

ETYMÖTIC RESEARCH, INC.

ER•4 microPro™

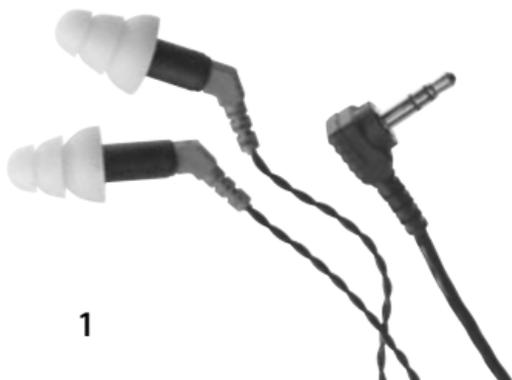
reference-quality insert earphones



User Guide

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ABOUT ETYMOTIC RESEARCH, INC.

Etymotic Research, Inc. (ER) is a research, development and manufacturing company that designs products to measure, improve and protect hearing. ER has developed some of the most innovative hearing technology available today. Etymotic means “true to the ear.”

Other ETYMOTIC RESEARCH products:

ER-6 Isolator™ insert earphones

Musicians Earplugs (custom hearing protection)

ER-20 High Fidelity earplugs

ETY-COM™ cellphone headset

WARRANTY

Etymotic Research, Inc. warrants this product against defects in material or workmanship for a period of 1 year from the date of original purchase from an authorized Etymotic distributor or reseller. Proof of purchase is required. The warranty can be extended for 1 additional year if Etymotic receives a warranty card with proof of purchase any time within the first year. ER will repair or replace the defective product at its option if returned within the warranty period to our service facility. This warranty is in lieu of all other warranties, expressed or implied, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose.

ABOUT ER-4 EARPHONES

Noise reduction with **ER-4 MicroPro** earphones occurs naturally from the inserts. Other earphones with active noise-cancelling add circuit noise and require bulky batteries.

In-the-ear, high fidelity transducers combine flat frequency response with isolation from external noise.

The white 3-flange eartips provide 35 dB average external noise isolation. Foam eartips provide 41 dB average external noise isolation. Lowering surrounding noise allows the listener to hear the full dynamic range of recordings at lower reproduction levels.

ER-4 MicroPro earphones are ideal for a variety of consumer uses such as personal CD and DVD players, MP3 players, and computers. Professional uses include mixing and stage monitoring in the studio and during live performance.

DESCRIPTIONS

| ER-4B | ER-4S | ER-4P | |
|-------|-------|-------|----------------------------|
| • | • | • | Lightweight and portable |
| • | • | • | High accuracy |
| • | • | • | Noise isolation (20-25 dB) |
| | | • | Enhanced bass response |

ER-4P (Portable) earphones have enhanced bass and higher sensitivity. ER-4Ps can be used with portable CD, MP3, DVD and other players without requiring an additional amplifier. The ER-4P has 10 dB greater sensitivity at high frequencies and 13 dB more at low frequencies than the ER-4S. The higher sensitivity and enhanced bass of the ER-4P have made it the most popular earphone for most uses.

ER-4S (Stereo) earphones have the most accurate frequency response for reproducing CD and MP3 recordings. The sensitivity is comparable to home and professional earphones. ER-4S earphones are ideal for home stereo use and computer use. ER-4S earphones can be used with a headphone amplifier when using low power portable devices. ER-4S is the earphone preferred by musicians and audiophiles.

ER-4B (Binaural) earphones are for the binaural recording enthusiast. The ER-4B is the reference earphone for use with material that has not been equalized for loudspeaker playback.

SYSTEM INCLUDES

- ER-4 MicroPro earphones
- 5 ft. cord with 3.5 mm stereo phone plug
- 1/4" stereo phone adapter plug
- 6 white 3-flange eartips
- 10 foam eartips (medium)
- Filter changing tool
- 4 replacement filters
- Shirt clip
- Zippered pouch
- Storage box



OPTIONAL ACCESSORIES



Airline audio
jack adapter



Cable to convert
"P" to "S"

Replacement items and accessories are available at www.etymotic.com.

EARTIPS

In addition to six white 3-flanged eartips, **ER-4 MicroPro Earphones** are supplied with ten disposable foam eartips. Both types provide excellent sound reproduction when properly inserted.

White 3-flange eartips

These reusable eartips should be cleaned regularly.

Cleaning the white 3-flange eartips

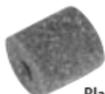
1. Carefully remove the eartip from the earphone.
2. Use water and mild soap to remove dirt and earwax from the eartip.
3. Rinse and completely dry the eartip.
4. Push the eartip on the stem until it rests against the large edge of the barrel.

Foam eartips

- Disposable foam eartips compress to a tight seal that holds the earphones firmly in place.
- The eartips at the end of the earphones can be replaced by sliding them off and on. A combination of twisting and pulling is recommended for eartip removal. Be careful not to bend the earphone.



Beige foam eartip
(sm—optional)



Black foam eartip
(med—included)



Yellow foam eartip
(lg—optional)



INSERTION

Blue earphone = left ear

Red earphone = right ear

Try the white 3-flange and foam eartips to determine the best fit for comfort and isolation. The sound quality and noise isolation depend on how well the eartips seal. If the earphones seem to lack bass, insert the earplug deeper into the ear canal to obtain a better seal, or try the other eartip option.

White 3-flange eartip insertion

- For best results, moisten the white plastic eartip before insertion.
- Carefully insert one earphone at a time, pulling up and out on the back of the ear. The earphone should seal deeply and comfortably in the ear canal.



Foam eartip insertion

- Use a foam eartip if a good seal cannot be obtained with a white eartip.
- Compress the foam at the end of the earphone by rolling it between your thumb and forefinger before inserting it. Hold the earphone in place for about 10 seconds while the foam expands to create a tight seal.

REMOVAL

Remove earphones slowly with a twisting motion to gradually break the seal.

CHANGING FILTERS

ER-4 MicroPro Earphones have special filters that shape the frequency response and prevent earwax from entering the earphones. These filters, identified by a green acoustic mesh in a small metal barrel, are located at the end of the earphone and are visible when the eartip is removed. When the filters become clogged they should be replaced. A dirty filter will reduce or block the earphone output. The frequency with which the filters need to be changed will vary widely among users. The filters should be changed if the volume decreases or the sound quality declines.



1. Remove eartip



2. Remove damper with tool



3. Insert new damper



5. Attach eartip

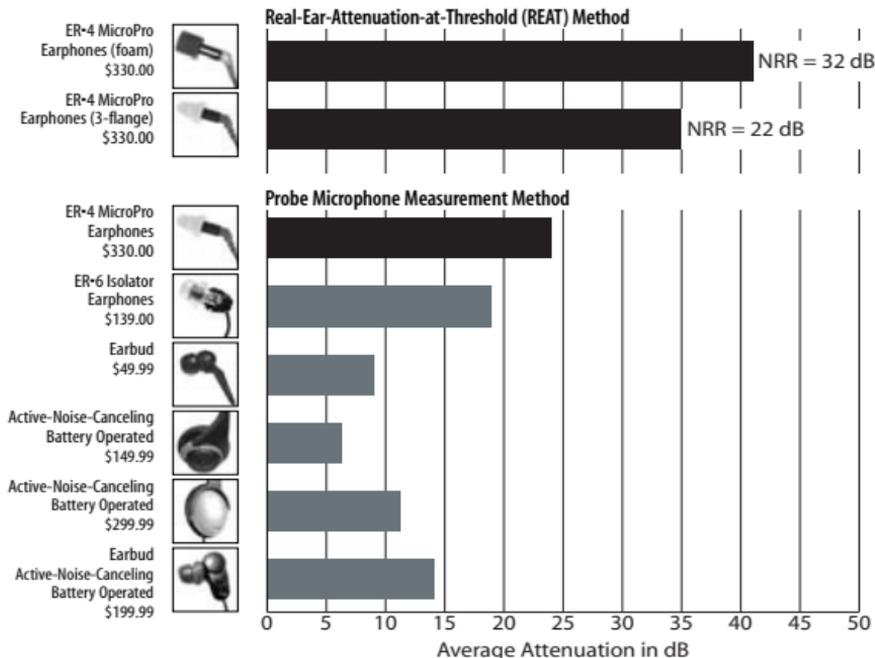


4. Gently press flush against flat surface

PROPER CARE

- Do not expose earphones to extreme temperatures.
- Avoid dropping or strong impact. Extreme shock can damage the earphones.
- Always leave an eartip on the earphone for shock protection.
- Keep earphones away from water as this can adversely affect sound quality. Perspiration entering the nozzle may cause the earphone to temporarily stop working. Normal operation usually returns after the earphone dries out.
- Do not pull on the cord to remove it from the jack or from the ear.
- Avoid bending the barrel in the center of the cord.
- Clean or replace the white 3-flange eartips prior to use by others.
- Replace disposable foam eartips regularly.
- Earwax buildup can reduce the earphone output. When the filters become clogged they should be replaced. See **Changing the Filters** on page 8.

NOISE ISOLATION

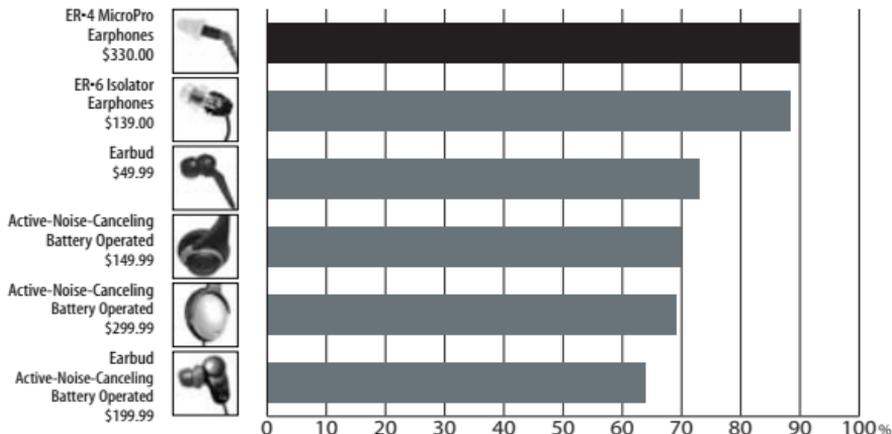


How We Measure Noise Isolation

Real-Ear-Attenuation-at-Threshold (REAT) Method—The ANSI standard method of measuring the noise attenuation of hearing protectors and earphones is to compare the quietest sound heard with the earphone in place to the quietest sound heard with the ears open. This REAT method is the basis for all OSHA Noise Reduction Ratings (NRR). ER-4 and ER-6 earphones were measured with the REAT method at E-A-RCAL Laboratories, Indianapolis IN. The results are shown in the top two bars in the graph above.

Probe Microphone Measurement Method—Active noise-canceling earphones cannot be measured with the REAT method because their circuit noise interferes with the measurement. ER-4 and ER-6 earphones were compared to active noise-canceling earphones using a probe microphone method: A calibrated 84 dB SPL broad-band pink noise was generated in a reverberation room using four uncorrelated noise sources. The sound pressure developed in the ear was measured with a 2.5 mm microphone located deep in the ear canal. The noise reduction of each earphone was calculated as the difference between the noise level in the open ear and the noise level with the earphone in place. The lower bars in the above graph represent attenuation measured by the probe microphone method.

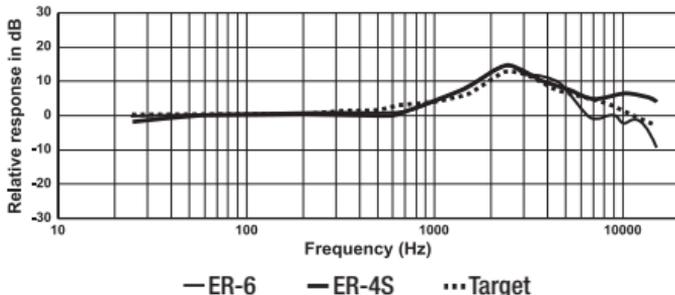
RESPONSE ACCURACY



How We Measure Response Accuracy

Earphone response was measured on a KEMAR[®] manikin which has the same acoustic properties as the average head and ear. 25-band accuracy scores are calculated by summing the difference between the earphone response and the target response in each 1/3-octave band from 50 Hz to 12.5 kHz.

Response of ER-6 and ER-4 Earphones Compared to Target (100% Accurate Reproduction)



SPECIFICATIONS

Frequency response: 20 Hz to 16 kHz ± 4 dB

Acoustic polarity: +electrical = +acoustic

Transducer type: Balanced armature

1 kHz sensitivity (ER-4B/ER-4S): 108 dB SPL for a 1.0 volt input

1 kHz sensitivity (ER-4P): 108 dB SPL for a 0.25V input

Impedance (ER-4B/ER-4S): 100 Ohms nominal

Impedance (ER-4P): 27 Ohms nominal

Maximum output: 122 dB SPL

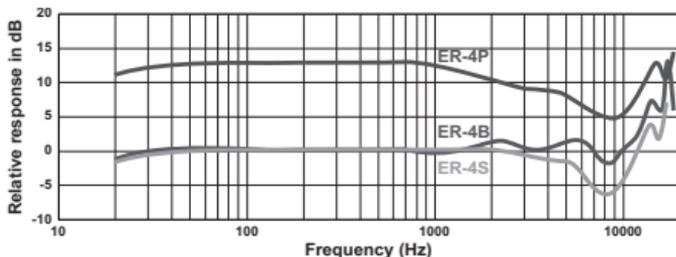
Maximum continuous input (ER-4B/ER-4S): 3.0 Vrms

Maximum continuous input (ER-4P): 0.75 Vrms

Weight: Less than 1 oz.

Cable: 5' with 3.5 mm stereo plug

RESPONSE OF ER-4 EARPHONES



This graph shows the relative real-ear response (diffuse-field-referenced eardrum pressure response) of the ER-4B, ER-4S, and ER-4P earphones. These are equalized for binaural manikin recordings (4B), normal stereo recordings (4S), and higher output with portable players (4P).

CAUTION

Consult a physician or audiologist if you have excessive ear wax, difficulty inserting the eartips, or discomfort after prolonged use.

ER-4 MicroPro earphones exclude most external sounds even at low listening volumes. It is unsafe to use insert earphones while driving a motorized vehicle, operating machinery, bicycling or jogging, because you may not be alerted to potential danger.

Do not use the earphones at excessively loud levels. Noise-induced hearing loss is a function of exposure time, the average sound level and the peak of very loud sounds. Decreased listening levels allow for longer periods of safe listening time.

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The ER-4 MicroPro™ Earphones and ER-6 Isolator™ Earphones are covered by one or more of the following U.S. patents: #4,677,679, #4,763,753, #5,887,070 and other patents pending.

