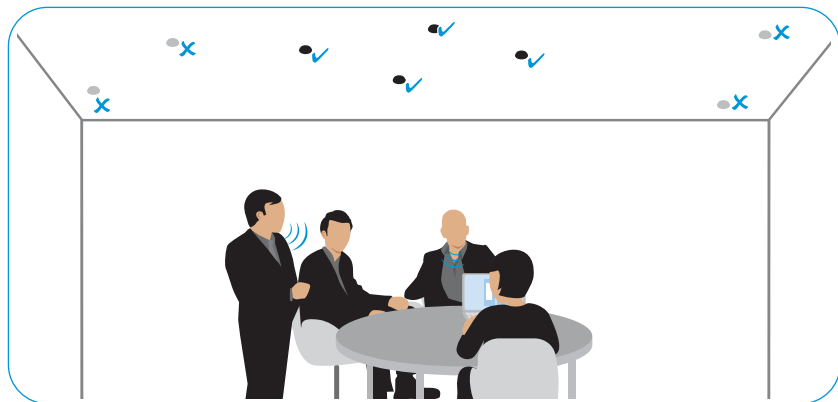


Planning the position of microphones | microphones accessories on a ceiling



To mount the product to a ceiling panel or wooden board:

- ▶ Choose the positions of the microphones or flush mounts on the ceiling so that
  - they are located directly above or in close proximity to the speaker,
  - neither the speaker nor other persons can hit their heads on the microphones or can get caught in hanging cables.
- ▶ When ceiling mounting, observe the applicable fire protection requirements for the building.

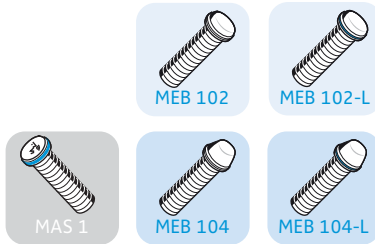
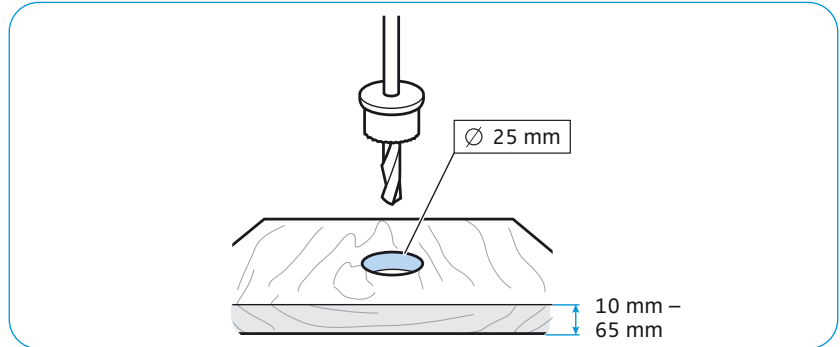


## Mounting surface-mounted boundary layer microphones, microphone buttons, switch boxes: table | lectern

### Drilling a hole through the surface of the table or lectern

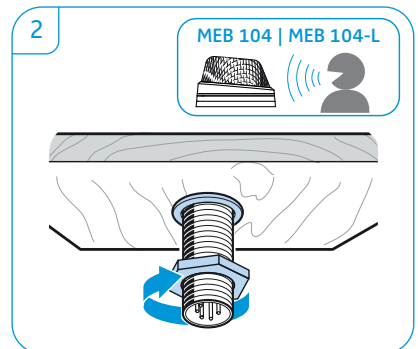
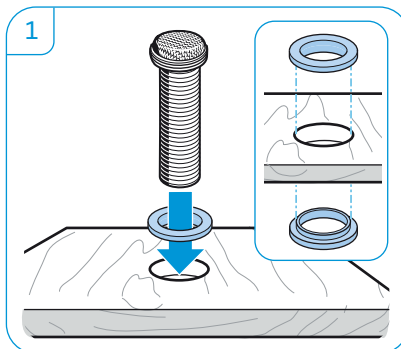
Once you have chosen a position for the product (see page 16):

- ▶ Drill a hole with a diameter of 25 mm through the mounting surface (plate thickness: 10 mm - 65 mm).



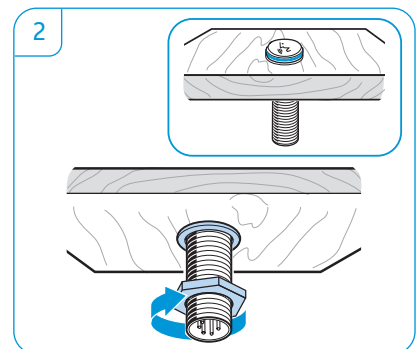
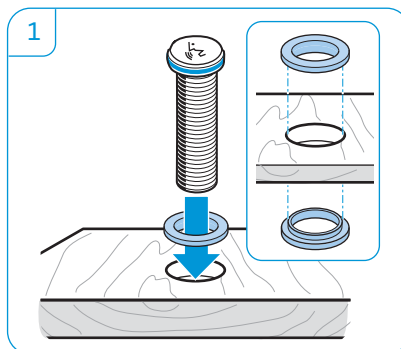
### Mounting the MEB 102 (-L) | MEB 104 (-L) boundary layer microphones

- 1 Slide the first rubber ring over the threaded bolt of the microphone and then insert the microphone into the drilled hole.
- 2 Orient the MEB 104 and MEB 104-L microphones towards the speaker. Slide the second rubber ring over the threaded bolt and tighten the hex nut.



### Mounting the MAS 1 microphone button

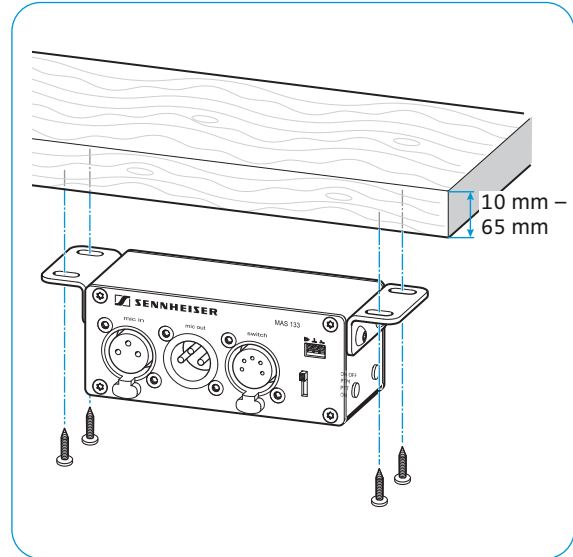
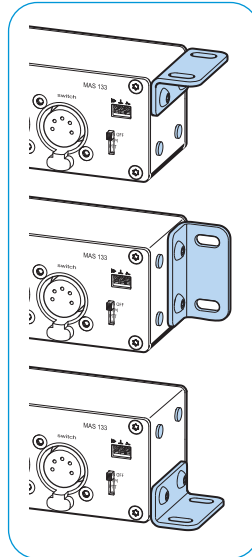
- 1 Slide the first rubber ring over the threaded bolt of the microphone button and then insert the microphone into the drilled hole.
- 2 Slide the second rubber ring over the threaded bolt and tighten the hex nut.



### Mounting the MAS 133 inline switch box



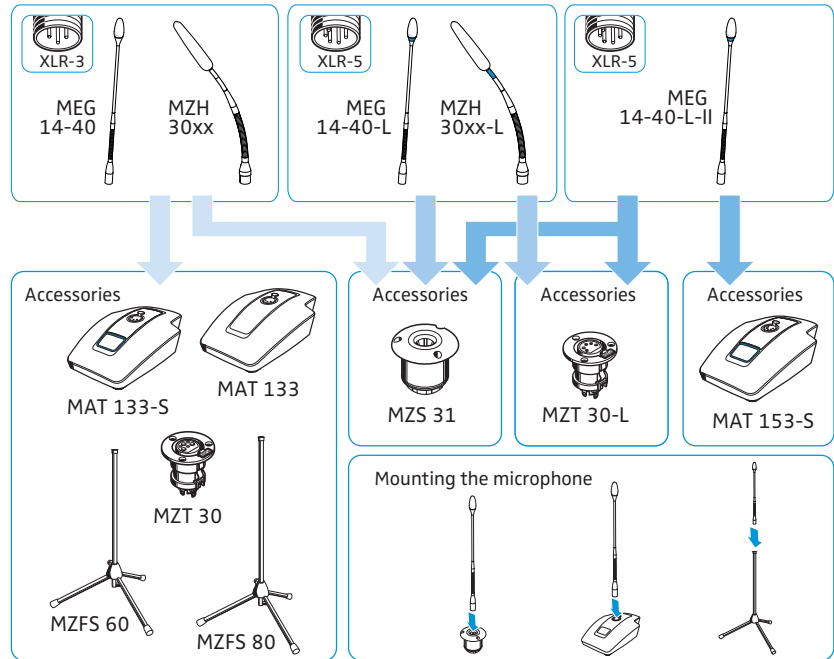
- ▶ If necessary, change the position of the mounting brackets by loosening the screws and removing the covers from the drilled holes. Attach the mounting brackets to the desired position and replace the covers.
- ▶ Use the drilling template (see supplement) to mark the position of the screws.
- ▶ Attach the inline switch box using the supplied recessed head screws.



## Mounting the gooseneck microphones: table | lectern | stand

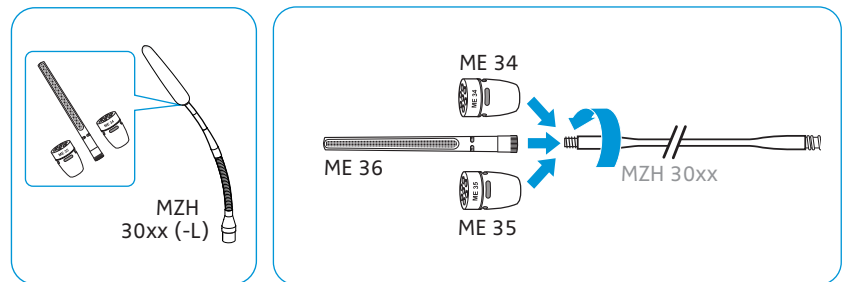
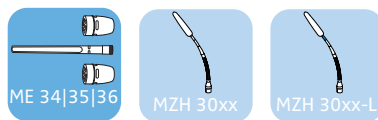
You can mount the gooseneck microphones:

- A) to mobile table stands,
- B) to floor stands and
- C) to surface-mounted table mounts or shock mounts.



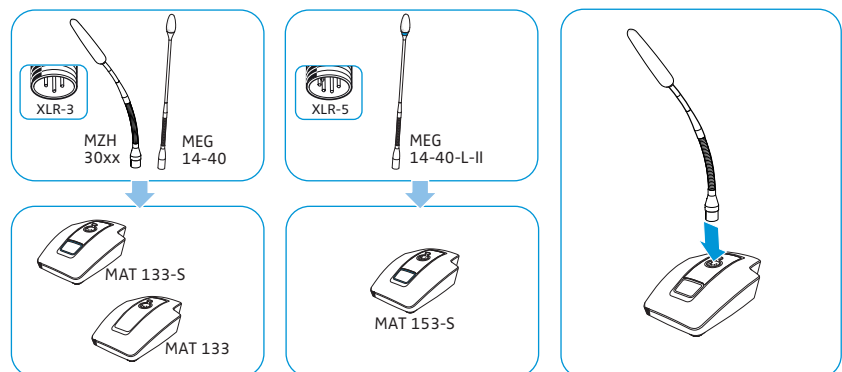
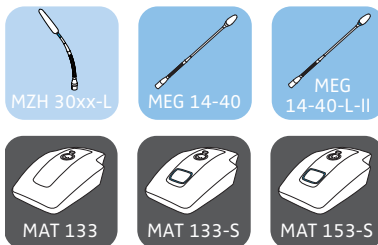
### Mounting the ME 3x microphone head onto the MZH gooseneck

- ▶ Tightly screw one of the microphone heads onto the gooseneck in order to ensure a reliable ground connection.

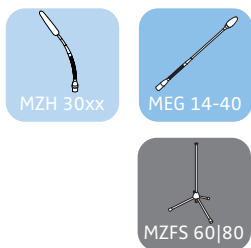


### A) Mounting the MEG/MZH gooseneck microphone onto the MAT table stand

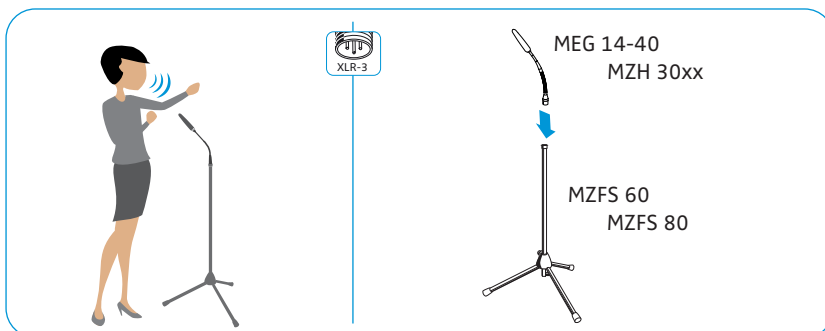
- ▶ Connect the XLR connector of the gooseneck microphone to the corresponding socket of the table stand.
- ▶ Orient the microphone towards the speaker.



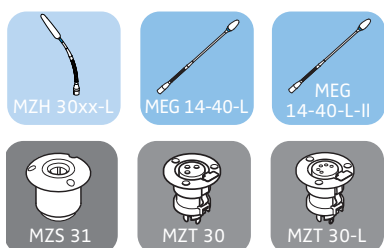
### B) Mounting the MEG/MZH gooseneck microphone to the MZFS floor stand



▶ Connect the XLR connector of the gooseneck microphone to the corresponding socket of the floor stand.

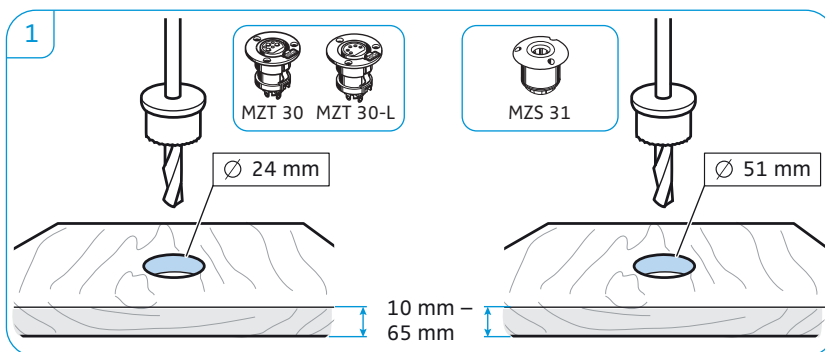


### C) Mounting the MEG/MZH gooseneck microphone to the MZT table mount/MZS shock mount

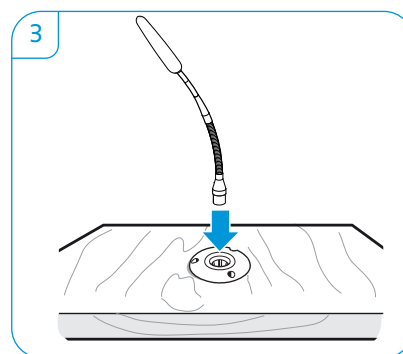
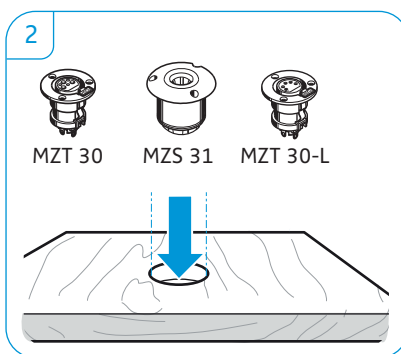


Once you have chosen a position for the product (see page 16):

- 1 Drill a hole with the following diameter through the mounting surface (plate thickness 10 mm - 65 mm):
  - 24 mm for the MZT 30 (-L) table mount
  - 51 mm for the MZS 31 shock mount



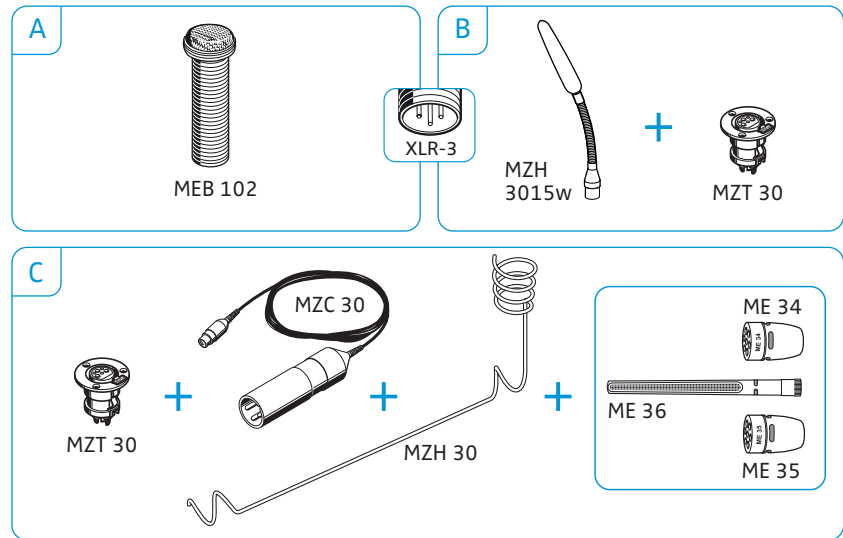
- 2 Insert the table mount or the shock mount into the drilled hole.
- 3 Connect the XLR connector of the gooseneck microphone to the corresponding socket of the MZT 30 (-L) table mount/MZS 31 shock mount.



## Mounting microphones to the ceiling



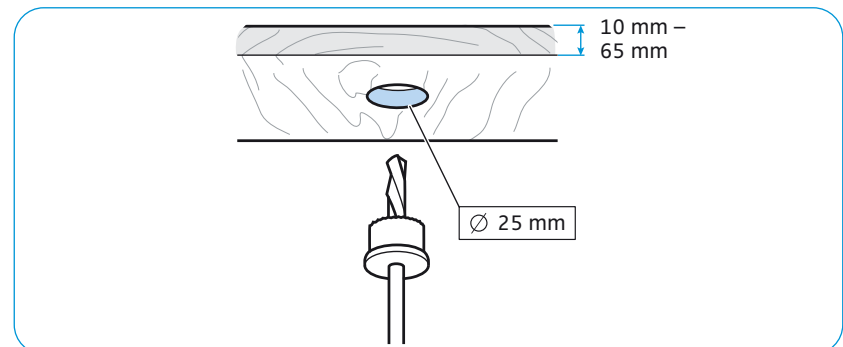
Some microphones of the IS series can also be mounted to a ceiling panel or wooden board of a suspended ceiling.



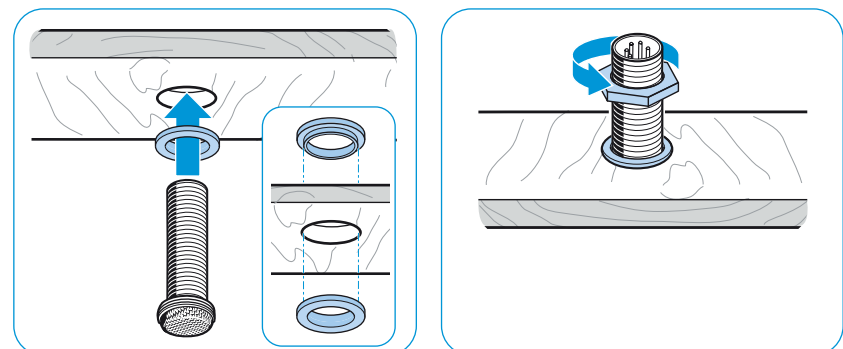
### A) Mounting the MEB 102 boundary layer to the ceiling

Once you have chosen a position for the product (see page 16):

- ▶ Drill a hole with a diameter of 25 mm through the ceiling panel or wooden board (plate thickness 10 mm - 65 mm).

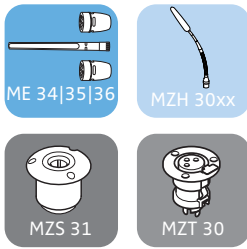


- ▶ Slide the first rubber ring over the threaded bolt of the microphone button and then insert the microphone into the drilled hole.
- ▶ Slide the second rubber ring over the threaded bolt and tighten the hex nut.

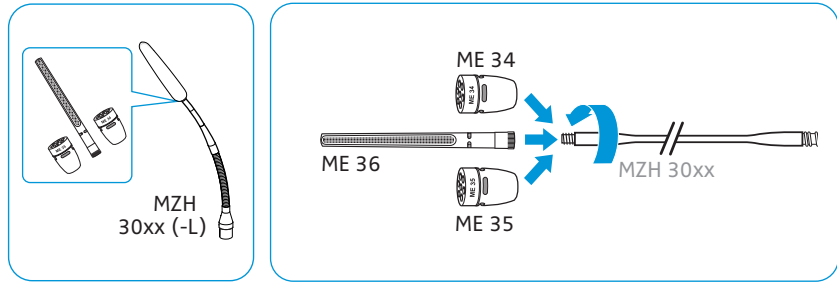


- ▶ Connect a suitable cable (see page 26) and lay the cable.

### B) Mounting the MZH 3015 w gooseneck microphone to the ceiling

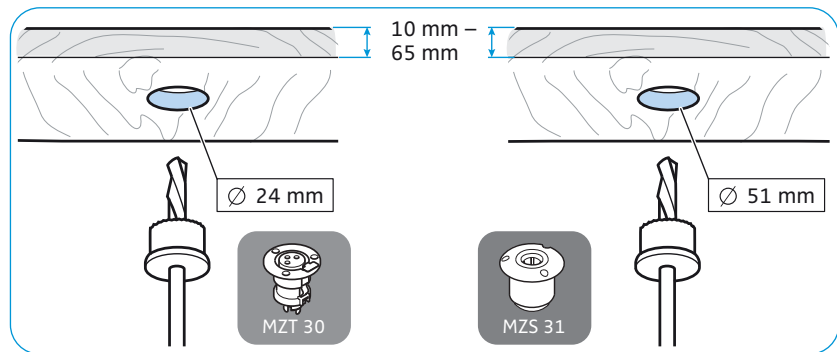


- ▶ Tightly screw one of the microphone heads onto the gooseneck in order to ensure a reliable ground connection.

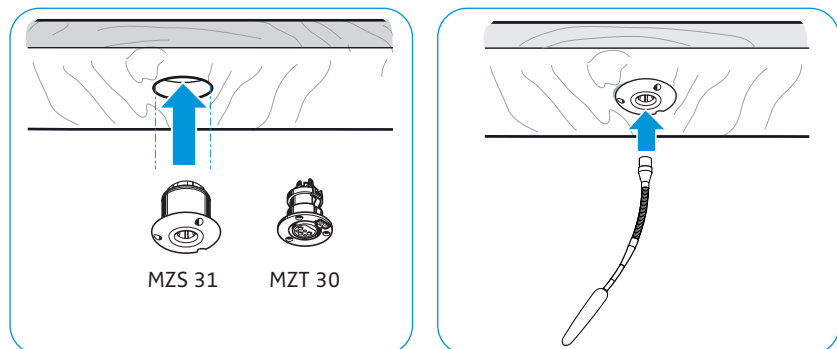


Once you have chosen a position for the product (see page 16):

- ▶ Drill a hole with the following diameter through the mounting surface (plate thickness 10 mm - 65 mm):
  - 24 mm for the MZT 30 table mount
  - 51 mm for the MZS 31 shock mount



- ▶ Insert the table mount or the shock mount into the drilled hole.
- ▶ Connect the XLR connector of the gooseneck microphone to the corresponding socket of the MZT 30 table mount/MZS 31 shock mount.

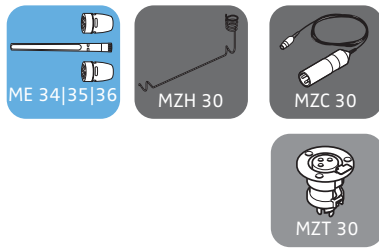


- ▶ Connect a suitable cable (see page 26) and lay the cable.

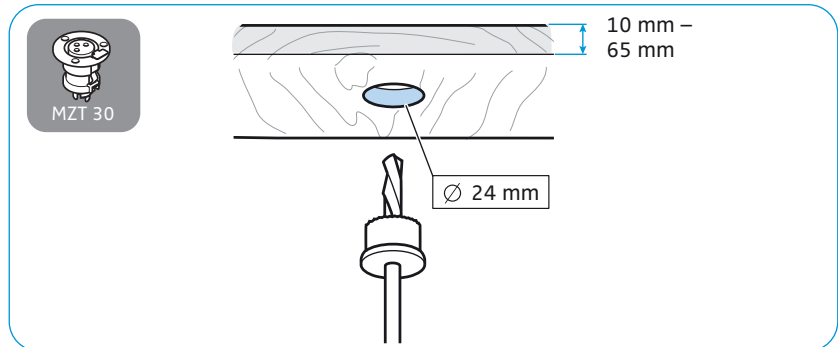


### C) Ceiling-mounting a ME 3x microphone

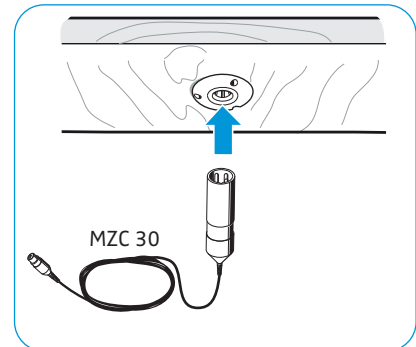
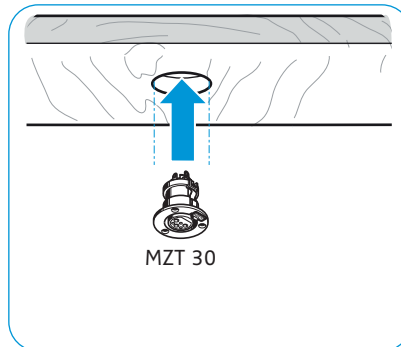
Once you have chosen a position for the product (see page 16):



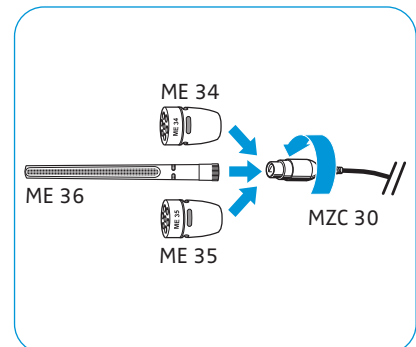
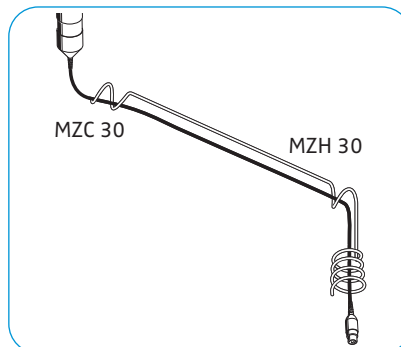
- ▶ Drill a hole with a diameter of 24 mm through the mounting surface (plate thickness 10 mm - 65 mm).



- ▶ Insert the table mount into the drilled hole.
- ▶ Connect the XLR connector of the MZC 30 cable to the corresponding socket of the MZT 30 table mount.



- ▶ Guide the cable through the MZH 30 metal ceiling hanger.
- ▶ Tightly screw one of the microphone heads onto the special coax socket of the cable in order to ensure a reliable ground connection.



- ▶ Connect a suitable cable (see page 26) and lay the cable.

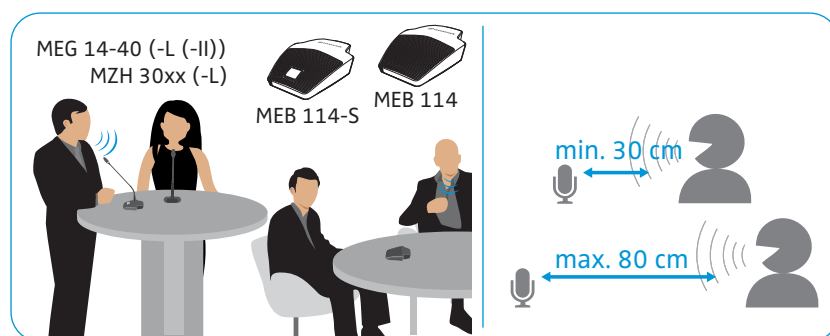
## Positioning mobile microphones



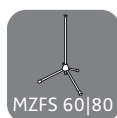
### Positioning tabletop boundary layer microphones/gooseneck microphones attached to a table stand



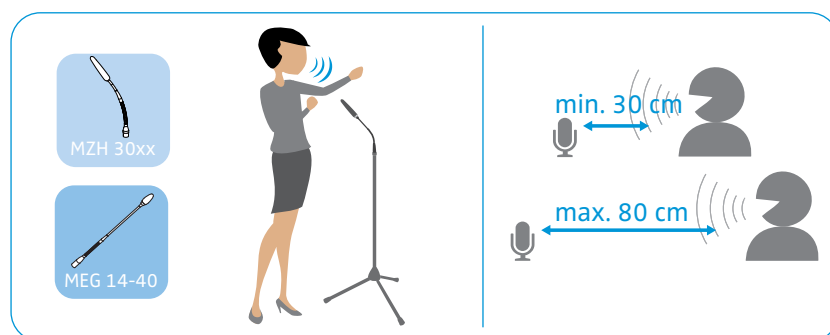
- ▶ Choose the positions of the microphone so that
  - the distance between speaker and microphone is between 30 cm to 80 cm (best possible speech quality) and
  - no disruptive objects, sources of disturbance (e.g. PC fans) or movable parts are in close proximity to the microphones.
- ▶ Orient the gooseneck microphones towards the speaker.



### Positioning gooseneck microphones attached to a stand



- ▶ Position the stand with the microphone so that the distance between speaker and microphone is between 30 cm to 80 cm (best possible speech quality).
- ▶ Orient the gooseneck microphones towards the speaker.



# Connecting the products

## Connecting the products to an audio input

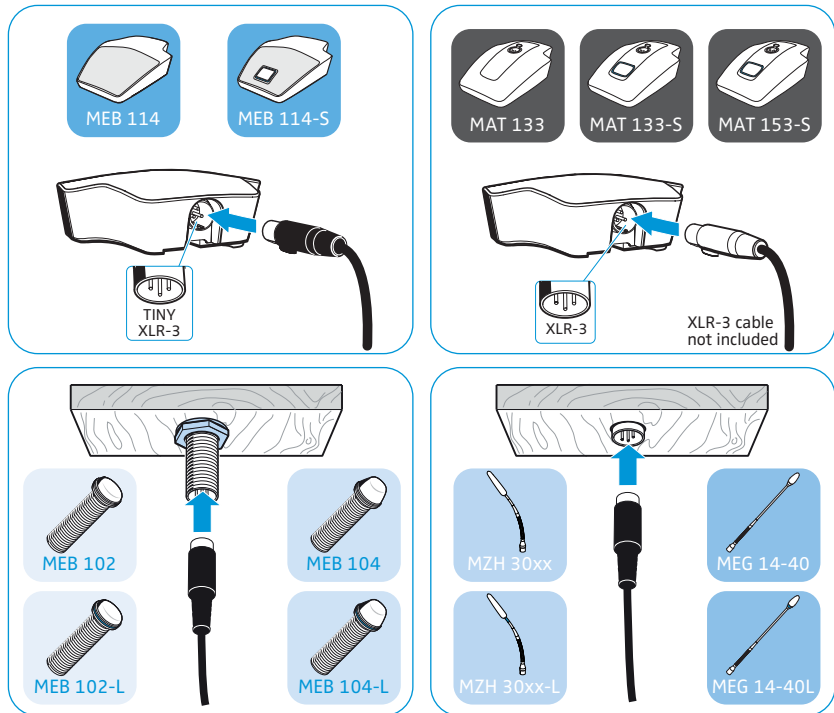


There are two ways to connect the products of the SpeechLine IS microphone series to a suitable audio input:

- A) Connection to a mixing console, an auto mixer or a digital signal processor (DSP) using shielded cables
- B) Connection to a mixing console via the MAS 133 inline switch box and the MAS 1 microphone button using shielded XLR cables

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

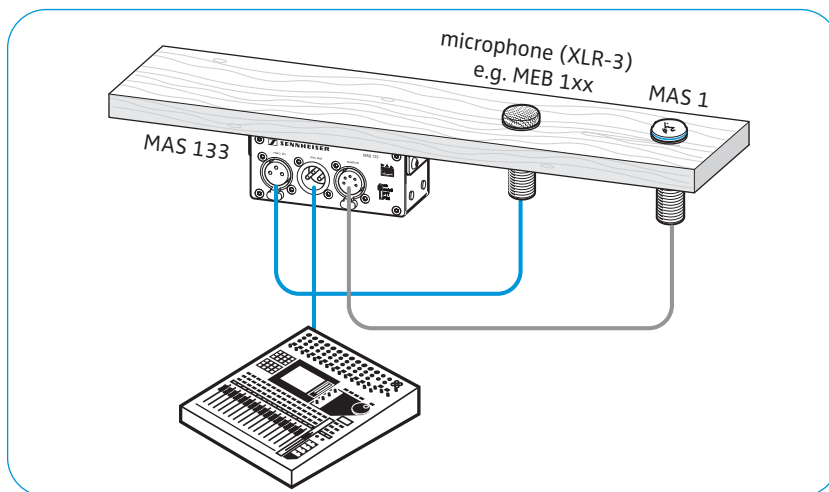
- ▶ Use a suitable shielded cable (e.g. XLR-XLR, XLR-terminal) to connect the microphone to the mixing console, the auto mixer or the DSP. For more information on the connections, refer to the instruction manual of your DSP.
- ▶ Lay all cables in such a way that other persons cannot trip over them and injure themselves.



B) Connecting a microphone | the MAS 133 inline switch box | the MAS 1 microphone button to a mixing console



- ▶ Use a shielded XLR-3 cable to connect the MAS 1 microphone button to the MAS 133 inline switch box (**switch** socket).
- ▶ Use a shielded XLR-3 cable each to connect the MAS 133 inline switch box to:
  - the microphone (MAS 133: **mic in** socket) and
  - the mixing console (MAS 133: **mic out** socket).



## Connecting products via the logic function



Once you have established the audio connection (see previous chapter), you can connect the products of the IS microphone series featuring a logic port (shown on the left) to the DSP.

The logic port passes on status information on the microphone button (microphone button pressed/not pressed) to the DSP. Via the logic output of the DSP, you can additionally control the status of the signal light ring of the microphone button.

The logic output also allows you to integrate and control several MAS 133 inline switch boxes in a system.

The following chapters provide

- A) information on how to connect the MAS 133 inline switch box to a DSP
- B) information on how to connect microphones
- C) an example installation for the Sennheiser TeamConnect system

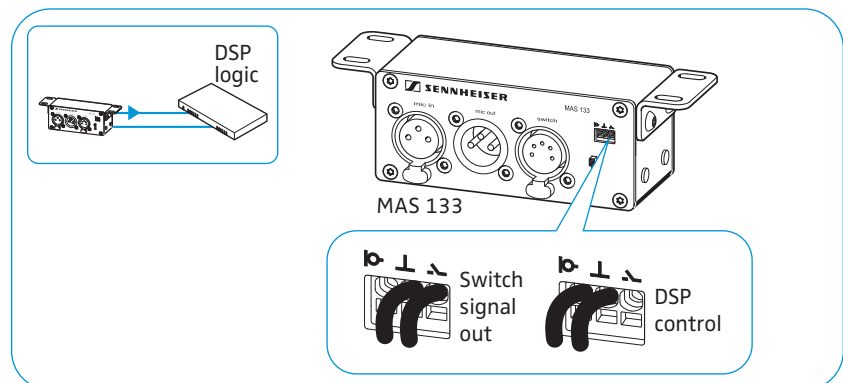
### A) Connecting the MAS 133 inline switch box to the DSP via the logic function



The way you connect the MAS 133 inline switch box determines which information is passed on to the DSP.

Logic port	Function
	Passes on status information on the microphone button – button pressed/not pressed – to the DSP.
	Passes on microphone status information – microphone activated/muted – to the DSP.

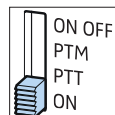
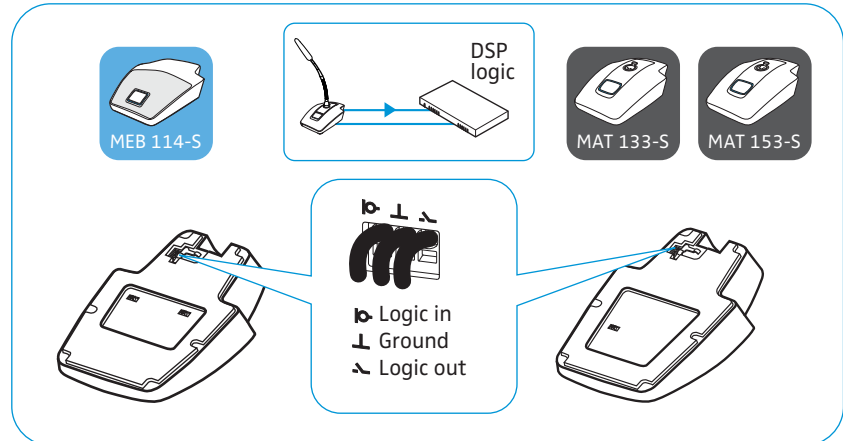
- ▶ Use a 2-wire cable (Ø 0.14–0.5 mm<sup>2</sup>) to connect the inline switch box to a GPIO port or logic port of the DSP.
- ▶ Lay all cables in such a way that other persons cannot trip over them and injure themselves.
- ▶ Observe the connection instructions in the instruction manual of your DSP.



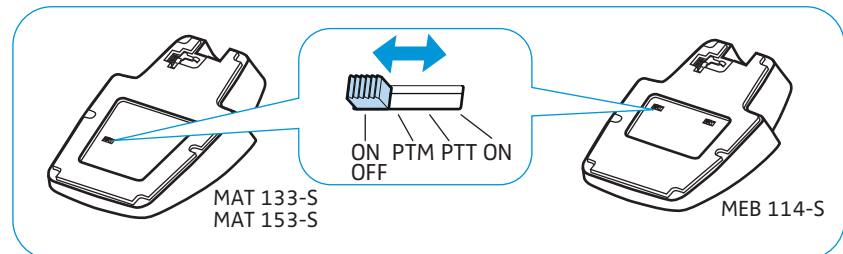
### B) Connecting microphones to a DSP with logic function

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

- ▶ Use a 3-wire cable (Ø 0.14–0.5 mm<sup>2</sup>) to connect the microphone or the table stand to a GPIO port or logic port of the DSP.
- ▶ Lay all cables in such a way that other persons cannot trip over them and injure themselves.
- ▶ Observe the connection instructions in the instruction manual of your DSP.

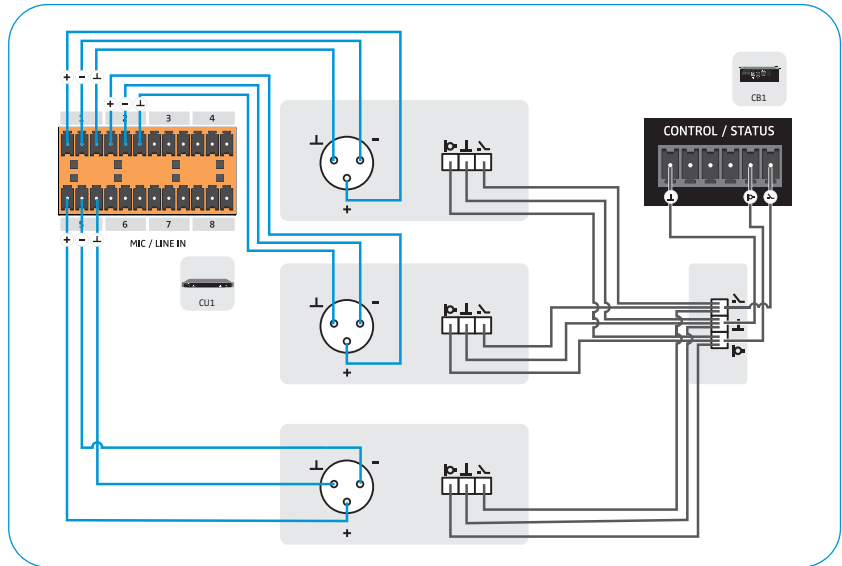
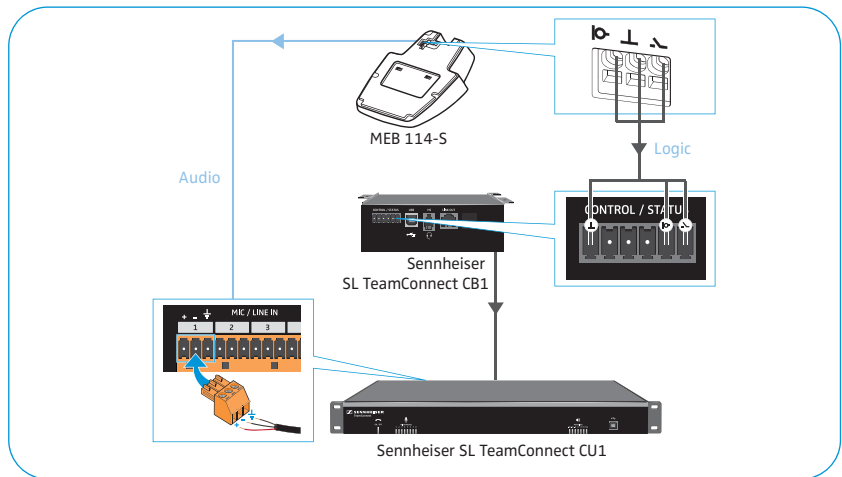
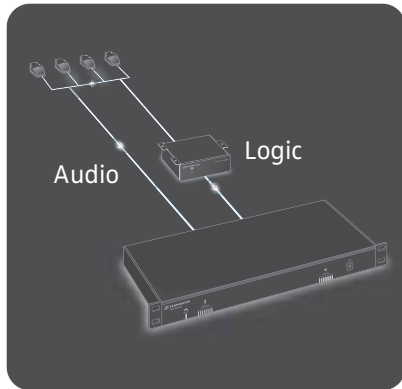


- ▶ Set the slide switch for setting the behavior of the microphone button to **ON** in order to activate the “DSP remote mode”. In “DSP remote mode”, the microphone is permanently on and is muted or activated via the DSP. The microphone thus permanently provides a reference signal for AEC algorithms in the DSP.

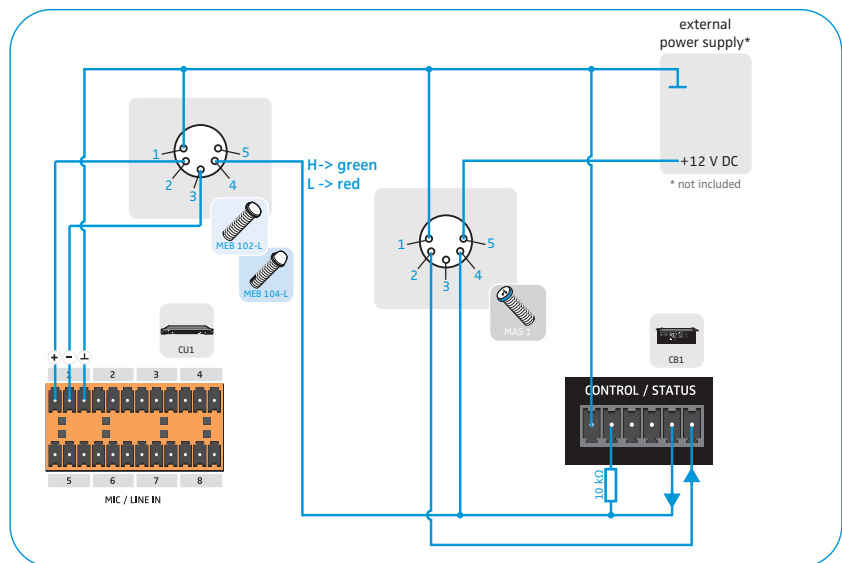


C) Example installation for the Sennheiser TeamConnect system

Example installation with an XLR-3 microphone



Example installation with an XLR-5 microphone and signal light rings



## Adjusting and using the products

### Adjusting the microphone sensitivity

- ▶ Use the mixing console, the auto mixer or the DSP to adjust the microphone sensitivity so that over- or under-modulation is avoided. For more information on the audio settings, refer to the instruction manual of the corresponding device.



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

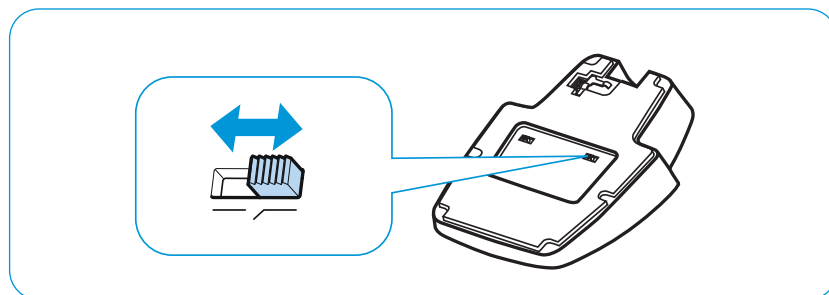
### Activating/deactivating the low-cut filter on the MEB 114 (-S)



A table or lectern transfers the sound produced when a speaker accidentally stumbles against it. The low-cut filter reduces low-frequency noise by filtering out frequencies below 120 Hz.

- ▶ Set the slide switch to the desired position:

	Low-cut filter is deactivated
	Low-cut filter is activated



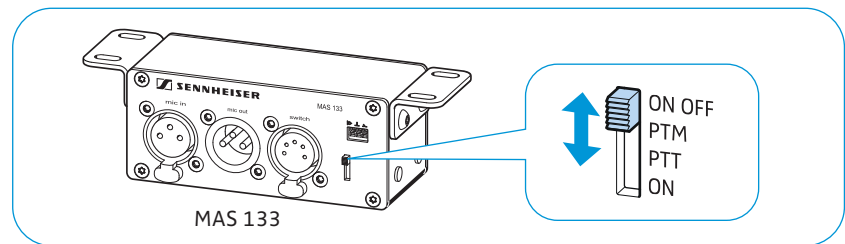
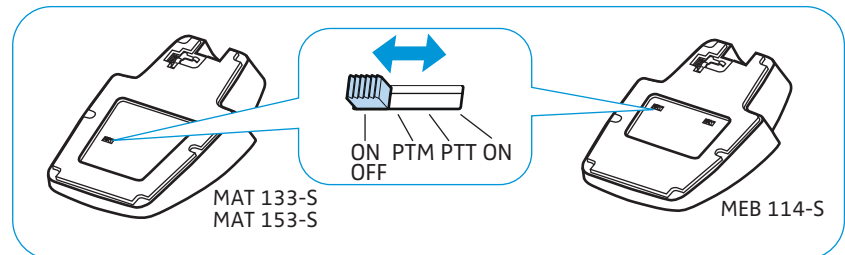


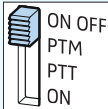
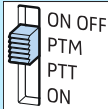
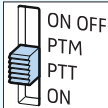
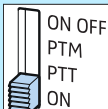
## Setting the behavior of the microphone button



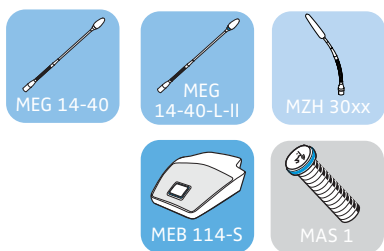
The products shown on the left feature a slide switch that allows you to directly set the behavior of the microphone button.

▶ Set the slide switch to the desired position.



Position	Function
	<p><b>ON/OFF:</b> When you press the microphone button, the microphone is:</p> <ul style="list-style-type: none"> <li>– activated (lights up green) or</li> <li>– muted (lights up red).</li> </ul>
	<p><b>PTM – Push To Mute:</b> The microphone is activated, the microphone button lights up green. The microphone button will light up red and the microphone will be muted for as long as you keep the microphone button pressed.</p>
	<p><b>PTT – Push To Talk:</b> The microphone is muted, the microphone button lights up red. The microphone button will light up green and the microphone will be activated for as long as you keep the microphone button pressed.</p>
	<p><b>ON:</b></p> <ul style="list-style-type: none"> <li>• <b>Protection against accidental operation:</b> The microphone is permanently activated. This setting prevents interruptions due to accidental operation of the microphone button.</li> <li>• <b>DSP remote mode:</b> The microphone is connected to a DSP via a logic port. In this case, the functions ON, OFF, PTT and PTM can be performed by the DSP.</li> </ul>

## Activating/muting microphones

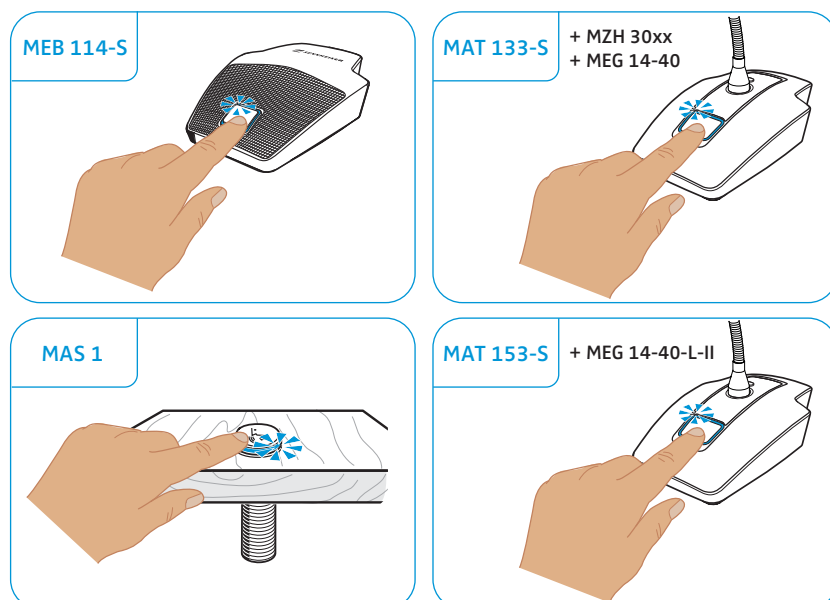


The products shown on the left have LEDs that indicate whether the microphone is muted or activated. The LEDs light up as soon as the products are powered via the mixing console, the auto mixer or the DSP.

Whether a microphone is permanently activated or muted or whether it can be activated or muted by pressing the microphone button depends on the setting of the slide switch that sets the behavior of the microphone button (see page 32). When the slide switch is set to **ON**, the microphone is permanently activated 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 DSPs.

**i** The signal light rings of the microphones light up synchronously with the signal light rings of the microphone buttons.

## Cleaning and maintaining the products

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### CAUTION

Liquids can damage the electronics of the products!

Liquids entering the housing of the product can short-circuit the electronics.

- ▶ Keep all liquids far away from the product.
  - ▶ Do not use any solvents or cleansing agents.
- 
- ▶ Clean the products with a soft, dry cloth.

# Specifications

## Product specifications



MEB 114



MEB 114-S

### Boundary layer microphones

- Pick-up pattern
- Frequency response
- Acoustic principle
- Switch for behavior of the microphone button
- Cut-off frequency
- Output impedance at 1kHz
- Sensitivity
- Max. sound pressure level
- Equivalent noise level  
A-weighted as per DIN IEC 61672
- Power supply
- Current consumption

	MEB 114	MEB 114-S
Pick-up pattern	cardioid	
Frequency response	40 – 20,000 Hz	
Acoustic principle	boundary layer microphone	
Switch for behavior of the microphone button	–	ON   PTM   PTT   ON/OFF
Cut-off frequency	120 Hz	
Output impedance at 1kHz	200 Ω	
Sensitivity	10 mV/Pa	
Max. sound pressure level	140 dB at 1 kHz	
Equivalent noise level A-weighted as per DIN IEC 61672	29 dB(A)	
Power supply	24 – 48 V phantom power (P 24 – P 48)	
Current consumption	1,5 mA	5.3 mA (microphone/signal light ring: 2.65 mA each)
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	tiny XLR-3M	tiny XLR-3M   3 x terminal
Weight	approx. 286 g	
Dimensions (W x H x D)	85 mm x 25 mm x 100 mm	
Temperature	operation: –10 °C (14 °F) to +50 °C (122°F) storage: –25 °C (–13°F) to +70 °C (158°F)	

Surface-mounted boundary layer microphones

Pick-up pattern  
 Frequency response  
 Acoustic principle  
 Output impedance at 1kHz  
 Sensitivity  
 Max. sound pressure level  
 Equivalent noise level  
 A-weighted as per DIN IEC 61672  
 Power supply  
 Current consumption



MEB 102



MEB 102-L



MEB 104



MEB 104-L

	MEB 102		MEB 102-L		MEB 104		MEB 104-L	
Pick-up pattern	omni-directional				cardioid			
Frequency response	40 – 20,000 Hz							
Acoustic principle	boundary layer microphone							
Output impedance at 1kHz	200 Ω							
Sensitivity	16 mV/Pa				14 mV/Pa			
Max. sound pressure level	125 dB at 1 kHz < 3%							
Equivalent noise level A-weighted as per DIN IEC 61672	21 dB (A)				28 dB (A)			
Power supply	24 – 48 V phantom power (P 24 – P 48)							
Current consumption	3 mA		6 mA (microphone/ signal light ring: 3 mA each)		3 mA		6 mA (microphone/ signal light ring: 3 mA each)	
Connector	XLR-3M		XLR-5M		XLR-3M		XLR-5M	
Weight	approx. 59 g				approx. 60 g			
Dimensions	installation height: approx. 12 mm				installation height: approx. 19 mm			
	total height: approx. 83 mm				total height: approx. 90 mm			
	Ø microphone head: approx. 29 mm							
	Ø threaded bolt: approx. 20 mm							
	thread size: M20 x 1.5							
Temperature	Ø rubber rings: approx. 23 mm							
	operation: –10 °C (14 °F) to +50 °C (122°F) storage: –25 °C (–13°F) to +70 °C (158°F)							



MZH 30xx



MZH 30xx-L

Gooseneck microphones

Pick-up pattern  
 Acoustic principle  
 Power supply  
 Current consumption

	MZH 30xx		MZH 30xx-L	
Pick-up pattern	depending on ME 3x mic head			
Acoustic principle	gooseneck microphone (condenser)			
Power supply	12 V – 48 V phantom power (P 12 – P 48)			
Current consumption	3 mA		18 mA (microphone/signal light ring: 9 mA each)	
Connector	XLR-3M		XLR-5M	
Temperature	operation: 0 °C (32 °F) to +40 °C (104 °F)			
	storage: –25 °C (–13°F) to +70 °C (158°F)			



**Gooseneck microphones**

Pick-up pattern  
 Frequency response  
 Acoustic principle  
 Output impedance at 1kHz  
 Sensitivity  
 Max. sound pressure level  
 Equivalent noise level  
 Power supply  
 Current consumption  
 Power supply signal light ring  
 Connector  
 Temperature

	MEG 14-40	MEG 14-40-L	MEG 14-40-L-II
Pick-up pattern	cardioid		
Frequency response	50 – 20,000 Hz		
Acoustic principle	gooseneck microphone (condenser)		
Output impedance at 1kHz	< 100 Ω		
Sensitivity	15 mV/Pa		
Max. sound pressure level	130 dB at 1 kHz < 3%		
Equivalent noise level	37 dB (CCIR) 26 dB (A)		
Power supply	12 V – 48 V phantom power (P 12 – P 48)		
Current consumption	3 mA		
Power supply signal light ring	–	9 – 30 V DC approx. 18 mA red	12 – 30 V DC 1 – 18 mA green
Connector	XLR-3M	XLR-5M	
Temperature	operation: 0 °C (32 °F) to +40 °C (104 °F) storage: –25 °C (–13°F) to +70 °C (158°F)		



**Microphone heads**

Pick-up pattern  
 Frequency response  
 Acoustic principle  
 Sensitivity  
 Electrical impedance  
 Min. terminating impedance  
 Equivalent noise level  
 Power supply via MZH 30xx  
 Current consumption microphone  
 Dimensions (W x H x D)  
 Weight without MZH 30xx  
 Connector  
 Temperature

	ME 34	ME 35	ME 36
Pick-up pattern	cardioid	super-cardioid	hyper-cardioid/lobar
Frequency response	40 – 20.000 Hz	50 – 20.000 Hz	40 – 20.000 Hz
Acoustic principle	pressure gradient transducer	pressure gradient transducer	pressure gradient transducer/ interference tube transducer
Sensitivity	10 mV/Pa		18 mV/Pa
Electrical impedance	50 Ω		
Min. terminating impedance	1 Ω		
Equivalent noise level	37 dB (CCIR) 26 dB (A)		34 dB (CCIR) 23 dB (A)
Power supply via MZH 30xx	12 V – 48 V phantom power (P 12 – P 48)		
Current consumption microphone	250 μA		
Dimensions (W x H x D)	Ø 12 x L18		Ø 8.2 x L96
Weight without MZH 30xx	9.5 g		17 g
Connector	special coax connector		
Temperature	operation: –10 °C (14 °F) to +50 °C (122°F) storage: –25 °C (–13°F) to +70 °C (158°F)		

### MAS 133 inline switch box



Power supply	48 V phantom power (P48) via <a href="#">MIC IN</a>
Slide switch for setting the behavior of the microphone button	ON   PTM   PTT   ON/OFF
Logic output	high level output voltage > 2.4 V   low level output voltage < 0.4 V
Connections	<a href="#">MIC IN</a> : XLR-3F   <a href="#">MIC OUT</a> : XLR-3M   <a href="#">SWITCH</a> : XLR-5F   3x terminal
Weight	approx. 212 g
Dimensions (W x H x D)	approx. 150 x 44 x 44 mm
Temperature	operation: -10 °C (14 °F) to +50 °C (122°F) storage: -25 °C (-13°F) to +70 °C (158°F)

### MAS 1 microphone button



Power supply	12 V (max. 1.5 mA)
Current consumption	signal light ring: 3 mA
Connection	XLR-5M
Weight	approx. 59 g
Dimensions	total height: approx. 81 mm installation height: approx. 8 mm Ø-head of microphone button: approx. 29 mm Ø-threaded bolt: approx. 20 mm Ø-rubber rings: approx. 23 mm thread size: M20 x 1.5
Temperature	operation: -10 °C (14 °F) to +50 °C (122°F) storage: -25 °C (-13°F) to +70 °C (158°F)



**Table stands**

	MAT 133	MAT 133-S	MAT 153-S
Current consumption	1.9 mA	3.7 mA	
Slide switch for setting the behavior of the microphone button	–	ON   PTM   PTT   ON/OFF	
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	MIC IN: XLR-3F MIC OUT: XLR-3M 3 x terminal	MIC IN: XLR-5F MIC OUT: XLR-3M 3 x terminal
Power supply	48 V phantom power (P 48)		
Weight	approx. 1200 g	approx. 1206 g	
Dimensions (W x H x D)	120 mm x 43 mm x 170 mm		
Temperature	operation: –10 °C (14 °F) to +50 °C (122°F) storage: –25 °C (–13°F) to +70 °C (158°F)		



**Shock mount/table mounts**

	MZS 31	MZT 30	MZT 30-L
Connector	–	XLR-3F	XLR-5F
Power supply	48 V phantom power (P 48)		
Weight	approx. 1200 g	approx. 1206 g	
Dimensions (W x H x D)	120 mm x 43 mm x 170 mm		
Temperature	operation: –10 °C (14 °F) to +50 °C (122°F) storage: –25 °C (–13°F) to +70 °C (158°F)		

**MZC 30 connection cable for ceiling mounting**



Connections	XLR-3M   special coax socket for ME 3x
Power supply	12 – 48 V phantom power (P 12 – P 48)
Length	9 m
Diameter	Ø 1.1 mm

**In compliance with**

Europe



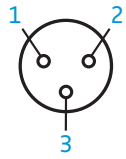
- EMC:
- EN 55103-1
  - EN 55103-2

**i** In case of interference from extraneous devices, the specifications may differ from those listed above.



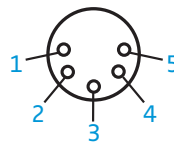
## Pin assignment

### MEB 102 | MEB 104: XLR-3



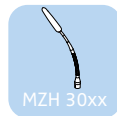
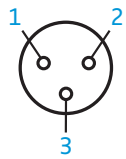
- 1 Ground
- 2 Microphone +
- 3 Microphone -

### MEB 102-L | MEB 104-L: XLR-5



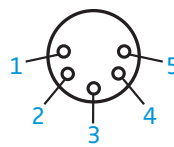
- 1 Ground
- 2 Microphone +
- 3 Microphone -
- 4 LED (H -> green, L -> red)
- 5 LED (H -> red)

### MEG 14-40 | MZH 30xx: XLR-3



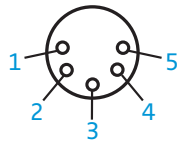
- 1 Ground
- 2 Microphone +
- 3 Microphone -

### MEG 14-40-L | MZH 30xx-L: XLR-5



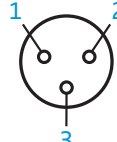
- 1 Ground
- 2 Microphone +
- 3 Microphone -
- 4 LED: 9 – 30 V DC any polarity
- 5 LED: 9 – 30 V DC any polarity

### MEG 14-40-L-II: XLR 5



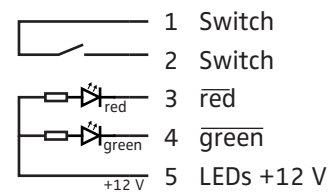
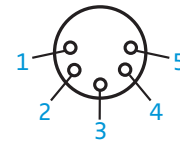
- 1 Microphone Ground
- 2 Microphone +
- 3 Microphone -
- 4 LED Ground
- 5 LED: 12 – 30 V

### MEB 114: XLR 3

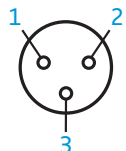


- 1 Ground
- 2 Microphone +
- 3 Microphone -

### MAS 1: XLR 3 mic in

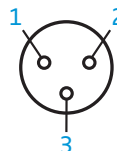


### MAS 133: XLR 3 mic in



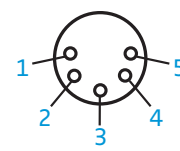
- 1 Ground
- 2 Microphone +
- 3 Microphone -

### MAS 133: XLR 3 mic out



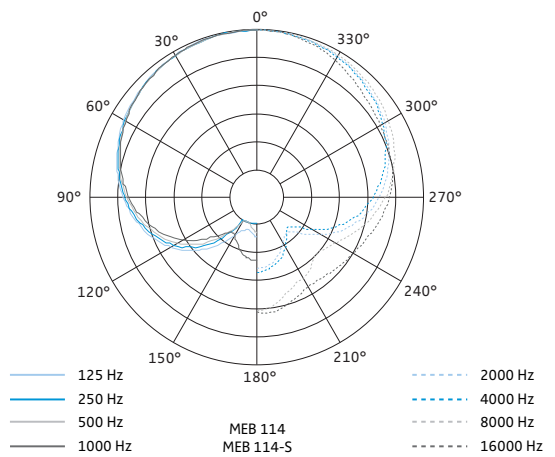
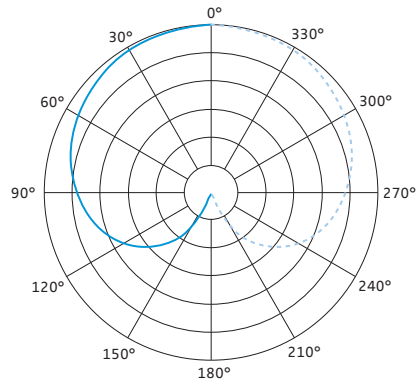
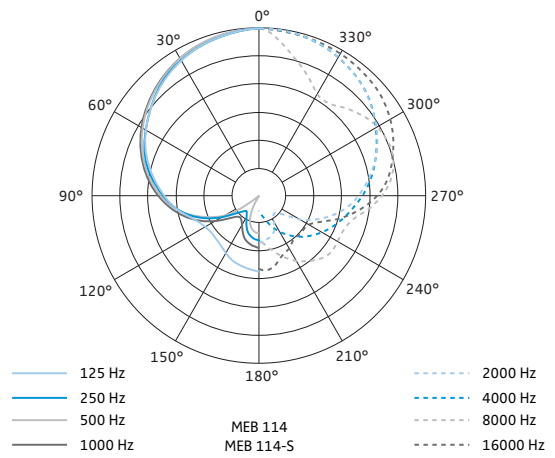
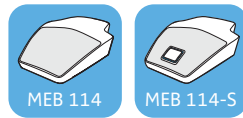
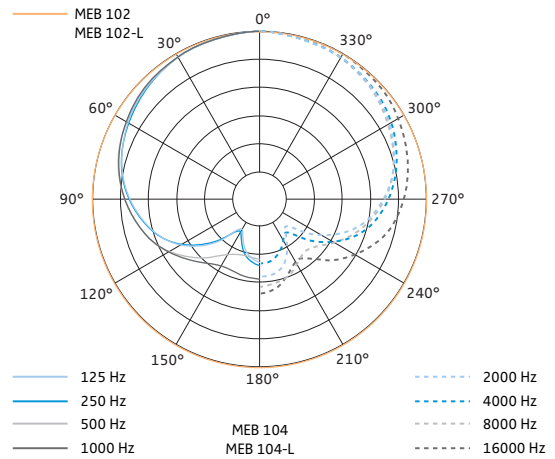
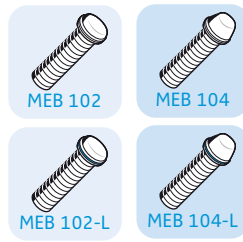
- 1 Microphone -
- 2 Microphone +
- 3 Ground

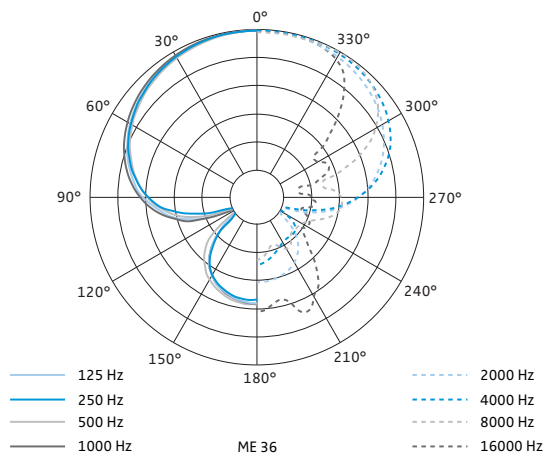
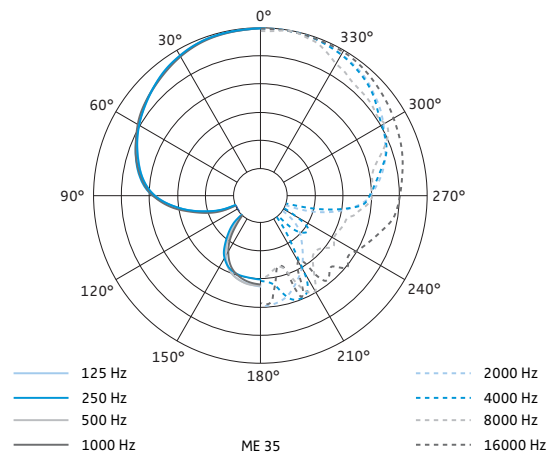
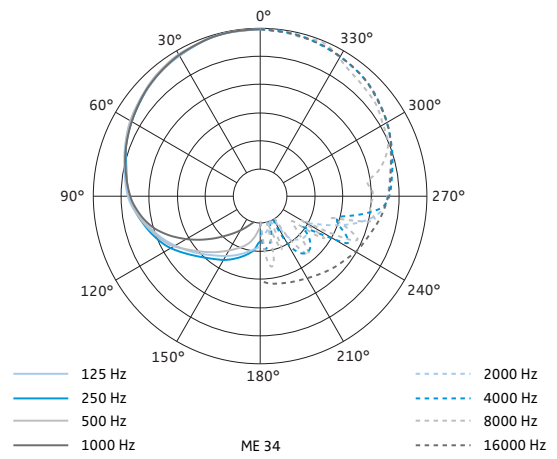
### MAS 133: XLR 5 switch



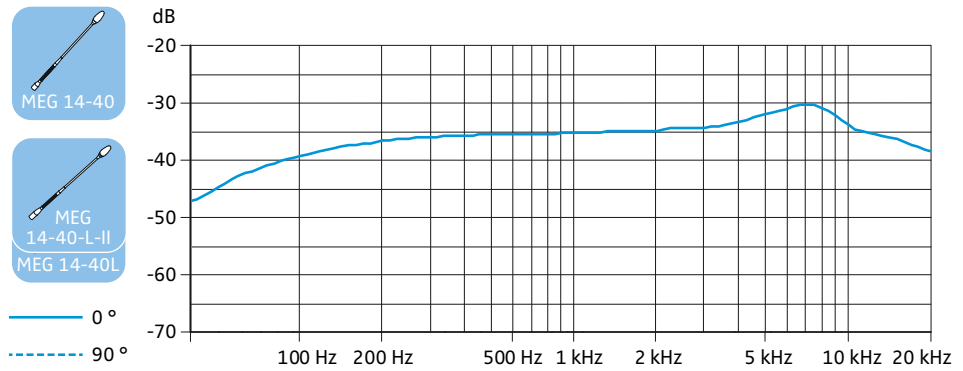
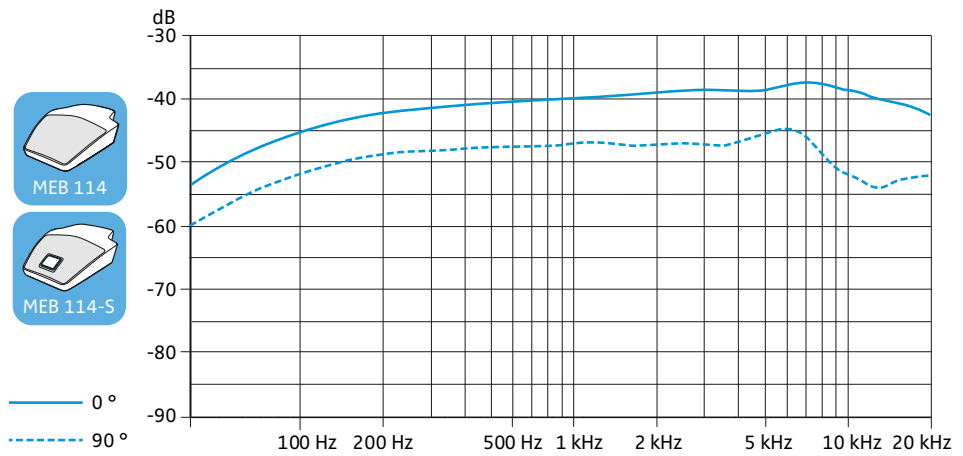
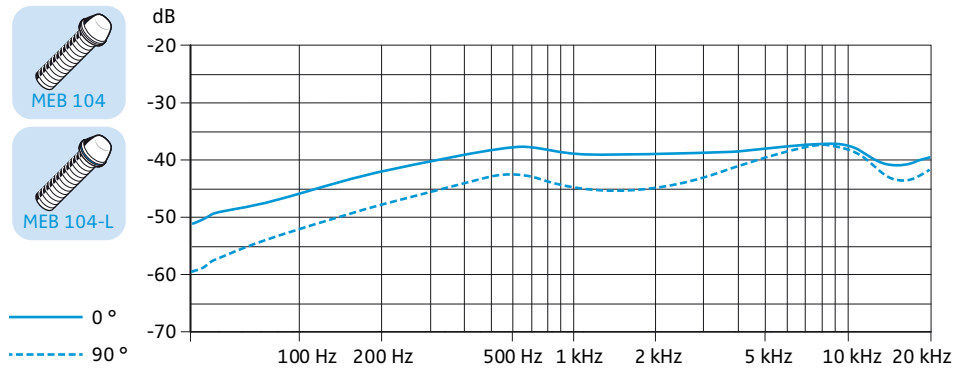
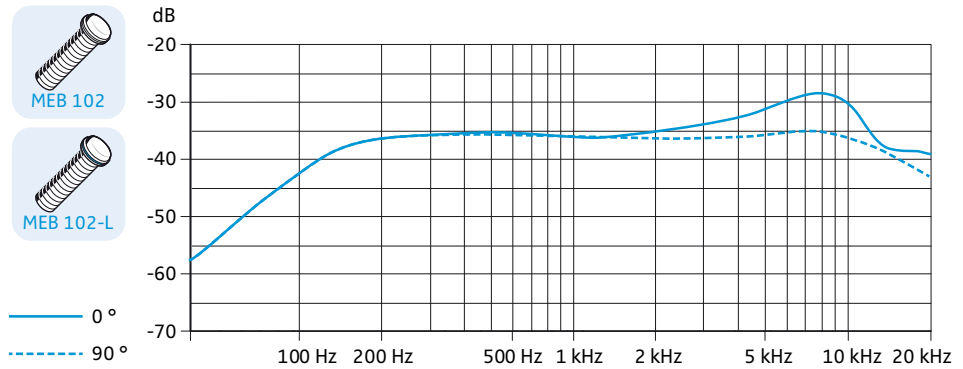
- 1 Ground
- 2 Switch
- 3 LED red -
- 4 LED green -
- 5 LEDs +12 V

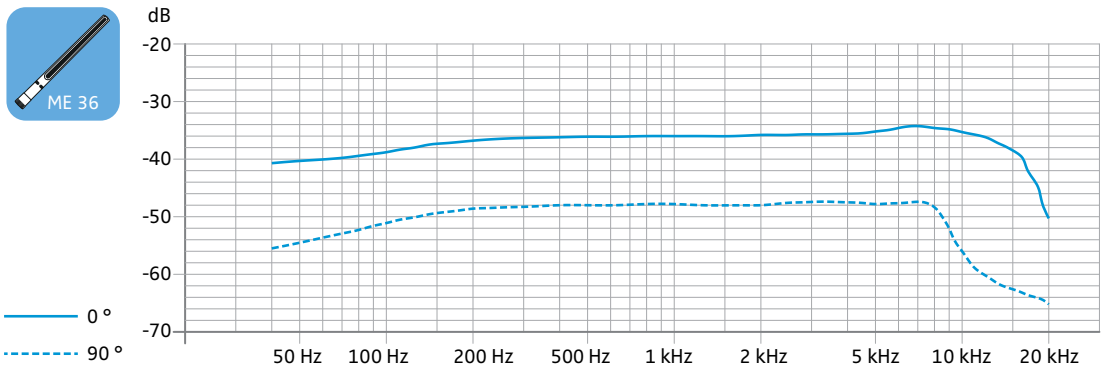
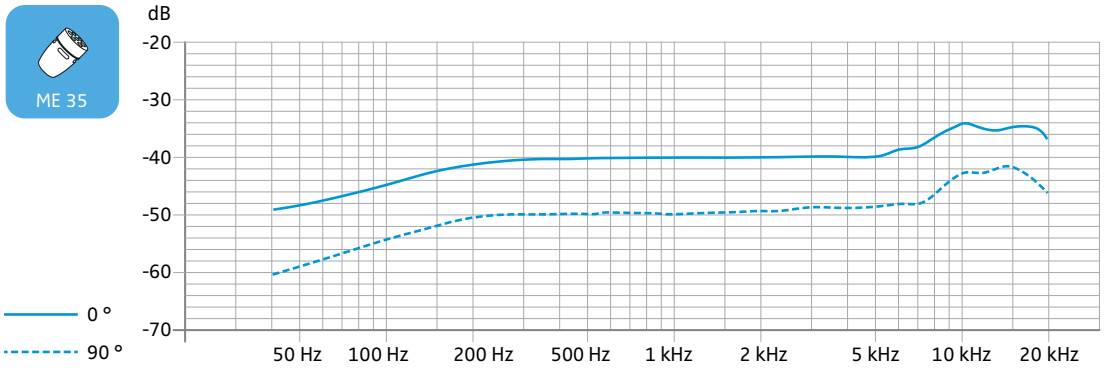
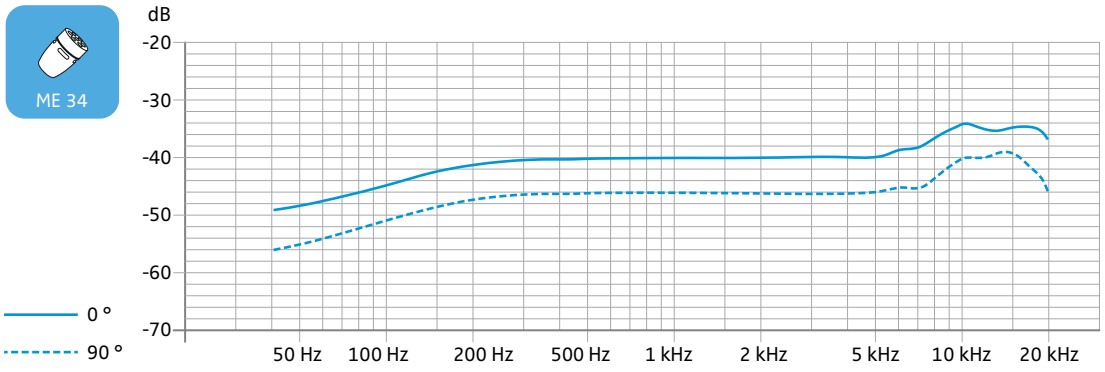
## Polar diagrams





## Frequency response curves





## Manufacturer Declarations

### Warranty

Sennheiser electronic GmbH & Co. KG gives a warranty of 24 months on this product.

### In compliance with the following requirements



- WEEE Directive (2012/19/EU)  
Please dispose of the products at the end of their operational lifetime by taking them to your local collection point or recycling center for such equipment.



- Australia/New Zealand

### CE Conformity



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

