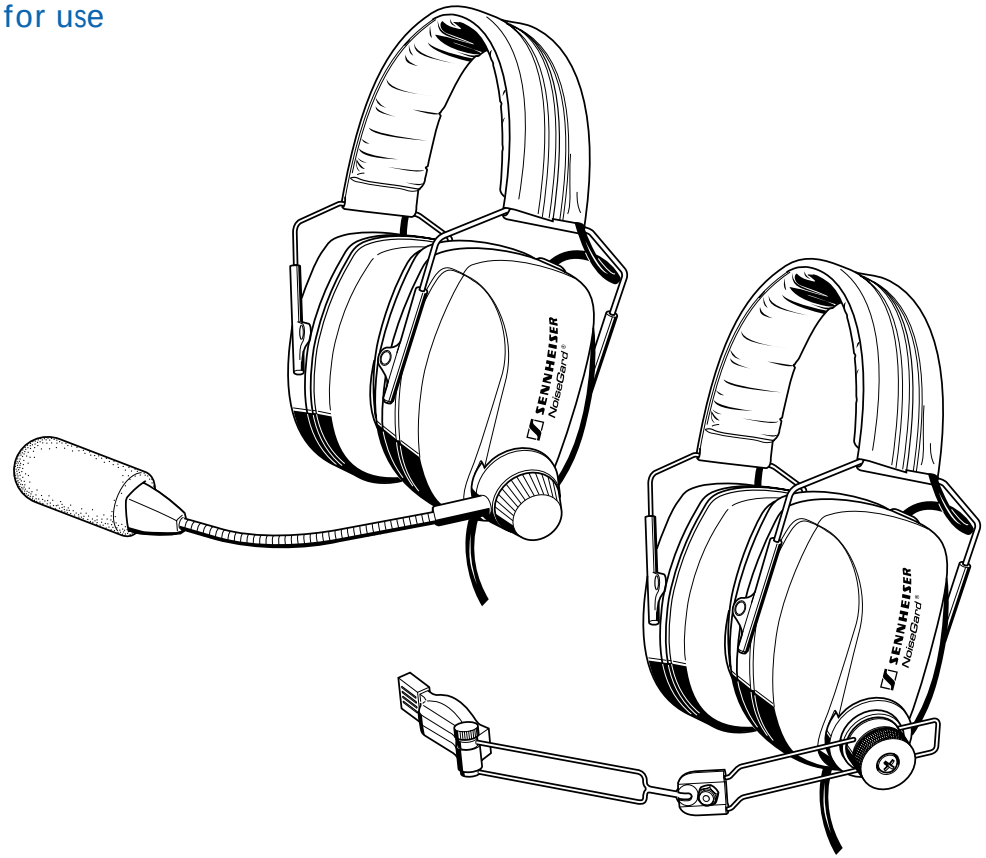
SENNHEISER

Instructions for use



Headset

HMEC 300
HMEC 302
HMEC 305
HMEC 305-C
HMEC 306
HMEC 322
HMEC 400
HMDC 322

NoiseGard™

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The HMEC 300, HMEC 302, HMEC 305,HMEC 305-C, HMEC 306, HMEC 322, HMEC 400 and HMDC 322 are pilot headsets with closed ear protector headphones and NoiseGard™ active noise compensation for use in helicopters, propeller and turboprop aircraft.

Safety tips

- With the NoiseGard™ active noise compensation turned on, typical aircraft sounds (for example, those from engines, propellers, warning alarms, etc.) may sound different to you. Before operating any aircraft, make sure that, with NoiseGard™ turned on, you can hear and recognize these sounds. Set the volume to safe levels that do not interfere with your ability to hear informational sounds and warning alarms.
- Do not attempt to repair the headset yourself. If problems occur, contact your Sennheiser agent for assistance.
- Only replace parts of the headset whose replacement is described in this manual. All other parts of the headset must be replaced by your Sennheiser agent.
- Do not immerse the headset in water! For information on how to clean the headset, contact your Sennheiser agent.

Headset features

HMEC 300 NoiseGard™ headset

- New active headset with effective attenuation of external noise across the entire frequency spectrum due to NoiseGard™ active noise compensation
- NoiseGard™ active noise compensation provides clear communications even in the noisiest environment
- Excellent comfort due to very low weight, soft ear cushions and padded headband as well as best possible freedom of movement due to unilateral connecting cable
- Foldable headband for easy and space-saving storage
- Clear communications due to MKE 45-1 electret microphone with adjustable sensitivity
- Microphone can be easily positioned and worn on either left or right side due to flexible microphone boom with quick-fixing device
- Optimum radio reception due to headphone systems with wide frequency response
- Integrated volume control
- Adaption to the aircraft intercom system via Mono/Stereo switch
- With the NoiseGard™ active noise compensation turned off, the headset can be used as a conventional headset

- Power supply for NoiseGard™ is provided via on-board power supply system, cigarette lighter socket or battery pack
- Fail safe operation in case of power failure
- Supply voltage for the NoiseGard™ system is processed by the in-line electronics in the connecting cable
- Made in Germany, two-year warranty

Product variants

HMEC 302 NoiseGard™ headset

The HMEC 302 differs from the HMEC 300 in the following features:

- Connection of microphone and NoiseGard™ electronics via PJ-068 plug

HMEC 305 NoiseGard™ headset

The HMEC 305 differs from the HMEC 300 in the following features:

- No Mono/Stereo switch
- Connection of headphones, microphone and NoiseGard™ electronics to the on-board power supply system (12–35 V DC) via XLR-5 plug

HMEC 305-C NoiseGard™ headset

The HMEC 305-C differs from the HMEC 300 in the following features:

- No Mono/Stereo switch
- Connection of headphones and microphone via XLR-5 plug

HMEC 306 NoiseGard™ headset

The HMEC 306 differs from the HMEC 300 in the following features:

- Connection of headphones, microphone and NoiseGard™ electronics to the on-board power supply system (12–35V DC) via 6-pin Redel plug

HMEC 322 NoiseGard™ headset

The HMEC 322 differs from the HMEC 300 in the following features:

- No Mono/Stereo switch
- Coiled cable
- Connection of headphones and microphone via U-174/U jack plug to a high impedance interface in the helicopter

HMEC 400 NoiseGard™ headset

The HMEC 400 differs from the HMEC 300 in the following features:

- Stylish silver design
- Leatherette ear cushions
- Headband padding can be buttoned

HMDC 322 NoiseGard™ headset

The HMDC 322 differs from the HMEC 300 in the following features:

- No Mono/Stereo switch
- Coiled cable
- M-87/AIC dynamic microphone and low impedance headphones
- Connection of headphones and microphone via U-174/U jack plug to a low impedance interface in the helicopter

Delivery includes

HMEC 300, HMEC 305-C, HMEC 322, HMEC 400 and HMDC 322 headsets

- Headset
- 3-pin XLR socket for aircraft panel mounting (power supply via the on-board system)
- Padded carry and storage bag with shoulder strap for headset and accessories
- Wind screen for microphone (except HMDC 322)
- MZQ 2002-1 Cable clip (Cat. No. 44740)

HMEC 302, HMEC 305 and HMEC 306 headsets

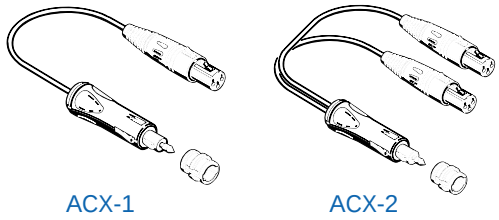
- Headset
- Padded carry and storage bag with shoulder strap for headset and accessories
- Wind screen for microphone
- MZQ 2002-1 Cable clip (Cat. No. 44740)

Recommended accessories

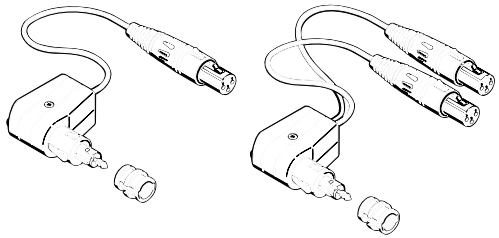
Replaceable gel ear cushions (Cat. No. 83140)

BP-03 battery pack (except for HMEC 302, HMEC 305 and HMEC 306)

Battery pack with XLR-3 socket for powering the NoiseGard™ electronics of the HMEC 300, HMEC 305-C, HMEC 322, HMEC 400 and HMDC 322 headsets. Four 1.5 V AA size alkaline manganese batteries (IEC LR 6) ensure approx. 15 hours of reliable operation (batteries are not included in the delivery). Length of connecting cable: 0.9 m.



ACX-1 ACX-2



ACX-11 ACX-22

Adapter cables (except for HMEC 302, HMEC 305 and HMEC 306)

Sennheiser offers special adapter cables for connecting the NoiseGard™ electronics of the HMEC 300, HMEC 305-C, HMEC 322, HMEC 400 and HMDC 322 headsets to the on-board power supply via the cigarette lighter socket:

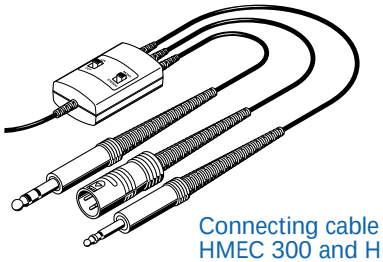
- **ACX-1** adapter cable for powering one headset via the cigarette lighter socket
- **ACX-2** adapter cable for powering two headsets via the cigarette lighter socket

The adapter cables are also available with a right-angled jack plug featuring a 7.5 A fuse and a green LED operation indicator:

- **ACX-11** adapter cable for powering one headset via the cigarette lighter socket
- **ACX-22** adapter cable for powering two headsets via the cigarette lighter socket

Connecting the headsets

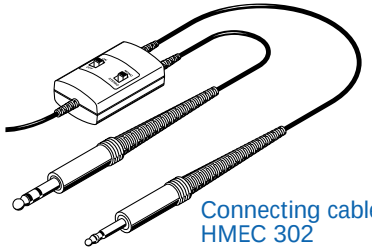
Connecting cables for headsets



Connecting cable for
HMEC 300 and HMEC 400

HMEC 300 and HMEC 400 headsets:

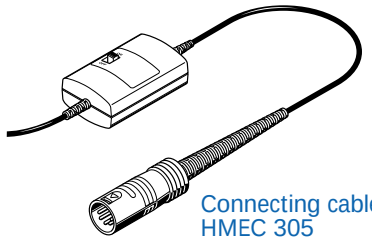
1 $^{1}/_{4}$" (6.35 mm) stereo jack plug for connecting the headphones
1 PJ-068 jack plug for connecting the microphone
1 XLR-3 plug for connecting the power supply for the NoiseGard™ electronics



Connecting cable for
HMEC 302

HMEC 302 headset:

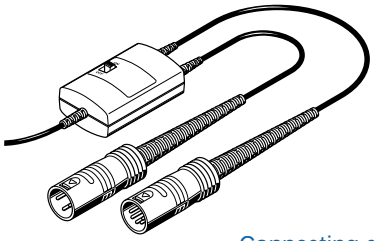
1 $/_{4}$" (6.35 mm) stereo jack plug for connecting the headphones
1 PJ-068 jack plug for connecting the microphone and the power supply for the NoiseGard™ electronics



Connecting cable for
HMEC 305

HMEC 305 headset:

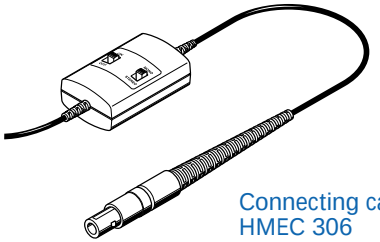
1 XLR-5 plug for connecting the headphones, the microphone and the power supply for the NoiseGard™ electronics



Connecting cable for
HMEC 305-C

HMEC 305-C headset:

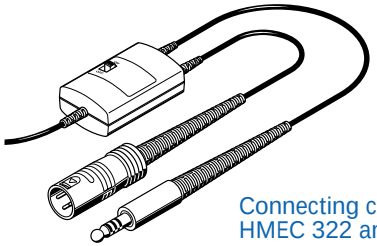
1 XLR-5 plug for connecting the headphones and the microphone
1 XLR-3 plug for connecting the power supply for the NoiseGard™ electronics



Connecting cable for
HMEC 306

HMEC 306 headset:

1 6-pin Redel plug for connecting the headphones, the microphone and the power supply for the NoiseGard™ electronics



Connecting cable for
HMEC 322 and HMDC 322

HMEC 322 and HMDC 322 headsets:

1 U-174/U jack plug for connecting the headphones and the microphone
1 XLR-3 plug for connecting the power supply for the NoiseGard™ electronics

Powering options

There are three options for powering the NoiseGard™ active noise compensation:

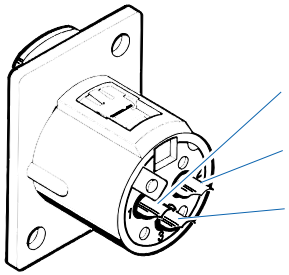
1. Connection to the on-board system (12–35 V DC)
2. Connection to the BP-03 battery pack
   (accessory, except for HMEC 302, HMEC 305 and HMEC 306)
3. Connection to the cigarette ligther socket (12–35 V DC) via adapter cable
   (accessory, except for HMEC 302, HMEC 305 and HMEC 306)

The supply voltage for the NoiseGard™ system is processed by the in-line electronics in the connecting cable.

1. Connecting the headset to the on-board system

The NoiseGard™ electronics can be connected to on-board power supply systems with operating voltages between 12–35 V DC.

> **Danger of short circuit!**
> Before turning on NoiseGard™, ensure that the on-board power supply system is protected by a 1 A fuse.



XLR-3 socket for HMEC 300, HMEC 305-C, HMEC 322, HMEC 400 and HMDC 322 headsets

The HMEC 300, HMEC 305-C, HMEC 322, HMEC 400 and HMDC 322 headsets are supplied with an XLR-3 socket for panel mounting in the aircraft. The XLR-3 socket must be mounted by a technician qualified to perform this type of installation.

HMEC 300 and HMEC 400 headsets:

- Connect the $^{1}/_{4}$" (6.35 mm) stereo jack plug for the headphones and the PJ-068 jack plug for the microphone to the corresponding jack sockets of your intercom.
- Connect the XLR-3 plug to the XLR-3 socket.

Headset HMEC 302:

- Connect the $^{1}/_{4}$" (6.35 mm) stereo jack plug for the headphones and the PJ-068 jack plug for the microphone to the corresponding jack sockets of your intercom.

HMEC 305 headset:

- Connect the XLR-5 plug to the aircraft's XLR-5 socket.

Headset HMEC 305-C:

- Connect the XLR-5 plug for the headphones and the microphone to the aircraft's XLR-5 socket.
- Connect the XLR-3 plug to the XLR-3 socket.

HMEC 306 headset:

- Connect the 6-pin Redel plug to the corresponding socket in the aircraft.

HMEC 322 and HMDC 322 headsets:

- Connect the U-174/U jack plug for the headphones and the microphone to the U-174/U socket of your intercom.
- Connect the XLR-3 plug to the XLR-3 socket.

2. Connecting the headset to the battery pack (except HMEC 302, HMEC 305 and HMEC 306)

The NoiseGard™ electronics of the HMEC 300, HMEC 305-C, HMEC 322, HMEC 400 and HMDC 322 headsets can also be powered via the BP-03 battery pack (☛ 'Recommended accessories'). The battery pack can be operated either on standard or rechargeable batteries (not included in the delivery). However, to ensure a longer operating time, we would recommend using standard AA size alkaline manganese batteries (IEC LR6). If operated on rechargeable batteries, the operating time will be reduced to approx. 3 hours.

Inserting / replacing the the batteries

- ► Open the cover of the battery compartment.
- ► Insert four AA size alkaline-manganese batteries (IEC LR6). Observe correct polarity when inserting the batteries.
- ► Close the cover of the battery compartment.

LED operation and battery status indication

The battery pack has two control LEDs.

Green LED:	The battery pack is turned on and the battery capacity is sufficient.
Red LED:	The batteries are low. Replace the batteries.

Connecting the headset, turning on the battery pack

- Connect the XLR-3 plug of the headset connecting cable to the XLR-3 socket on the connecting cable of the battery pack.
- **HMEC 300 and HMEC 400 headsets:** Connect the $^{1}/_{4}$" (6.35 mm) stereo jack plug for the headphones and the PJ-068 jack plug for the microphone to the corresponding jack sockets of your intercom.

  HMEC 305-C headset: Connect the XLR-5 plug for the headphones and the microphone to the aircraft's XLR-5 socket.

  HMEC 322 and HMDC 322 headsets: Connect the U-174/U jack plug for the headphones and the microphone to the U-174/U socket of your intercom.
- Turn on the battery pack by setting the ON/OFF switch to ON. The green LED power indicator lights up.

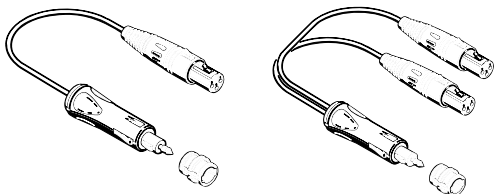
  Note:

  When using the battery pack, the ON/OFF switch integrated into the headset connecting cable is out of operation.

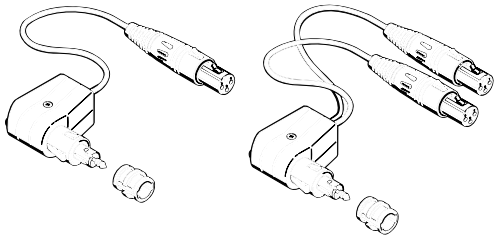
Attaching the battery pack to clothing

The battery pack can be attached to clothing by means of the supplied attachment clip, Velcro tape is also supplied.

3. Connecting the headset via a cigarette lighter adapter cable (except HMEC 302, HMEC 305 and HMEC 306)



ACX-1 ACX-2



ACX-11 ACX-22

Sennheiser offers special adapter cables with XLR-3 socket for connecting the NoiseGard™ electronics of the HMEC 300, HMEC 305-C, HMEC 322, HMEC 400 and HMDC 322 headsets to the on-board power supply via the cigarette lighter socket:

- **ACX-1** adapter cable for powering one headset via the cigarette lighter socket
- **ACX-2** adapter cable for powering two headsets via the cigarette lighter socket

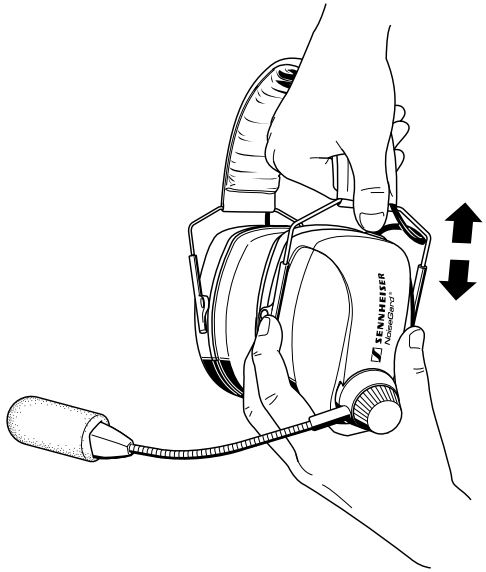
The adapter cables are also available with a right-angled jack plug featuring a 7.5 A fuse and a green LED operation indicator:

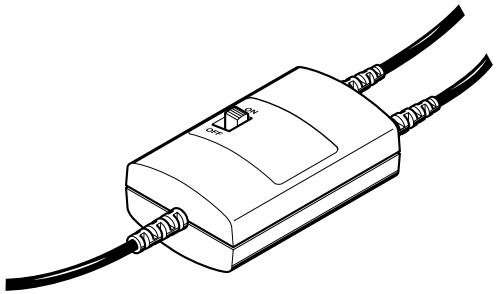
- **ACX-11** adapter cable for powering one headset via the cigarette lighter socket
- **ACX-22** adapter cable for powering two headsets via the cigarette lighter socket

Connecting the headset

► Connect the XLR-3 plug of the headset connecting cable to the XLR-3 socket of the adapter cable.

► Connect the plug or right-angled jack plug of the adapter cable to the cigarette lighter socket.





Preparing the headsets for use

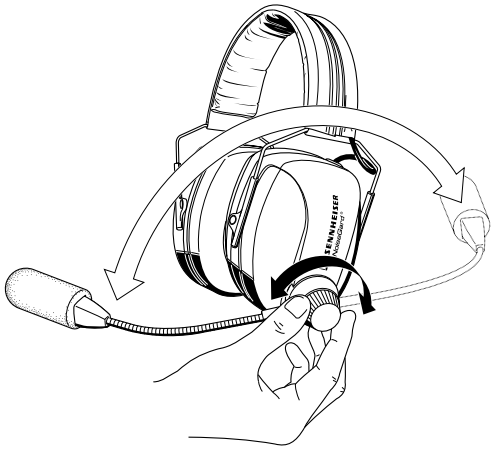
Adjusting the headband

For good noise attenuation and best possible comfort, the headband has to be adjusted to properly fit your head:

- ► Wear the headset so that the headband runs over the top of your head.
- ► Adjust the length of the headband so that
  - your ears are completely inside the ear cushions,
  - you feel even, gentle pressure around your ears,
  - a snug fit is ensured.

  Note:
  Make sure not to squeeze any connecting cable when adjusting the headband. Squeezing can damage the connecting cables.

- ► Turn on the NoiseGard™ active noise compensation by setting the ON/OFF switch to ON (☛ “Turning NoiseGard™ on/off”).
- ► Final adjustment is best made in a noisy environment.

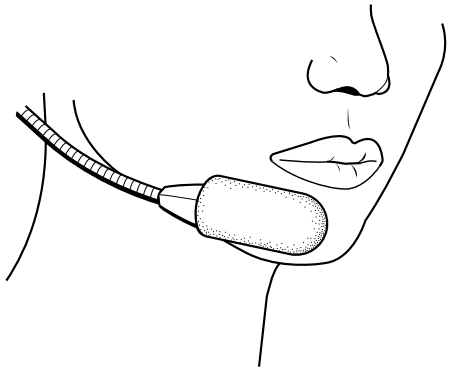


Positioning the microphone

Relocating the microphone boom

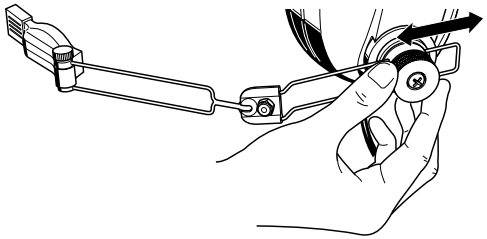
The microphone boom can be worn on either side of the mouth.

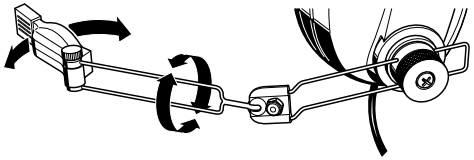
- ► Loosen the quick-fixing device.
- ► Rotate the microphone boom by 180°.
- ► Tighten the quick-fixing device.



Positioning the microphone towards the corner of the mouth

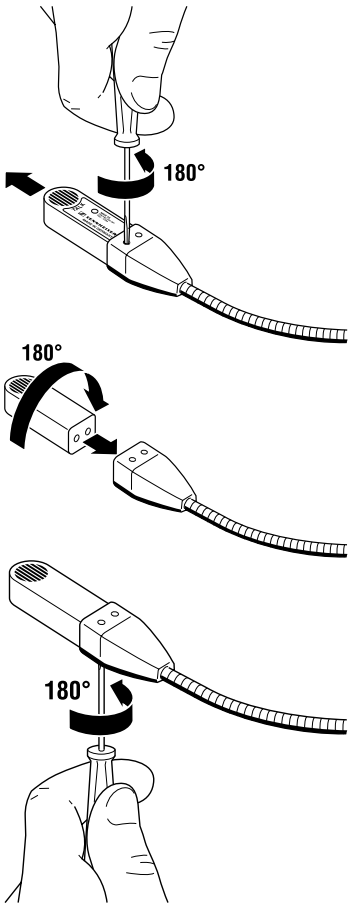
The HMEC 300, HMEC 302, HMEC 305, HMEC 305-C, HMEC 306, HMEC 322 and HMEC 400 headsets feature a flexible microphone boom. Bend the microphone boom so that the microphone is placed at the corner of the mouth. Maintain a distance of approx. 2 cm between microphone and mouth.





For positioning the microphone of the HMDC 322 headset, proceed as follows:

- Adjust the length of the microphone boom so that the microphone is placed at the corner of the mouth. To do so, loosen the quick-fixing device and adjust the microphone boom in length.
- Pull the middle part of the microphone boom towards the mouth so that the distance between microphone and mouth is approx. 2 cm.
- Tilt the microphone for final positioning.

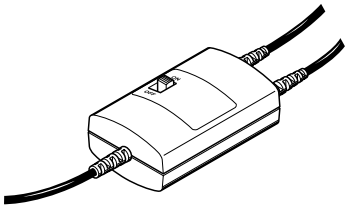


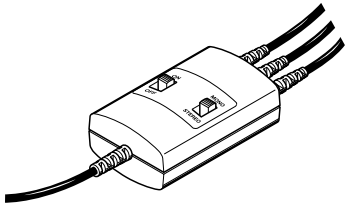
Additional information for helicopter use of the HMEC 322 headset

The polarity of the microphone connection in helicopters is not standardized. If the microphone of your headset does not work with the existing polarity, you can reverse the polarity on the headset by simply rotating the microphone module. To do so, please proceed as follows:

1. Pull the wind screen from the microphone.
2. Loosen the screws by approx. half a turn.
3. Pull the microphone module from the boom-arm.
4. Rotate the microphone module by 180°.
5. Put the rotated microphone module back into the boom-arm.
6. Now tighten the screws from the other side.
7. Slide the windscreen over the microphone.

Rotating the microphone module does not change its acoustic properties. Due to its noise-compensating pick-up pattern, the microphone can be used from either side.





Using the headsets

Turning NoiseGard™ on/off

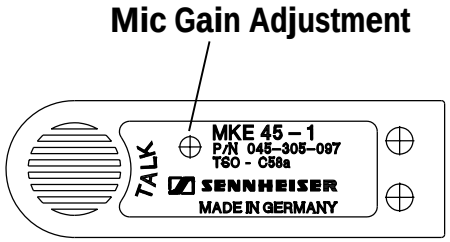
With the NoiseGard™ active noise compensation turned off, the headset can be used as a conventional headset.
Turn on the NoiseGard™ active noise compensation by setting the ON/OFF switch to ON.
When using the BP-03 battery pack, set the NoiseGard™ ON/OFF switch to ON and use the ON/OFF switch on the battery pack.

Mono/Stereo selection (except HMEC 305, HMEC 305-C, HMEC 322 and HMDC 322)

In general, you'll receive a mono sound source so that the Mono/Stereo switch can remain set to "Mono". When using a stereo intercom system, set the Mono/Stereo switch to "Stereo".

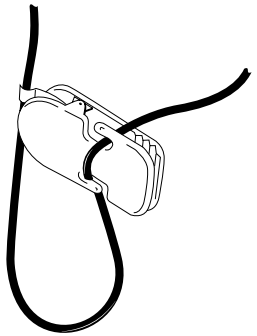
Adjusting the volume

Exposure to loud sounds can cause hearing damage!
Set the volume control to a medium value. Make sure that you can hear critical sounds such as warning alarms.



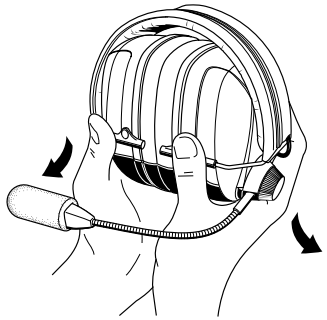
Adjusting the microphone gain

According to JTSO approval C58a, the microphone output voltage has to be factory-preset to 400 mV. If this output voltage is too high or too low for your intercom system, it can easily be re-adjusted on the microphone. To do so, use a small slotted screwdriver and turn the "Mic Gain Adjustment" screw (see illustration on the left) until you reach the desired setting.



Attaching the cable clip

The headphone cable can be fixed by means of the cable clip. Guide the headphone cable through the metal cable clip as shown in the illustration on the left. Attach the cable clip to your clothing and then loop the cable through the clip so that the headphone cable doesn't disturb you.



Folding up the headphones

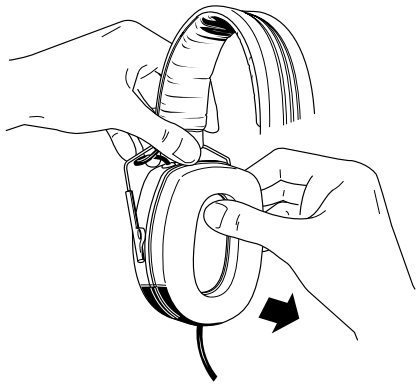
For easy and space-saving transportation, the earcups can be folded up and tucked between the headband.
Unfold the headphones by grasping both earcups and pulling them down and away from the headband.

Spare parts

The following spare parts are available from your Sennheiser agent:

- Wind screen for MKE 45-1 electret microphone
- Ear cushions
- Headband padding
- Cable clip
- Carry and storage bag with shoulder strap

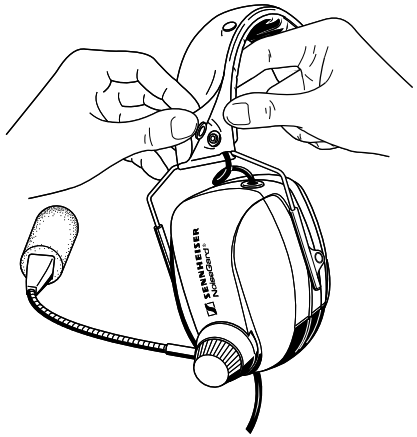
Replacing the wind screen



If the wind screen for the electret microphone shows signs of wear such as tears or holes, replace the wind screen. Pull the wind screen from the microphone. Gently slide-on the new wind screen and ensure that it fits securely over the microphone.

Replacing the ear cushions

Replace the ear cushions if they are damaged. Grasp behind the ear cushions and pull them up and away from the earcups. Slide the new ear cushions onto the earcups.
For best results replace the ear cushions after 100 hours of use or two years.



Replacing the headband padding

Replace the headband padding if it is damaged.

- ▶ Pull the Ziploc type fastening strips of the headband padding apart and remove the worn headband padding.
- ▶ Put the new headband padding around the headband.
- ▶ Pull the two edges of the headband padding together so that the fastening strips slightly overlap.
- ▶ Join the fastening strips.

In case of difficulty

If problems occur that are not listed in the below table, please contact your Sennheiser agent.

Problem	Possible cause and what to do
Clear communication but no active noise compensation	The NoiseGard™ electronics are turned off. ► Check to see if the ON/OFF switch is set to ON. The XLR-3 plug has been pulled out of the power source. ► Check to see if the XLR-3 plug is correctly connected to the power source. If aircraft powered: The aircraft fuse is defective. ► Check the aircraft fuse. If battery powered (except HMEC 302, HMEC 305 and HMEC 306): The batteries are low. ► Check to see if the green LED on the battery pack is lit. If the red LED is lit, replace the batteries.

Problem	Possible cause and what to do
Active noise compensation but very low volume communication	The volume control is set too low. ► Check the volume setting of the headset. The headphone connection has been pulled out (except HMEC 305, HMEC 305-C and HMEC 306). ► Check to see if the headphone jack plug is correctly connected.
Active noise compensation but reduced intelligibility	The microphone connection has been pulled out (except HMEC 305, HMEC 305-C and HMEC 306). ► Check to see if the microphone jack plug is correctly connected.
Communications in one ear only (only HMEC 300, HMEC 302, HMEC 306 and HMEC 306)	You are using a stereo intercom system but the headset is set to mono operation. ► Set the Mono/Stereo switch to ‘Stereo’. You are receiving a mono source but the headset is set to stereo operation. ► Set the Mono/Stereo switch to ‘Mono’.
Microphone output voltage set too high or too low	Re-adjust the output voltage on the microphone. ► To do so, use a small slotted screwdriver and turn the “Mic Gain Adjustment” screw (see illustration on page 133) until you reach the desired setting.

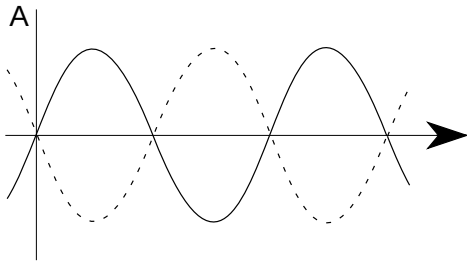
Valuable information on NoiseGard™

The NoiseGard™ principle

One of the greatest stress factors today is noise. Research has shown that noise affects the nervous system, and can cause tiredness, poor concentration, irritability and tension. Of even greater concern is the permanent damage to hearing that can result from noise at high levels.

This problem concerns pilots in particular. Cockpit noise amounts to about 80 dB(A) in jets and to 90 up to 97 dB(A) in turboprops. During takeoff and landing, the noise level is even higher. To be able to understand radio traffic in spite of the noisy environment, the ATC signal level must be set to at least 95 dB(A). Permanent hearing loss caused by the continuous noise in aircrafts is the reason why many pilots became prematurely disabled or lost their pilot´s license.

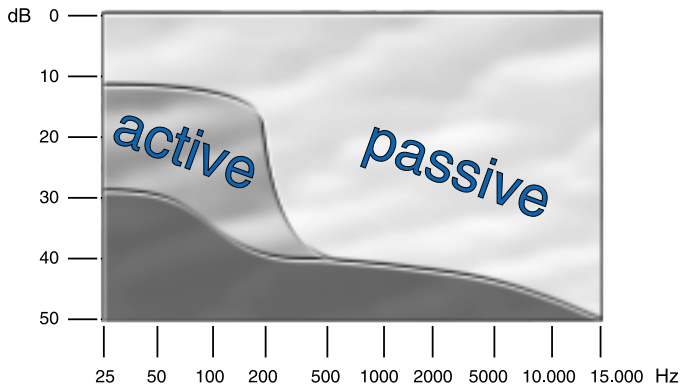
Circumaural communication headsets provide noise attenuating properties and are commonly used to address this problem. However, the noise attenuation of these headsets is uneven. High frequencies are reduced considerably, but low frequency wind and engine noise, the most prominent noise in many of today's aircrafts, is attenuated very little.



In response to these problems, Sennheiser has developed an active noise compensation system – NoiseGard™ – which, combined with a high-quality passive hearing protector, provides consistent noise attenuation over the entire audio range. The overall noise level is reduced so that the radio volume can be turned down but enough noise still remains for the pilot to safely monitor the aircraft engines.

NoiseGard™ active noise compensation is achieved by generating a signal identical in sound pressure level but exactly reversed in phase to the noise signal, the effect being that the out-of-phase signal cancels most of the noise signal.

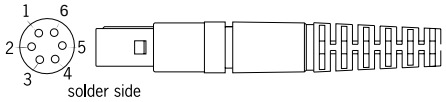
Active noise compensation is accomplished in the following manner: Each earcup includes a microphone, a feedback control circuit, and a transducer to reproduce both the communication and the noise cancelling signal. The feedback control microphones sense the total sound pressure within each earcup resulting from both the desired radio signal from the receiver and the undesired noise that has come through the earcup. The microphone signal is amplified and the radio signal is subtracted from it. The remaining signal (noise) is then filtered and inverted and the radio signal is added back in. Eventually, the entire signal is amplified and fed back to the transducer in each earcup. Since the noise component of the signal is inverted, it cancels the noise signal coming through the earcup. The radio signal remains unaffected, as it was not processed through the cancellation circuits.



The above diagram shows noise compensation with NoiseGard™: Passive hearing protectors effectively attenuate noise from the middle and upper frequency range, the effect decreasing sharply in the lower range. However, active noise compensation with NoiseGard™ combined with passive hearing protectors results in a reduction of noise of approx. 25 dB in the 25–500 Hz frequency range. The total attenuation resulting from active and passive noise compensation is about 30 dB over the entire audio range.

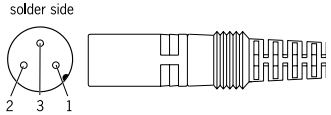
A 10 dB reduction in noise is perceived subjectively as a halving in volume. A further reduction in noise of 10 dB again results in a decrease in unwanted noise by 50 %.

Connector assignment



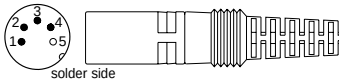
Redel connector (NoiseGard™)

1 Power supply NoiseGard™ (DC+)
2 Audio Lo / DC –
3 Audio Hi left
4 Audio Hi right
5 Microphone Hi
6 Microphone Lo



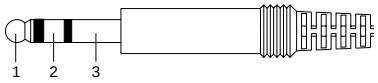
XLR-3 connector (NoiseGard™)

1 Power supply NoiseGard™ (DC+)
2 Ground
3 Do not connect!



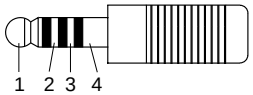
XLR-5 connector

HMEC 305	HMEC 305-C
1 Audio Hi	1 Audio Hi
2 Audio Lo / DC –	2 Audio Lo
3 Microphone Hi	3 Microphone Hi
4 Microphone Lo	4 Microphone Lo
5 Power supply NoiseGard™ (DC+)	5 Not assigned!



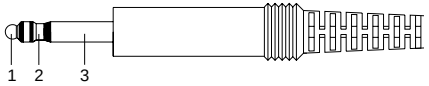
$^{1}/_{4}$” (6.35 mm) stereo jack plug

1 Audio Hi left
2 Audio Hi right
3 Audio Lo



U174/U jack plug

1 Microphone Lo
2 Audio Hi
3 Microphone Hi
4 Audio Lo



PJ-068 jack plug

HMEC 302	HMEC 300
1 Power supply NoiseGard™ (DC+)	1 Not assigned!
2 Microphone Hi	2 Microphone Hi
3 Microphone Lo / DC –	3 Microphone Lo

Technical data

	HMEC 300	HMEC 302	HMEC 306	HMEC 400
Headphones				
Transducer principle	dynamic			
Ear coupling	circumaural, closed			
Frequency response	45–15,000 Hz			
Nominal impedance active/passive	300/150 Ω, mono 600/300 Ω, stereo			
Attenuation (active and passive)	> 25 – 40 dB			
Max. sound pressure level	120 dB (± 5%)			
Contact pressure	approx. 10 N			
Microphone incl. preamplifier				
Transducer principle	electret mic capsule, noise-compensated, MKE 45-1			
Frequency response	300–5,000 Hz			
Sensitivity	–			
Max. sound pressure level	120 dB			
Min. terminating impedance	150 Ω			
Output voltage	400 mV ± 3 dB at 114 dB (as per RTCA/DO 214)			
Supply voltage	typ. 16 V DC (8 – 16 V DC, approx. 8 – 25 mA, as per RTCA/DO 214)			

General data

		HMEC 300	HMEC 302	HMEC 306	HMEC 400
Connecting cable		1.5 m, unilateral			
Weight without cable		370 g			
Power supply for NoiseGard™		12–35 V DC			
Current consumption		27 mA (zero signal current), max. 80 mA			
Fuse		500 mA thermo fuse			
Connectors		6.35 mm stereo jack plug for headphones, PJ-068 jack plug for mirophone, XLR-3 for NoiseGard™	6.35 mm stereo jack plug for headphones, PJ-068 jack plug for microphone and NoiseGard™	6-pin Redel plug for headphones, microphone and NoiseGard™	6.35 mm stereo jack plug for headphones, PJ-068 jack plug for mirophone, XLR-3 for NoiseGard™
Controls		Mono/Stereo switch On/off switch for NoiseGard™ Volume control for headphones			
Temperature range	Operation	–15°C ... + 55°C			
	Storage	–55°C ... + 55°C			
Operating time	Battery pack	with batteries (four 1.5 V AA size alkaline-manganese batteries): approx. 15 hours with rechargeable batteries: approx. 3 hours			

Technical data

	HMEC 305	HMEC 305-C	HMEC 322	HMDC 322
Headphones				
Transducer principle	dynamic			
Ear coupling	circumaural, closed			
Frequency response	45–15,000 Hz			
Nominal impedance active/passive	300/150 Ω, mono			50/35 Ω, mono
Attenuation (active and passive)	> 25 – 40 dB			
Max. sound pressure level	120 dB (± 5%)			
Contact pressure	approx. 10 N			
Microphone incl. preamplifier				
Transducer principle	electret mic capsule, noise-compensated, MKE 45-1			dynamic mic capsule, noise-compensated, M-87/AIC
Frequency response	300–5,000 Hz			500–4,000 Hz
Sensitivity	–			1.8–4 µV / 74 dB at 5 Ω
Max. sound pressure level	120 dB			–
Min. terminating impedance	150 Ω			–
Output voltage	400 mV ± 3 dB at 114 dB (as per RTCA/DO 214)			–
Supply voltage	typ. 16 V DC (8 – 16 V DC, approx. 8 – 25 mA, as per RTCA/DO 214)			–

General data

	HMEC 305	HMEC 305-C	HMEC 322	HMDC 322
Connecting cable	1.5 m, unilateral		coiled cable, unilateral	
Weight without cable	370 g			
Power supply for NoiseGard™	12–35 V DC			
Current consumption	27 mA (zero signal current), max. 80 mA			
Fuse	500 mA thermo fuse			
Connectors	XLR-5 for headphones, microphone and NoiseGard™	XLR-5 for headphones and microphone. XLR-3 for NoiseGard™	U-174/U jack plug for headphones and microphone, XLR-3 for NoiseGard™	
Controls	On/off switch for NoiseGard™ Volume control for headphones			
Temperature range	Operation	–15°C ... + 55°C		
	Storage	–55°C ... + 55°C		
Operating time Battery pack	with batteries (four 1.5 V AA size alkaline-manganese batteries): approx. 15 hours with rechargeable batteries: approx. 3 hours			

CE

Certificate of Conformity

Sennheiser electronic GmbH & Co. KG declare that this device conforms to the applicable CE standards and regulations.

For up-to-date information on Sennheiser products, you can also visit the Sennheiser Web site at “http://www.sennheiser.com”.