

Senso Vita élan 100% digital open fit BTE

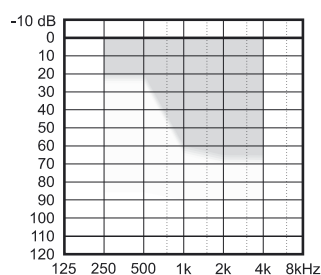
- Sound Harmony™
- EDRC with Sound Stabilizer
- “Quiet” and “Noise” listening programs
- SoundSelector
- Noise Manager
- Feedback Manager
- Sensogram in 4 bands
- Instant fitting with élan ear-set



Recommended for:

- Mild to moderate hearing loss
- High frequency hearing loss

Suggested fitting range:



Senso Vita élan is a 100% digital open fit hearing aid combining proven technology with new and innovative features and strategies.

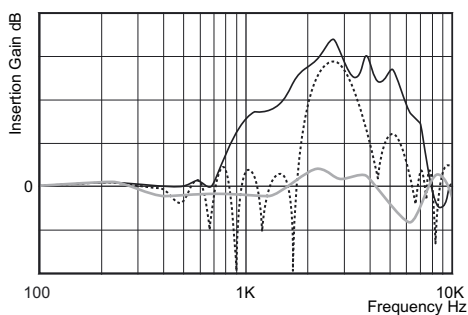
- Sound Harmony – a unique signal processing method to harmonise the effect of the amplified sound and the direct sound in the ear canal. This ensures adequate gain and good sound quality
- EDRC with a low compression threshold at 20 dB HL
- OptiSlope algorithm to automatically calculate appropriate crossover frequencies
- Sound Stabilizer combines advantages of fast and slow regulation times to ensure audibility and natural sound quality
- SoundSelector – omnidirectional and directional microphone in one
- Noise Manager – dynamic gain adjustment in all active channels for increased listening comfort and focus on speech in noise
- Feedback Manager with automatic feedback test to minimise whistling in most environments
- Sensogram – in-situ threshold measurement in 4 frequency bands for maximum fitting precision
- 2 listening programs dedicated for quiet and noisy environments
- MT and T programs with adjustable telecoil sensitivity and anti-hum filter. 2 additional DAI programs with automatic detection of audio shoe and adjustable DAI sensitivity
- Wide range of programmable parameters
- Easy programming with NOAH/Compass or the SP3 dedicated programmer
- Optional volume control
- Beep-tone indicator for volume adjustment, program shift and low battery
- EcoTech technology minimises power consumption
- QualiTech – sound quality enhancing features
- 2 MHz/1 bit sigma-delta converters
- 32 kHz/20 bit processing
- The élan open fit ear-set provides maximum comfort through a high degree of individualisation and discretion

The Senso Vita élan sound systems

Senso Vita élan is divided into four functional systems each addressing one of four basic design objectives: to ensure ease of listening, ease of communication, ease of customisation and ease of use. Several features contribute to each system.

SoundShape System

Sound Harmony™



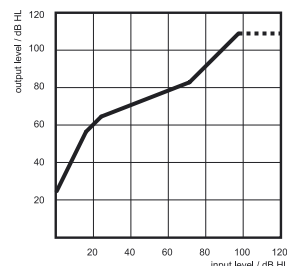
Sound Harmony is a signal processing method designed to address the various issues that are a consequence of an open fitting. An open fitting will result in some of the amplified sound filtering out of the ear canal, resulting in a lower sound pressure level at the eardrum. Consequently, extra amplification is required. Also, the hearing aid must compensate for a different ear canal resonance dictated by the open fitting (grey curve in illustration) and not the traditional closed ear canal resonance. Another issue is the combination of direct and amplified sound. If these are added out of phase, dips will be seen on the frequency response (dotted curve) and the perceived sound quality deteriorates.

Sound Harmony is designed to compensate for all of these effects (black curve), by ensuring that adequate amplification and good sound quality are realized in the open fitting.

Sound Stabilizer

The Sound Stabilizer controls the regulation speed using an adaptive strategy. Predominantly slow regulation in stable environments results in a natural sound reproduction. Fast adaptation to changes in the acoustic environment ensures audibility in all situations.

Enhanced Dynamic Range Compression



Compression over a wide input range. A very low compression threshold (20 dB HL) ensures sufficient amplification to raise soft sounds (including soft speech) above the user's threshold. Speech is amplified to a comfortable level, while gain is reduced for loud sounds to minimise distortion and discomfort.

The compression characteristic for each channel and the position of the crossover frequencies are automatically calculated based on in-situ threshold information.

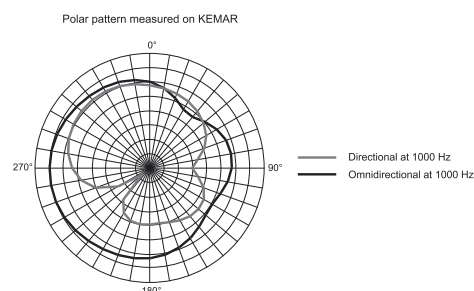
EDRC is applied in the mid and high frequencies to compensate for hearing loss and recruitment. In the low frequencies the hearing aid user is listening to the direct sound through the open fit élan ear-set.

Noise Manager with Comfort Shaping

The Noise Manager with Comfort Shaping identifies noise based on a statistical analysis in all active channels. Whenever loud noise dominates the listening environment, gain will be reduced in the affected channels to increase listening comfort.

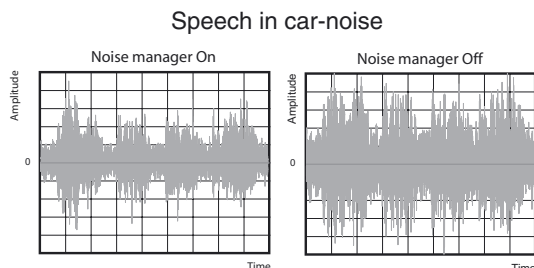
SoundFocus System

SoundSelector



A new microphone design combines an omnidirectional and a directional microphone in one small unit. The user can select which microphone mode to use in a specific situation by selecting one of the dedicated listening programs (Quiet or Noise).

Noise Manager with Speech Focus



The Noise Manager with Speech Focus identifies the presence and level of noise and speech in all active channels based on a statistical analysis. Whenever noise dominates in a channel, gain will be reduced to minimise the masking effect. Whenever speech dominates, gain will be increased in the frequency regions important for speech understanding.

Listening programs

Senso Vita élan has up to 6 different listening programs. The program button on the hearing aid will allow the user to toggle between programs. The program combination can be modified using Compass.

The 'Quiet' program is dedicated for listening in conditions without competing noise. This includes listening to music. The microphone will be set to an omnidirectional mode, the Sound Stabilizer is defaulted to On, and the degree of activity for the Noise Manager can be adjusted (default: Full).

The 'Noise' program is optimised for listening in noisy situations. The microphone will be set to a directional mode, the Sound Stabilizer is defaulted to Off, and the degree of activity for the Noise Manager can be adjusted (default: Full). The overall gain for the 'Noise' program can be adjusted +15/-16 dB relative to the 'Quiet' program using the *Noise program gain* parameter in Compass.

Senso Vita élan is equipped with an efficient telecoil which can be used in combination with the microphone (MT program) or alone (T program). The telecoil is equalised to provide the same response as the microphone. An anti-hum filter reduces interference from the mains. The sensitivity of the telecoil can be adjusted using the *Tele program gain* parameter in Compass (adjustment from -12 to +10.5 dB).

The Direct Audio Input goes through a separate A/D converter. This means that it will not influence the sound quality of the microphone. Also, DAI sensitivity can be

adjusted separately to achieve proper balance between the microphone input and the Direct Audio Input using the *DAI program gain* parameter in Compass (adjustment range -12 to +10.5 dB). M-DAI and DAI programs automatically replace the MT and T programs when an audio shoe is connected to the hearing aid (Note: a program combination including the MT and T programs must be selected during programming in order to have access to the DAI programs).

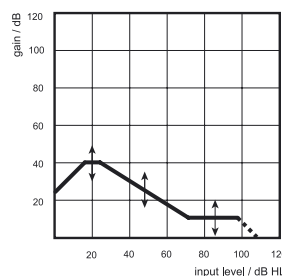
SoundControl System

Fitting parameters

The Sensogram is one of the most efficient and precise fitting methods available. By using the hearing aid as a miniature audiometer, in-situ thresholds of the client can be measured with the élan ear-set. Sensogram thresholds are measured in four frequency bands centred at 500, 1000, 2000 and 4000 Hz using pulsed tone complexes.

The automatic feedback test serves to evaluate the fit of the selected élan ear-set in order to set the parameters of the Feedback Manager. The Feedback Manager controls the amplification characteristic in each channel in order to minimise the risk of feedback.

Fine tuning parameters



Insertion gain can be adjusted for three input ranges (Soft, Normal and Loud) in all active channels. The three input ranges correspond to three distinct segments on the input/output curve. A Master Gain parameter allows simultaneous adjustment of overall gain.

Programmable options

A wide range of options can be modified using Compass or the SP3 programmer (options marked with * are adjustable in Compass only):

- Number of listening programs. *
- Noise Manager activity can be set to *Full* (maximum gain decrease 12 dB per channel), *Half* (maximum gain decrease 6 dB per channel) or *Off*. Degree of activity can be set independently for the 'Quiet' and 'Noise' programs.
- Sound Stabilizer can be set to *On* or *Off* independently for the 'Quiet' and 'Noise' programs.
- Noise program gain can be adjusted +15/-16 dB relative to the 'Quiet' program. *
- Telecoil sensitivity can be adjusted using the *Tele program gain* parameter (adjustment ranges from -12 to +10.5 dB). *
- DAI sensitivity can be adjusted relative to the 'Quiet' program using the *DAI program gain* parameter (adjustment ranges from -12 to +10.5 dB). *
- Crossover frequencies are automatically calculated based on Sensogram information, but can also be manually locked to 600/1800, 850/2600 or 1200/3700 Hz.
- Automatic Output Control (On/Off).
- Volume control (On/Off).

The élan open fit ear-set

The élan ear-set is a combination of unique elements designed especially for élan instruments to deliver the sound from the hearing aid into the user's ear as comfortably and discreetly as possible. The ear-set consists of an integrated earhook and sound tube available in three lengths, a small, soft é-tip, available in four sizes to keep the sound tube comfortably in position without plugging the ear canal, and a flexible anchor to keep the élan ear set and the é-tip securely in place.

Senso Vita élan signal processing is designed specifically for use with the élan ear-set.

Accessories

A full range of accessories are available for Senso Vita élan:

- 7 different transparent housings.
- 3 standard colour housings (warm grey, beige and brown).
- Audio shoe (Widex 1) for use with FM, DAI and Bi-CROS applications.
- DAI cables in mono and stereo configurations for connection to audio equipment.
- CROS/BiCROS adaptor with cables in different lengths.
- Colour codes which identify hearing aids as right or left.

Hearing aid options

An optional volume control is available for Senso Vita élan. The adjustment range is +3/-12 dB.



SV-9é

FreeSound System

EcoTech

Several measures have been taken to minimise power consumption:

- EcoDrive is a patented enhancement of the digital DDD/DPD output stage from Widex. It consumes less power than alternative output stages available.
- Automatic Output Control reduces saturation at the output stage and therefore also reduces the current consumption.
- Improved A/D converters with a power-optimised increase of the sampling rate (2 MHz).
- Improved chip technology of smaller geometry – reduces battery drain without sacrificing functionality.

QualiTech

A superior sound quality is ensured by a combination of features:

- Automatic Feedback Manager limits the gain in each of the channels individually so that whistling is avoided.
- Microphone squelch reduces gain below the low kneepoint. This practically eliminates all circuit noise.
- Automatic Output Control reduces distortion of even the loudest sounds.
- Improved A/D converters ensure increased input dynamic range and less distortion of loud inputs.
- Anti-hum filter on the telecoil removes interference from the mains in both 50 Hz and 60 Hz systems.
- High immunity from mobile phone interference.

User friendliness

- Choice between automatic and user-controlled functions.
- Beep-tone indicator for volume adjustment, program shift and low battery at an input-related level of 70 dB SPL.
- A model-specific set of cleaning tools are available to facilitate daily maintenance.

SV-9é

Technical data

	IEC 711 Ear simulator	IEC 126 2cc coupler
OSPL90 Peak	122 dB SPL	112 dB SPL
1 kHz	105 dB SPL	97 dB SPL
HAIC	105 dB SPL	97 dB SPL
Harmonic distortion		
500 Hz	4.5 %	2.7 %
800 Hz	1.1 %	1.6 %
1600 Hz	0.9 %	0.7 %
Battery drain (st.by)	0.70 mA	
Battery drain	0.75 mA	
Battery type 13 Zn-Air (270 mAh)	350 hours	
Telecoil TLS *	+2 dB	

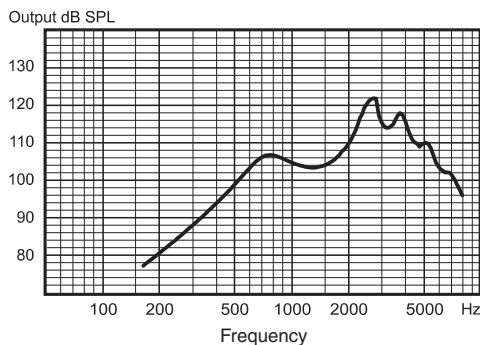
* A telecoil input of 100 mA/m will be equivalent to a microphone input of 70 dB SPL.

Processing data

Sampling rate	32 kHz
Max word length	32 bits
A/D converters	2MHz/1bit sigma-delta
DDD converter	1MHz/1bit sigma-delta
Processing delay	<2msec
Processor type	Dedicated ASIC
Frequency bands	3 bands
Channels	3

MPO data has been measured to reflect the SV-9é output alone.
In real life it will be mixed with direct sound through the ear canal.
Measured through a normal hook and a sealed coupler, the curves will have yet a different shape.

Maximum output (Ear simulator - IEC711)



Maximum output (2cc coupler - IEC126)

