

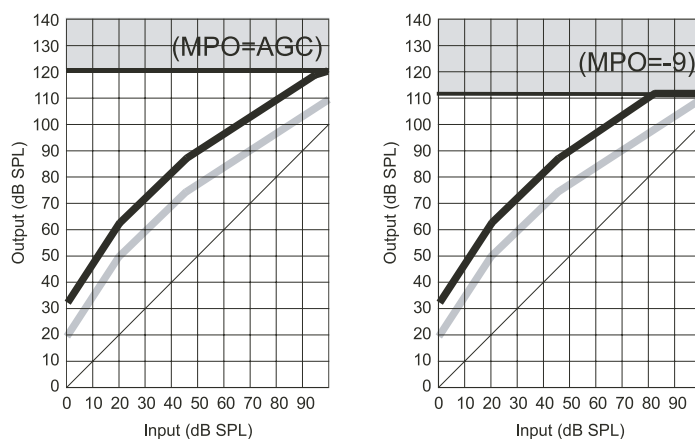


Audiological Bulletin No. 1

General information about Bravo

How does the MPO control on Bravo hearing aids work?

The MPO control on Bravo hearing aids is a true Maximum Power Output control, on which the maximum output of Bravo can be set. Originally, the MPO is set to 'AGC', see the figure to the left. If the output level is lower than the MPO level, the MPO control will not affect the sound. This will be the case at low input levels or when Bravo is set to a mild to moderate hearing loss.



The above figures show the I/O curve in the high band for a mild to moderate hearing loss (45 dB / grey curve) and for a moderate to severe hearing loss (65 dB / black curve). On the figure to the left, the MPO control has not been adjusted but on the figure to the right, it is set to -9 dB, which corresponds to the maximum reduction of the MPO level. As it can be seen, this drastic change of the MPO only has influence on the extensive hearing loss and only as regards the loudest input sounds. The reason for this is that in Bravo, there is already a considerable compression for loud input sounds and that additional reduction is therefore rarely necessary.

Bravo B2 – placement of crossover frequencies

Bravo B2 models have a variable crossover frequency. The four keyed-in audiogram values determine the crossover frequency between the LF and HF channel within the 1000- 2000 Hz range. The crossover frequency is computed in such a way that the two filters, as far as possible, give the characteristic specified by the fitting rationale. Here are some very simple guidelines for the placement of crossover frequencies:

- A slightly sloping hearing loss gives a crossover frequency of around 1500 Hz
- A more steeply sloping hearing loss gives a crossover frequency of above 1500 Hz (2000 Hz as a maximum).
- A flat hearing loss, crossover frequency = 1300 Hz
- A reverse slope hearing loss gives a crossover frequency of below 1500 Hz (1000 Hz as a minimum).



Some questions and answers about Bravo

In connection with the launch of Bravo we have received some questions about Bravo's function. As the answers may be of general interest we list them below:

Q: What are the slopes (dB/octave) of the filters in Bravo.
Are they the same for B1 and B2?

A: Bravo has fixed filter slopes.
The steepness is 24 dB/octave for both B1 and B2.

Q: What are the attack and release times used in Bravo?

A: The attack time is approx. 20 ms and the release time is approx. 200 ms.

Q: What compression thresholds are used in Bravo?

A: The compression thresholds are 53 and 43 dB HL for Bravo 1 in the LF and HF channel, respectively. In Bravo 2 the LF compression threshold is lowered by 17 dB relative to Bravo 1.

Performance rating for Bravo vs Senso Diva and linear hearing aids

Sound environment	Linear hearing aids	Bravo	Diva
Listening to speech in <i>quiet</i> ¹ surroundings	*****	*****	*****
Listening to loud <i>speech</i> ²	**	****	*****
Listening to soft <i>speech</i> ³	**	** (*) ⁴	*****
Monitoring own <i>voice</i> ⁵	*	***	*****
Listening to speech in <i>noisy</i> ⁶ situations	**	***	*****
<i>Telephone</i> ⁷ use	**	***	*****
Weak sound in quiet <i>surroundings</i> ⁸	*	** (*)	*****
Listening to <i>music</i> ⁹	***	***	*****
Tolerating <i>noisy</i> ¹⁰ situations	*	***	*****
Circuit <i>noise</i> ¹¹	***	*****	*****
Overall sound quality	***	*****	*****
Suitability for <i>children</i> ¹²	*	***	*****
Fitting flexibility	*	** (*)	*****
Fine-tuning possibilities	*	**	*****

(Footnotes)

¹ Here, the three hearing aids will give practically the same performance.

² Diva features separate fine tuning for loud inputs, Bravo uses MPO adjustment, which is common to both channels.

³ Diva has the possibility of a high amount of gain due to Feedback Cancelling, Bravo 2 features low level compression.

⁴ (*) applies to Bravo 2.

⁵ Diva is provided with Occlusion Manager permitting optimisation of the reproduction of own voice.

⁶ Diva features Locator and Noise Reduction/Speech Intensification, Bravo features high level compression in 2 bands.

⁷ Diva is provided with Feedback Cancelling, Bravo with high level compression.

⁸ Diva has lower compression thresholds for narrow-band sound than Bravo.

⁹ Bravo is set to reproduction of speech, Diva is provided with a music program.

¹⁰ Diva features Locator and Noise Reduction/Speech Intensification, Bravo features high level compression in 2 bands.

¹¹ Both Diva and Bravo feature microphone noise squelch.

¹² Bravo is not provided with Sensogram, nor Feedback Cancelling.