



*Melodyflex*

LIGHT WEAR FOR A  
POWERFUL HEARING

Bone Conduction Headset



## *Melodyflex* LIGHT WEAR FOR A POWERFUL HEARING

Melody Flex, the new bone conduction headset is AUTEL's solution to improve hearing quality of those affected by hearing loss treatable by bone conduction.

Melody Flex can be applied especially to those who suffer from hearing impairment due to physical deformities that limit the application of other hearing aids.

Melody Flex is a form of alternative conduction to the bone conduction spectacles. It is highly suited to those affected by hearing loss who seek an effective solution, that is also discreet and elegant.



## Light, discreet and elegant

Melody Flex has been designed with materials that have been chosen in order to obtain an object which is light to wear and has a refined design so to offer a comfortable and pleasant use.

Melody Flex wants to give those who wear it a feeling of comfort and confidence.

## Sound Performance

The new Autel bone conduction headset is provided with **Autel Flex** technology and an innovative **telescopic system**, that together guarantee:

- Simplicity in the fitting of the aid without having to resort to surgery or to substituting parts
- Elevated flexibility for a complete adaptability to the patient
- Highest bone conduction adherence to the mastoid area





## All shapes in a few simple actions

Melody Flex is thought to make the professional's fitting of the aid easy and to ensure a perfect adherence of the hearing aid to any physiognomy. Thanks to the several joining and bending points together with Autel Flex system the aid guarantees the highest adherence of the bone conductor to the patient's mastoid area.

A telescopic system and 4 joining points for a complete adaptability to any patient



Thanks to its **4 mechanical joining points** together with the **telescopic system**, Melody Flex ensures **a complete adaptability to any physiognomy**. The fitting telescopic system is simple and it permits an easy positioning of the conductor on the mastoid area. The aid can be adapted to the right size by adjusting a single screw on its back side.

From the band to the bone conductor:  
a perfect adherence for a superior  
performance

The high flexibility of the entire structure permits remarkable pliancy. The necessary reshaping can be applied both to the headset and to the bone conductor. Thanks to *Autel Flex* technology, the terminal can be rotated in any position so to reach the maximum adherence to the mastoid area and therefore obtaining the best sound performance.



# Flexible

*flex*

**Autel Flex technology** is a revolutionary innovation in the world of bone conduction hearing aids.

With Autel Flex system the fitting of the hearing aid becomes faster and more efficient thanks to the cold shaping process. This process, in comparison to the traditional hot methods, permits the audiologists to achieve sooner and in an easier way an absolutely precise setting of the bone conduction on the patient's mastoid area.

## Simple and performing



The performance is improved through the innovative **cold shaping method** that allows the expert to perform a more precise fitting operation of the bone conductor to the mastoid compared to the traditional methods.

This means obtaining results that are clearly better both in the adherence and consequently in the aid's sound output.

# Powerful

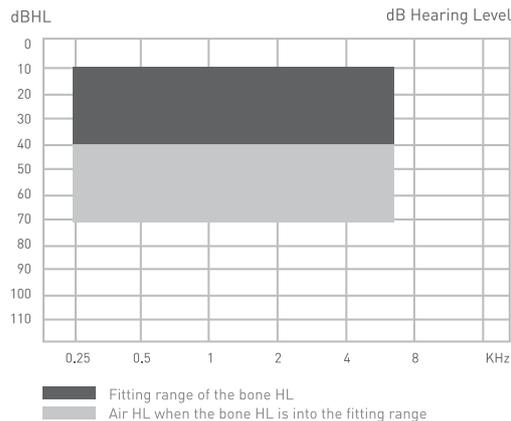


**Power**

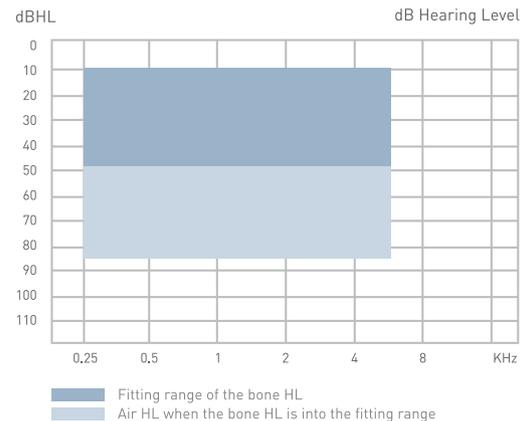
**POWER technology** is a stronger version of the hearing aid's bone conductor.

Thanks to this technology the field of hearing loss types treatable with Melody Flex bone conduction headset is widened, providing the audiologists with a modern instrument more and more precise in the treatment of these kind of pathologies.

## Fitting range comparison



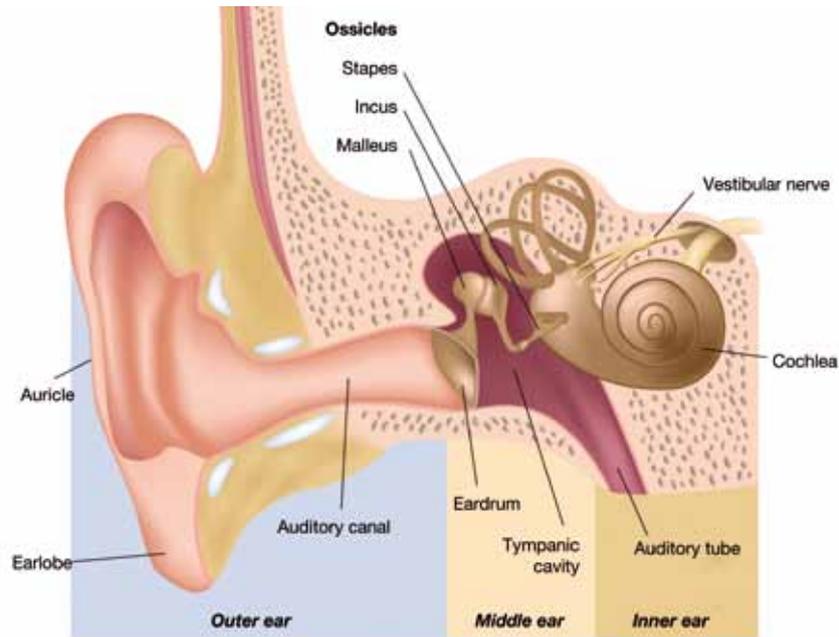
Melody Flex



HL: Hearing Loss

Melody Flex **Power**

# Auditory system



The auditory system receives and converts air pressure changes induced by the passage of a sound wave and transmits it to the auditory system through three constituent parts: the outer ear, middle ear and inner ear.

The external auditory meatus (EAM) has the task of amplifying the sounds in the frequencies ranging between 2 and 4 kHz, improving the discrimination of speech in noisy environments present on low frequencies. The EAM also plays a protective role with regards to the tympanic membrane (eardrum) defending it from external mechanical and traumatic agents.

The inner ear is composed of the cochlea and labyrinth. The cochlea is a spiral-shaped cavity containing liquid, with hair cells and is designed to encode mechanical wave signals as auditory nerve impulses.

The labyrinth specializes in capturing the smallest differences in posture that help to keep our body in perfect balance. The middle ear is found between the outer and inner ear.

The outer ear is separated from the EAM by the tympanic membrane. Accommodated in the cavity there are three tiny bones known as the ossicles: hammer, anvil and stirrup, which constitute, together, the ossicular chain.

The tympanum-ossicular system allows the transmission of sound from the EAM to the cochlea, acting as a transformer, joining two sources, air and liquid, with different impedance limiting the dispersion problem. The tympanum-ossicular system also works as a phase differentiator between sound waves reaching the oval cavity and those reaching the round cavity.

## Different types of hearing loss

We can distinguish different types of hearing loss which result from damage to one or more parts of the ear:

- Sensorineural hearing loss due to problems related to the cochlea and auditory nerve
- Mixed hearing loss caused by the combination of transmission and neurosensory factors
- Conductive hearing loss

We define conductive or transmission hearing loss as that occurring when the sound stimulus cannot reach the auditory cells for purely mechanical reasons, caused by:

- Otosclerosis
- After radical surgery to the middle ear
- Chronic otitis
- For infectious or inflammatory processes of the outer ear
- In the presence of dermatitis
- In the event of a perforated eardrum
- Malformation of the ear

The amount of hearing loss due to a conductive problem may not exceed 70 db.

## How does the bone conduction hearing aid work

A bone conduction hearing aid allows the patient to hear skipping the middle and the external areas of the ear.

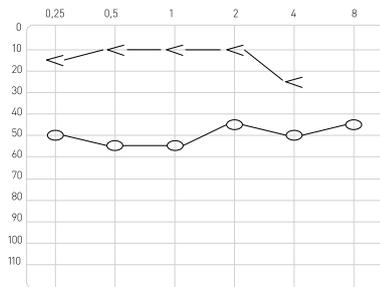
The microphone captures the sound, the internal circuit amplifies it and the bone conductor transforms it into mechanical vibrations.

The vibrations are then sent to the mastoid bone and consequently to the internal area of the ear where they are transformed into nervous impulses, perceived by the brain as sounds.

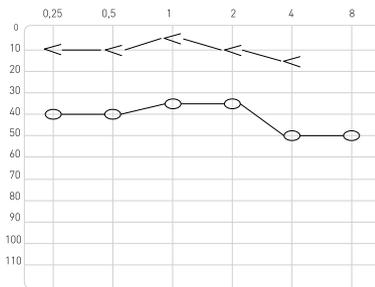
The bone conduction hearing aid represents an effective treatment for a number of hearing loss cases due to:

- Chronic otitis
- Radical middle ear surgery
- Chronic middle ear infection
- Ear inflammation/external ear infection
- Dermatitis
- Eardrum perforation

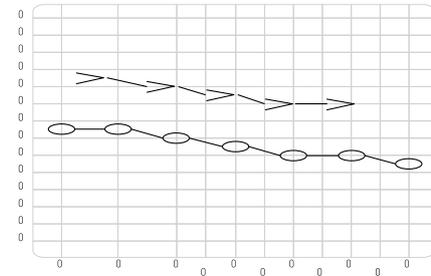
## Bone conduction application cases



Audiogram of an otosclerosis case  
(Hearing Loss)



Audiogram of a chronic otitis  
(Hearing Loss)



Audiogram of a mixed hearing loss

Melody Flex

Melody Flex Power

## The open ear system option as an alternative to ear canal obstruction

The application of an open ear hearing aid avoids several annoyances, such as obstruction, even partial, of the external ear canal, which may cause dissatisfaction for many reasons, such as:

- Variation of ear's natural acoustics, which is the source of acoustic information and sound stimulation (in the 2-3 kHz sound band)
- Excessive amplification of the low frequencies resulting in a feeling of rumble and loss of higher frequencies
- Autophony phenomenon: altered hearing of one's own voice

## The application of bone conduction hearing aid is an effective alternative to implantable hearing aid

The surgical solution is invasive, expensive and has an impact from an aesthetic point of view and it is also not reversible.

	Bone application	Semi-implantable application
Sound quality	✓	✓
Appearance	✓	✗
Non obstructive	✓	✓
Non invasive	✓	✗
Price	✓	✗





## Comfortable and elegant

Autel pays great attention to the design of its hearing aids.

Melody Flex, just as all Autel products, is inspired by the traditional excellence of the **Made in Italy**.

It pays attention to every small detail and to the materials so to obtain the highest balance between sound performance and style.



## Personalise it with various colour combinations

With Melody Flex one can personalise the combinations choosing various colour options for the headset's cover and both the hearing aid and bone conductor.



Discover all the possible cromatic variations

For the complete catalogue of all the colour variation available for the headset and for the hearing aid please visit the Melody Flex page on our website [www.autel-italia.it](http://www.autel-italia.it)

**Technical Specification**

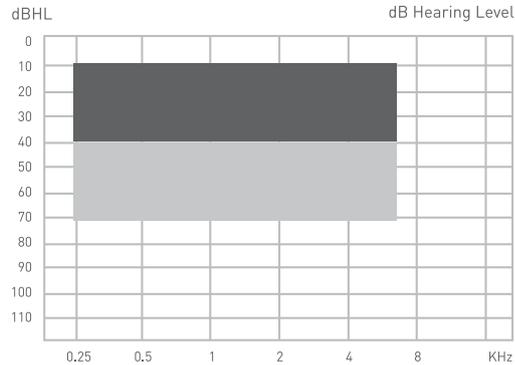
	DGT 3	DGT 4	DSP 1/M	DSP 4/M
Trimmer	3	4	NO	NO
Low tone control	YES	YES	YES	YES
High tone control	NO	YES	YES	YES
Gain control	YES	YES	YES	YES
Volume control	YES	YES	YES	YES
Power control	YES	YES	YES	YES
M-T switch	YES	YES	YES	YES
High GSM immune microphone	YES	YES	YES	YES
Acoustic warning for low battery	YES	YES	YES	YES

**DGT** Digital programmable with trimmers  
**DSP** Digital programmable using AUTEL software

	Melody Flex	Melody Flex Power 
<b>Output force level max</b>		
Peak	108 dB rel.1 $\mu$ N	115 dB rel.1 $\mu$ N
1.600 Hz	96 dB rel.1 $\mu$ N	103 dB rel.1 $\mu$ N
<b>Mechanical-acoustic sensitivity level (AMSL)</b>		
Peak	37 dB	48 dB
1.600 Hz	26 dB	35 dB
<b>Mechanical-acoustic sensitivity level (RTG)</b>	21 dB	30 dB
<b>Frequency range</b>	250 Hz 5000 Hz	250 Hz 4500 Hz
<b>Equivalent input noise level</b>	28 dB rel.1 $\mu$ N	35 dB rel.1 $\mu$ N
<b>Maximum coil sensitivity</b> (10mA/m)	67 dB rel.1 $\mu$ N	79 dB rel.1 $\mu$ N
<b>THD Total harmonic distortion</b> ( 500 / 800 / 1600 Hz )	< 2,5 / 0,2 / 0,1 %	< 2,5 / 0,2 / 0,1 %
<b>Battery current</b>	< 1,6 mA	< 1,5 mA
<b>Battery type (Zinc-air)</b>	675	675
<b>Average battery life</b>	@ 310 h	@ 310 h
<b>Reference test frequency</b>	1600 Hz	1600 Hz

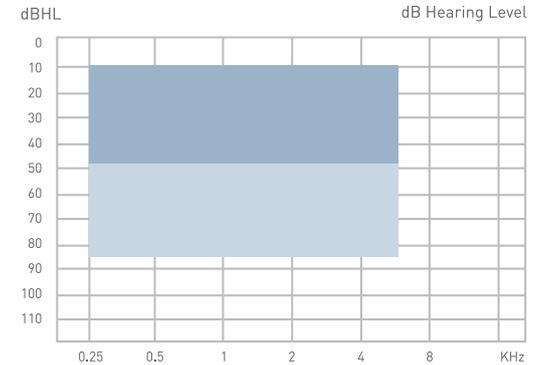
## Fitting Range

### Melody Flex



■ Fitting range of the bone HL  
■ Air HL when the bone HL is into the fitting range

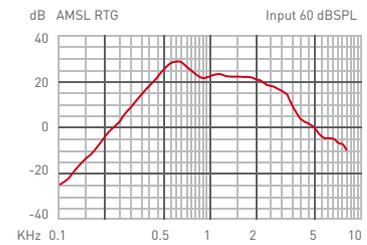
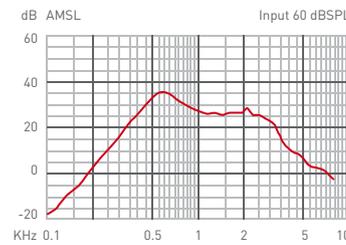
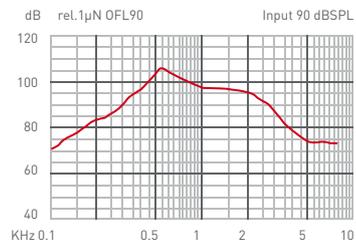
### Melody Flex Power



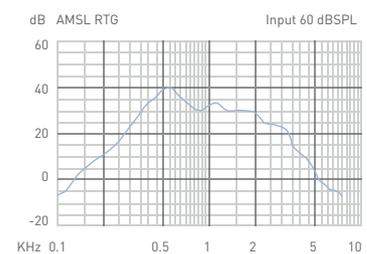
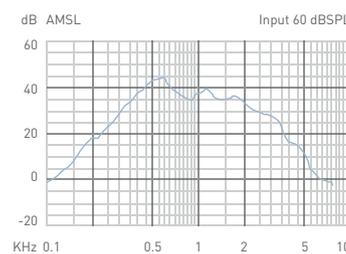
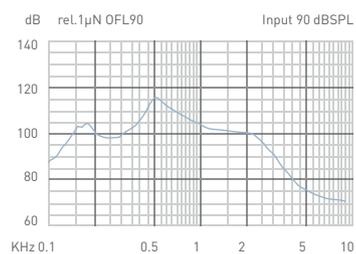
■ Fitting range of the bone HL  
■ Air HL when the bone HL is into the fitting range

HL: Hearing Loss

## Melody Flex



## Melody Flex Power



MEASURING CONDITIONS  
Individual patient results may vary.

CEI 29-13 (IEC118-9)  
Artificial mastoid type: B&K 4930

Environmental conditions:  
T = 23° +/- 5°  
RH = 40-80%  
PA = 101,3 kPa

Operating voltage: 1,3 Volts

Tolerances:  
+/- 4 dB up to 2kHz  
+/- 6 dB up to 4kHz



**Melody Flex** is a product of **Autel S.r.l.**

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