8380A

Operating Manual

Genelec 8380A
Smart Active Monitor

GENELEC®

Genelec 8380A Operating Manual

Introduction

Thank you for choosing Genelec! Fulfilling your dreams by offering the most truthful sound reproduction has been the source of our enthusiasm since 1978. Already over one million Genelec monitors are in use around the world - welcome to our story!

Genelec monitors are designed to last long our spare part support extends far into future. They are hand-built in Iisalmi, Finland, using certified sustainable methods. They are individually tested and calibrated for the highest performance. They have also all been designed for low power consumption in use and in standby.

Please register your monitor at

http://www.community. genelec.com/

and receive an extended five-year warranty for spare parts. For more information about our service and technical support, please visit

http://www.genelec.com/customer-service.

This monitor may cause traumatic and permanent hearing impairment. Read warnings in the operating manual before applying power. Ear protection should be worn at all times when working in the vicinity of a powered system

System

The Genelec 8380A is a three-way monitoring system for medium sized control rooms. It performs well as a free-standing monitor as well as flush-mounted in control room walls. It is suited for recording, film and video post-production, broadcast monitoring as well as for mastering.

The Minimum Diffraction Coaxial™ (MDC™) transducer design implements a coaxial driver with unparalleled acoustic directivity control. A powerful midrange transducer surrounds a high output tweeter transducer, enabling a high resolution response extending to ultrasonic frequencies. The MDC minimizes acoustic diffraction, produces a flat frequency response on the acoustical axis, and a neutral off-axis sound character. The large Directivity Control Waveguide™ (DCW™) contributes to extremely clean off-axis sound character. The minimum listening distance is 1.3 metre, and at a 2 metre listening distance the fast low distortion amplifiers can drive a stereo system to peak sound levels in excess of 124 dB SPL.

The 8380A provides excellent phase matching with other 8300 series monitors, The Ones and The Main Ones, offering precise imaging in mixed-product systems.

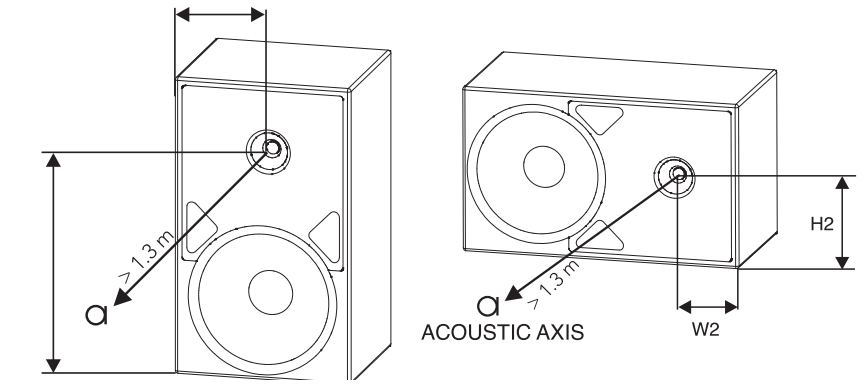
Drivers and Enclosure Construction

The 8380A reproduces low frequencies with a 385 mm (15 in) woofer in a 110 litre bass reflex enclosure. The enclosure is made of MDF. The Minimum Diffraction Coaxial (MDC) midrange/tweeter system consists of a 130 mm (5 in) midrange cone and a 25 mm (1 in) aluminium dome tweeter. The joints between the tweeter, midrange driver and DCW are perfectly smooth and form a contnuous shape.

Amplifiers and Signal Processing

The 8380A uses the RAM-L2 amplifier unit. The RAM-L2 amplifier is mounted with vibration absorbers in the rear of the monitor enclosure, and can also be detached and mounted to a 19 inch rack.

Digital signal processing in the RAM-L2 amplifier unit is done with high precision algorithms, and includes driver and amplifier overload protection. The room response compensations include highly flexible parametric filters, level alignment, and acoustic delay compensation. These allow accurate matching to all console output sections and room acoustics.



	H1 mm (in)	W1 mm (in)	H2 mm (in)	W2 mm (in)
8380A	607 (23 7/8 in)	240 (9 1/2 in)	240 (9 1/2 in)	203 (8 in)

Figure 1. The location of the acoustic axis.

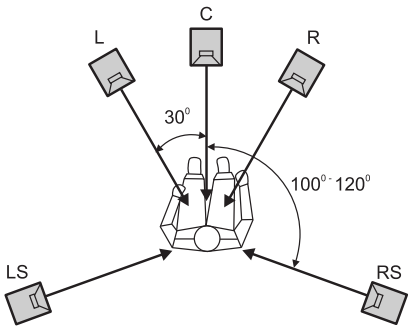


Figure 2. Recommended placement and alignment of monitors in a 5-channel system (ITU-R BS.775-1)

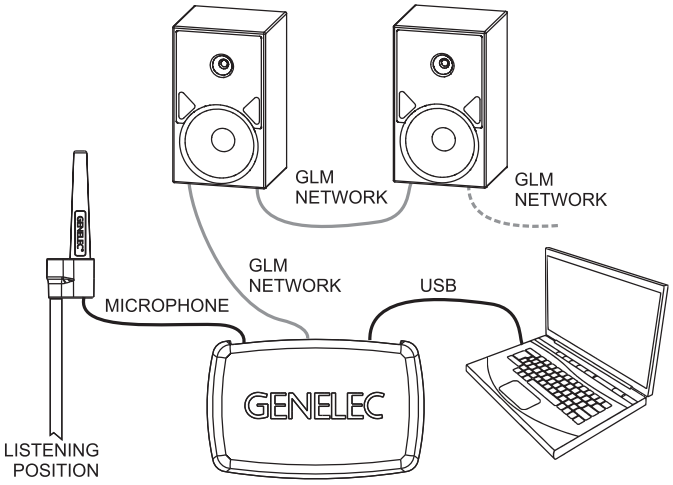


Figure 3. GLM network cabling

Mounting Considerations

This product is designed for indoor use only. The permissible ambient temperature is 15-35 degrees Celsius (50-95°F) and relative humidity 20% to 80% (non-condensing). To prevent condensation after the product has been in a cool environment, wait at least one hour before opening the packaging and connecting the mains power.

Place monitors so that their acoustic axes are aimed towards the listening position (see Figures 1 and 2). Place monitors with left-right symmetry and at an equal distance from the listening position. Acoustic reflections from objects close to monitors and the listening position can cause colouration and blurring of the sound image. Symmetrical positioning of reflective objects maintains good stereo imaging. When soffit (flush) mounting, the wall surface should extend to the monitor, forming a continuous surface.

Minimum Clearances

The minimum clearance is 5 cm (2 in) behind, above and on both sides of the monitor, when the RAM-L2 amplifier is mounted on the enclosure. The ambient temperature around the amplifier must not exceed 35 degrees Celsius (95°F). When soffit mounting, sufficient ventilation should be a arranged behind the monitor. This may require forced ventilation around the RAM-L2 amplifier.

When the RAM-L2 amplifier is mounted in a 19 in rack, the minimum free space is 1U both above and below the amplifier and both sides of the amplifier fully open to enable free movement of air. Use the included rack mount front plate to ensure sufficient space above and below the amplifier.

When mounted on a table, shelf or similar solid horizontal surface, RAM-L2 amplifier must be placed horizontally, as in a 19 in rack. RAM-L2 may never be placed upright or on its perforated ends. The amplifier must be lifted so that there is at least 25 mm (1 in) of free space below it. There must also be a free space of at least 250 mm (10 in) above and 100 mm (4 in) on both sides of the amplifier to ensure convective cooling. Free air flow must be possible in the front side of the amplifier. Amplifiers may not be stacked upon each other.

Unrestricted airflow must be maintained at the front of the amplifier at all times. Stacking multiple amplifiers directly on top of one another is not permitted.

Set-up and Use

Monitor calibration and setup

The 8380A is set up using the GLM software. The setup is fast and consists of the following steps:

1. Run a CAT5 (RJ45) cable from the monitor control network to the next monitor.
2. Run the final cable to control network input of the GLM Adapter device.
3. Connect the GLM Adapter device to your computer USB connector. The cable is a part of the GLM User Kit.
4. Place the Genelec measurement microphone at the listening location of the engineer, on a stand, with the

microphone pointing upwards and the microphone top at the height of the engineers ear in normal working position. The microphone is a part of the GLM User Kit.

5. Run the microphone cable to the microphone input in the GLM Adapter device.
6. Download GLM software at the Genelec web site (www.genelec.com). Install the GLM software.
7. Follow the GLM software instructions to measure and set up your monitors.
8. If you plan to not use a computer for controlling the monitors, use the GLM software to write the setting into the monitors ("Store the Settings").

Audio Inputs

The 8380A inputs support balanced analog line-level audio and AES/EBU digital audio. At maximum sensitivity, -6 dBu analog and -30 dBFS digital audio signals produce 100 dB SPL level at one metre distance in free space.

The analog input is selected when a digital signal is not present. The digital input is selected automatically when a digital signal is present even when the signal is silent. The GLM software can select either input.

An AES/EBU digital audio signal carries two channels in one cable. A channel is selected using the GLM software. The DIGITAL OUT carries an unaltered copy of the input, enabling daisy-chaining of up to four monitors.

RAM-L2 Amplifier Power Button

A short press of the power button turns RAM-L2 on or off. Turning on, the power button light flashes rapidly, and lights on steadily when the turn-on has been completed.

A long press on the button (over 5 seconds) resets the monitor to factory settings (see Table 3).

Setting ISS™

The Intelligent Signal Sensing (ISS) puts the monitor to a power-saving stand-by mode automatically. The factory setting for ISS is "OFF." The ISS can be activated using the GLM software. When ISS is active, if no audio signal is sensed during the selected time, the monitor powers down. The monitor will power up again once a signal is detected. The ISS setting is applied to all ISS-enabled monitors in the currently selected Setup.

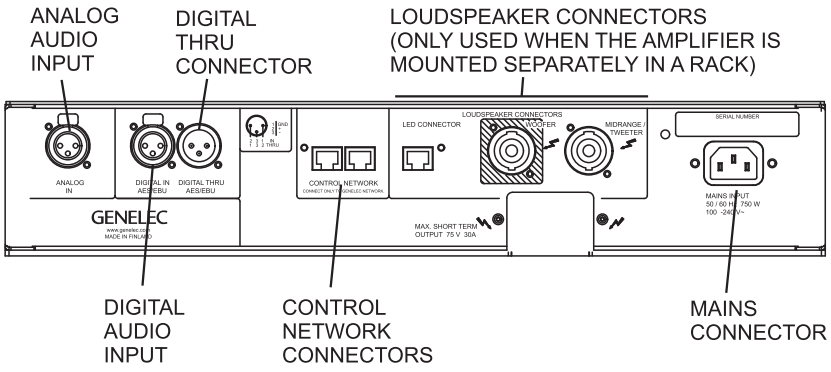


Figure 4. Connector panel of the RAM-L2 amplifier.

Colour	Indication
Solid green	Normal state, normal operation
Blinking green	GLM is interrogating the monitor
Blinking green every 10 sec.	Monitor is in an ISS power saving sleep state
Blinking red	Power amplifier overload protection is active (audio is modified because of protection)
Solid red	Monitor is muted
Solid yellow	Monitor is not in the active (playing) group
Blinking yellow	Overheat protection is active (audio is modified because of protection)

Table 1. Front panel light modes.

Connections

"MAINS INPUT" Connector

Connect to the mains supply.

"DIGITAL IN AES/EBU" Connector

The monitor defaults to reproducing an analog input signal. The digital audio AES/EBU input is selected automatically when a valid digital audio signal is presented. Use GLM software to define the AES/EBU subframe to monitor.

"DIGITAL THRU AES/EBU" Connector

This output carries an unaltered copy of the digital audio signal and can be used for daisy-chaining the signal up to three additional SAM monitors or subwoofers.

"ANALOG IN" Connector

The maximum input level of the analog input is +25.0 dBu. The analog input must not be overloaded, otherwise distortion will result. When the maximum input is exceeded, the enclosure front panel light turns red, indicating the overload.

Cable gauge	Max. length
2.0 mm^2 (14 AWG)	30 m (100 ft)
3.3 mm^2 (12 AWG)	40 m (130 ft)
5.3 mm^2 (10 AWG)	60 m (200 ft)

Table 2. Minimum cable thicknesses for different lengths of signal cable

The sensitivity of the monitor system is set using the GLM software. Coming from the factory, the analog input is set to the highest sensitivity, resulting in a sound output of 100 dB SPL for a -6 dBu analog input signal.

"CONTROL NETWORK" Connectors

The RJ-45 sockets connect the monitor to the proprietary Genelec Loudspeaker Manager™ (GLM™) network. Do not connect to Ethernet LAN.

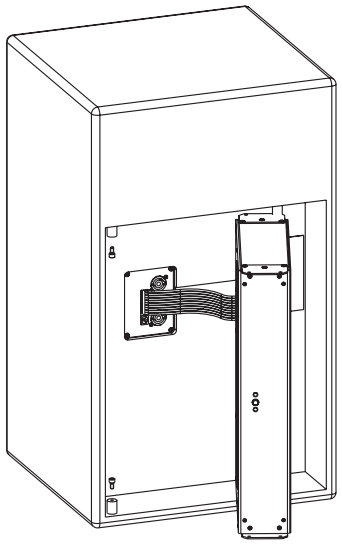


Figure 6. Pull out the left side of the amplifier and detach the flat cable from the enclosure.

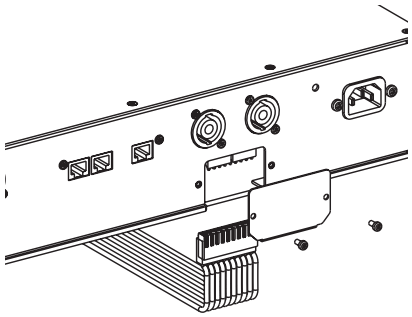


Figure 7. Remove the flat cable cover plate and detach the flat cable connector. Replace the cover plate.

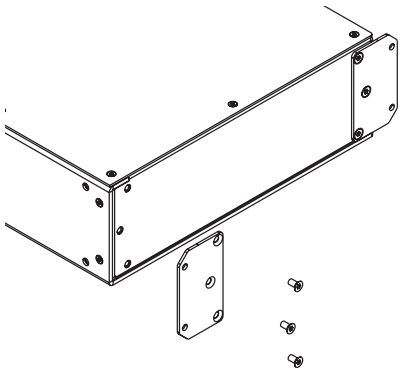


Figure 8. Remove the front mounting ears.

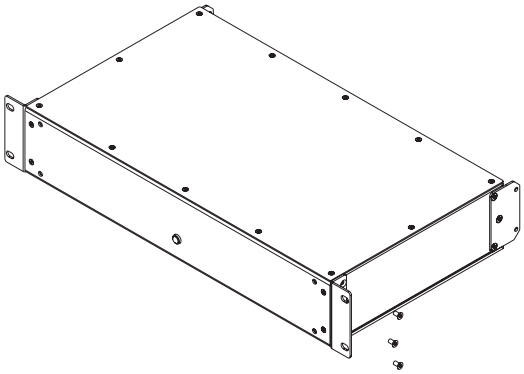


Figure 9. Attach the angled rack mount ears.

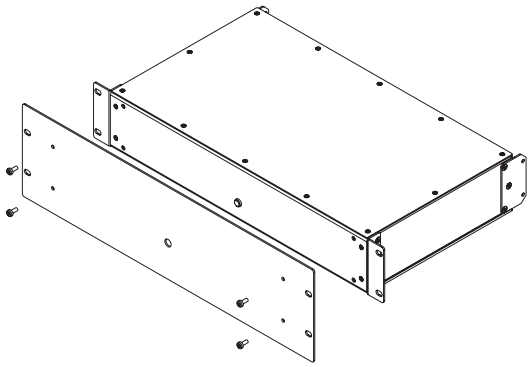


Figure 10. Attach the front plate.

“Loudspeaker Connectors” Group

These connectors are used when the RAM-L2 amplifier is mounted separately in an equipment rack.

1. “LED” Connector
   This RJ-45 socket is a connection for the front panel warning LED.
2. “Woofer” Connector
   A standard four-pole Speakon cable connects to the woofer.
3. Midrange/Tweeter” Connector
   A standard four-pole Speakon cable connects to the coaxial midrange and tweeter.

Front Panel Light Functions

Green light on the DCW panel of a 8380A enclosure indicates normal operation. See Table 1 for other light modes and their causes.

Mounting RAM-L2 Amplifier in a 19 Inch Rack

The RAM-L2 amplifier can be removed from the enclosure and installed in a standard 19 inch rack. The rack mount components (front plate, brackets, screws) are included with the monitor.

For each monitor you need two four-pole Speakon cables (pin-to-pin, all pins connected) and a RJ45 cable of suitable length to go between the amplifier and the monitor enclosure. These are not included in the monitor package. See Table 2 for minimum necessary cable gauges for different lengths of cable.

RAM-L2 amplifiers are factory calibrated with the monitor enclosure they are shipped with. Be very careful not to mix the amplifier/enclosure pairs.

Preparation for rack mounting is done with the following process:

1. Remove all signal cables and the mains cable from the amplifier.
2. Remove the two screws attaching the amplifier to the vibration isolating mounts at the left top and bottom.
3. Pull out the left side of the amplifier (see figure 6).
4. Detach the flat cable from the enclosure.
5. Undo the two screws on the right side isolating mounts. Remove the amplifier.
6. Remove the cover plate of the flat cable connector (see figure 7). This cover,

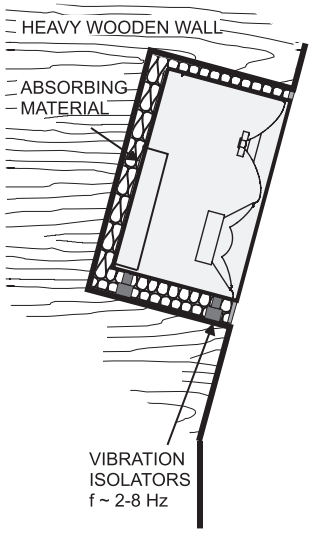


Figure 11. Flush mounting the monitorin a wall constructed of wood

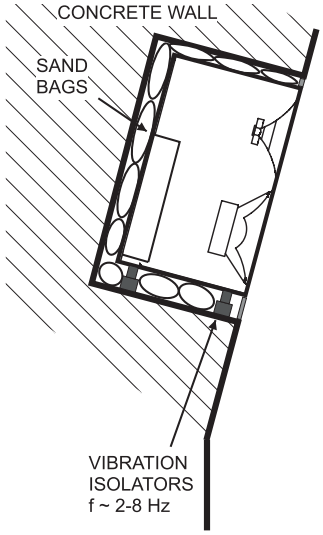


Figure 12. Flush mounting the monitor in a wall constructed of concrete

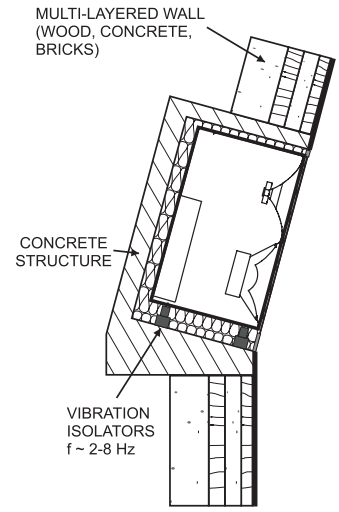


Figure 13. Flush mounting the monitor in a wall constructed of a combination of materials.

Button press	Function	Notes
Short press	Power on, power off	
Long press	Revert to factory settings	Press longer than 5 seconds

Table 2. Power button actions

marked "DIRECT LOUDSPEAKER CONNECTOR" is replaced by the "FOR REMOTE AMPLIFIER USE" cover plate included in the 8380A package when the amplifier is removed from the monitor enclosure.

7. Pull out (detach) the flat cable from the amplifier unit.
8. Attach the "FOR REMOTE AMPLIFIER USE" cover plate on the flat cable connector.
9. Remove the front mounting ears (see figure 8).
10. Attach two angled rack mount brackets (included). Attach the front plate (included) (see figures 9 and 10).
11. Attach the amplifier to a 19 inch rack.
12. Remove the plastic cover from the RJ45 connector. Attach two Speakon cables, and one RJ45 cable (LED CONNECTOR) between the amplifier and the enclosure.
13. Attach signal cables and the mains cable.

Flush Mounting the Monitor Enclosure

Flush mounting offers acoustical benefits. No enclosure edge diffraction will occur. Low frequency reflections from the wall behind the monitor can be avoided. The monitor's acoustical axis (Figure 1) should point to the listening position. The wall in which the monitors are mounted should be stiff and heavy. The monitors should not be mounted too high (maximum tilt angle < 15 degrees).

A space 50 to 100 mm (2 to 4") wide can be left around the monitor but this space should be covered with a panel in the front. Leave a gap of 5 to 10 mm (¼ to ½") between the monitor and the panel. Fill this gap with a soft rubber gasket (see figure 14). The monitor should be mounted on vibration isolators. The resonant frequency of movement for the mounted monitor should be between 2 to 8 Hz.

An empty cavity in the wall should be filled with absorbent mineral wool or foam plastic. A wooden wall structure must be heavily braced (see figure 11). In a solid (e.g. concrete) wall structure, the space around the enclosure should be filled with absorbent mineral wool or sand bags (see Figure 12).

Ensure that the enclosure is flush with the surface of the wall. If a decorative cloth frame is used the edges adjacent to the monitors must be less than 20 mm (3/4 in) deep. The cloth must be acoustically transparent.

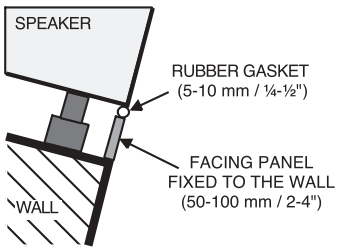


Figure 14. Covering the gap between the wall and the monitor enclosure.

Symbols


WEEE Directive 2012/19/EU


Power/standby switch


IEC 60417-6044 symbol

Safety Considerations

The 8380A monitor is capable of playing sound levels significantly in excess of 100 dB SPL. The monitor may cause traumatic and permanent hearing damage from even a single, short duration incident. Sound exposure level per week (normalized to 40 hours), and per day (normalized to 8 hours), should be limited to 80 dB to reduce the risk of hearing damage. Precautions must be taken to prevent unwanted or accidental

Setting	Value
Level compensation	0 dB (nominal sensitivity)
Digital input sensitivity	0 dB (nominal sensitivity)
Room calibration filter gains	0 dB (no effect)
Extended Phase Linearity	OFF
Input selection	Automatic
Time of flight delay	0 ms
Bass management filter	Full band
ISS delay	Never sleep
ISS sensitivity	High
Extra gain	OFF
System start-up level	0 dBFS (maximum sensitivity)
System level restriction	None
Digital input subframes selected	A+B

Table 3. Factory settings

excessive sound levels, and hearing protection should be always worn when working in the vicinity of a powered system.

Genelec recommends that the sound exposure of the personnel operating the 8381A system does not exceed the limits set out in the noise at work directive by the European Commission, Directive 2003/10/EC. In case local requirements are more conservative, the more conservative limits should be observed.

Although 8380A has been designed in accordance with international safety standards, to ensure safe operation and to maintain the monitor under safe operating conditions, the following warnings and precautions must be observed:

WARNING!

The Genelec 8380A monitors are capable of producing sound pressure levels in excess of 85 dB, which may cause permanent hearing damage.

Maintenance

No user serviceable parts are to be found within the monitor enclosure or the RAM-L2 amplifier unit. Any maintenance or repair of the monitor should only be undertaken by qualified service personnel.

Guarantee

Genelec 8380A is supplied with a two year guarantee against manufacturing faults or defects that might alter the performance of the monitors. You can get an additional three-year guarantee covering spare part costs by registering your product at www.genelec.com. Refer to supplier for full sales and guarantee terms.

Accessories

A wide selection of accessories is available for Genelec monitors. Consult the Accessories Catalogue on www.genelec.com or your local distributor/dealer for up-to-date information.

Compliance to FCC Rules

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

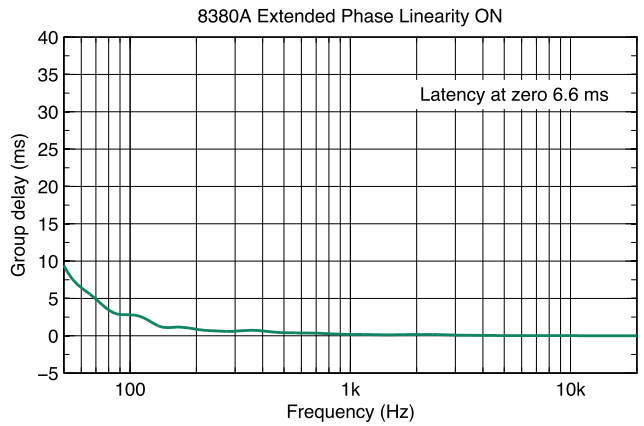


Figure 15. 8380A group delay with Extended Phase Linearity ON

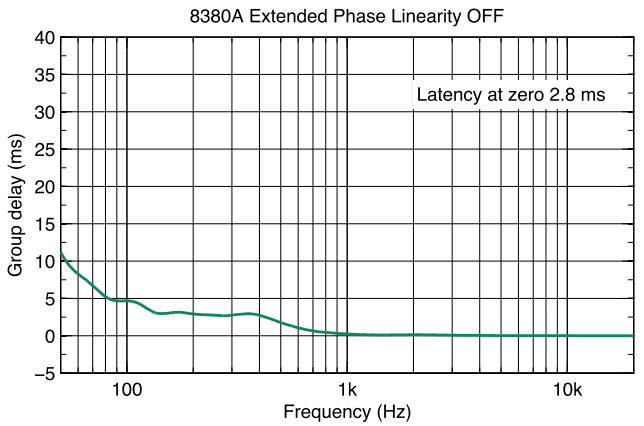


Figure 16. 8380A group delay with Extended Phase Linearity OFF

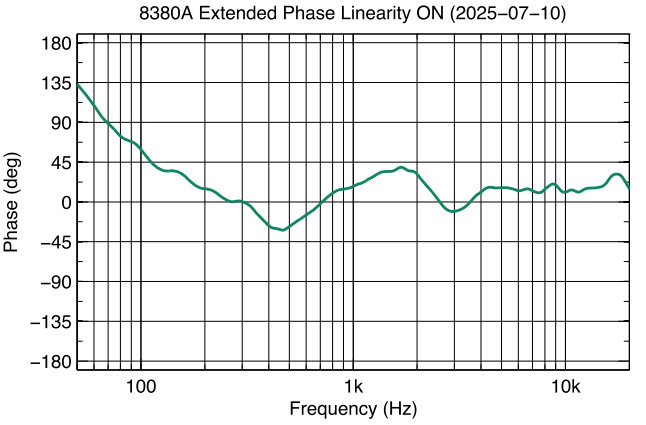


Figure 17. 8380A group delay with Extended Phase Linearity ON

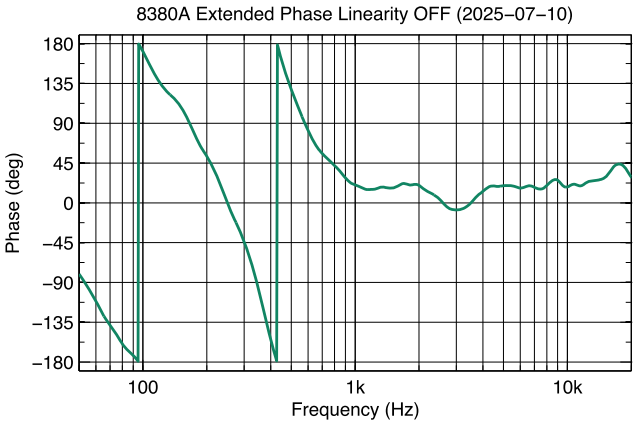


Figure 18. 8380A group delay with Extended Phase Linearity OFF

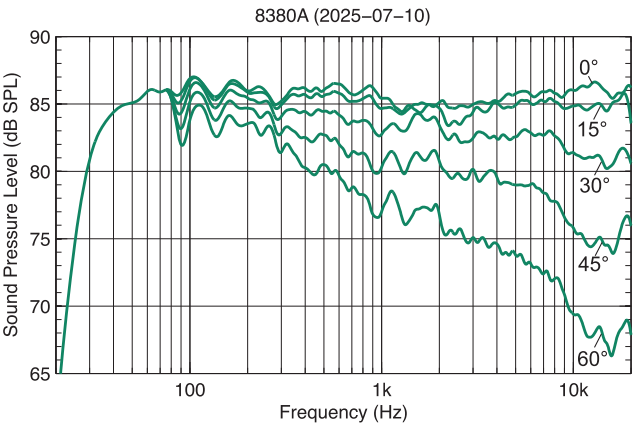


Figure 19. The curve group shows the horizontal directivity characteristics of the 8380A in its vertical configuration measured at 2 m.

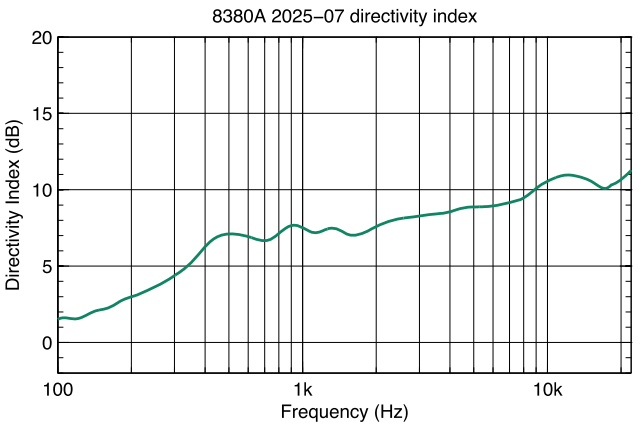


Figure 20. The curve above shows the directivity index of the 8380A.

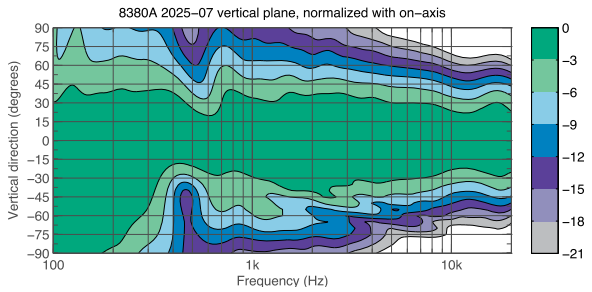


Figure 21. 8380A vertical directivity plot.

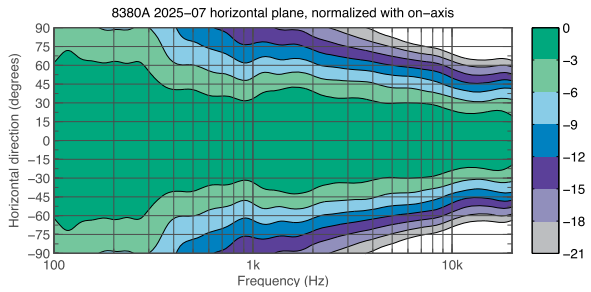


Figure 22. 8380A horizontal directivity plot.

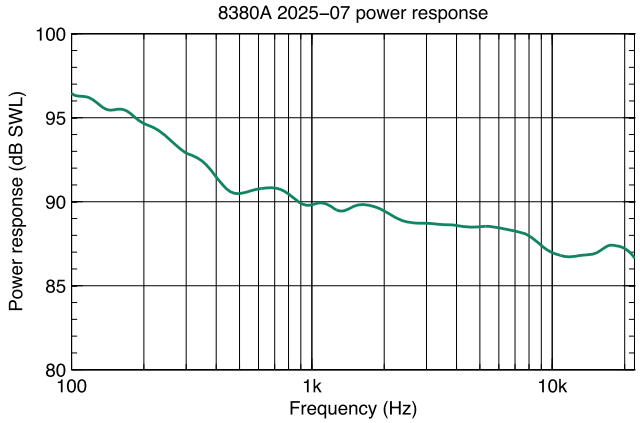
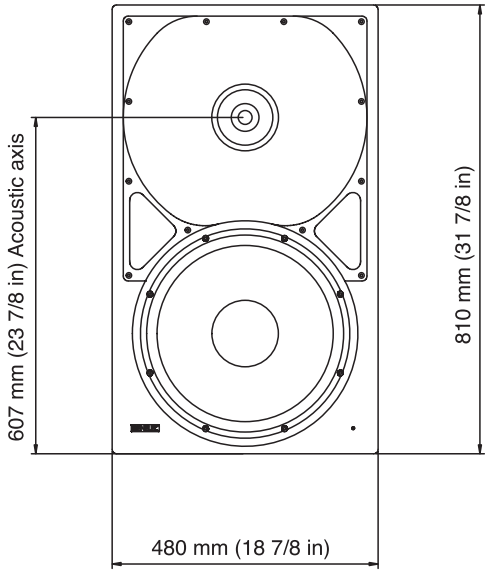
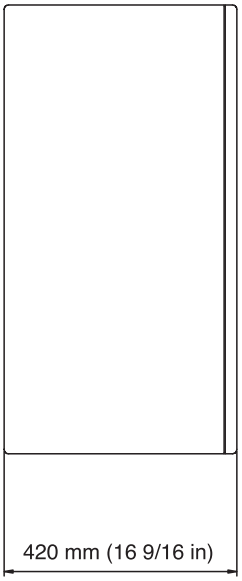


Figure 23. The curve above is a 1/6 octave smoothed power response of the 8380A.





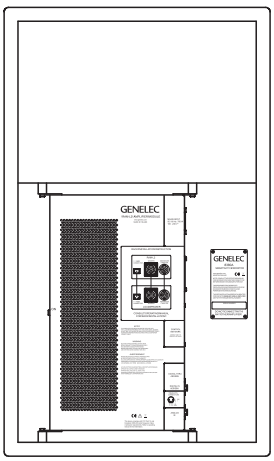


Figure 24. The dimensions of the 8380A.

SYSTEM SPECIFICATIONS

	8380A
Lower cut-off frequency, –6 dB	≤ 29 Hz
Upper cut-off frequency, –6 dB	≥ 43 kHz
Accuracy of frequency response, ± 1.5 dB	38 Hz – 20 kHz
Maximum short term sine wave acoustic output on axis in half space, averaged from 100 Hz to 3 kHz @ 1 m	> 122 dB SPL
Max. short term sine wave output @ 1 m on axis in half space, averaged 50 - 100 Hz (10 % THD)	> 118 dB SPL
Maximum long term RMS acoustic output in the same conditions with IEC weighted noise (limited by driver protection circuit) @ 1 m	> 115 dB SPL
Maximum peak acoustic output per pair in a listening room with music material @ 2 m	> 124 dB SPL
Self generated noise level in free space at 1 m on axis (A-weighted)	0 dB
Harmonic distortion at 95 dB SPL at 1 m on axis Frequency > 50 Hz	 ≤ 0.5 %
Minimum latency from input to acoustic output Extended Phase Linearity ON Extended Phase Linearity OFF	 6.6 ms 2.8 ms
Drivers Bass Coaxial Midrange Coaxial Treble	 380 mm (15 in) cone 130 mm (5 in) cone 25 mm (1 in) metal dome
Weight (monitor with integrated amplifier)	54 kg (119 lb)
Weight (monitor with amplifier removed)	48 kg (106 lb)
Amplifier weight	6 kg (13 lb)
Dimensions (monitor enclosure) Height Width Depth	 810 mm (31 7/8 in) 480 mm (18 7/8 in) 420 mm (16 9/16 in)
Amplifier dimensions (in rack mount configuration) Height (front panel) Height (amplifier casing) Width (front panel) Width (amplifier casing) Depth	 3U 132 mm (5 3/6 in) 80 mm (3 1/8 in) 483 mm (19 in) 425 mm (16 3/4 in) 252 mm (9 15/16 in)

AMPLIFIER SECTION

	8380A
Bass amplifier short term output power Midrange amplifier short term output power Treble amplifier short term output power Long term output power is limited by driver protection circuitry	500 W 250 W 200 W
Amplifier system THD at nominal output	< 0.01 %
Signal to Noise ratio, referred to full output Bass Midrange Treble	 >115 dB >115 dB >115 dB
Mains voltage	100-240 VAC, 50/60 Hz
Power consumption Standby Idle Full output Data for overcurrent protective device and mains cabling dimensioning, power level. Full output, IEC noise	 <0.5 W 21 W 800 W 150 W
Cooling load for air conditioning system. Typical use (90 dB SPL at 1 metre) Monitor enclosure Amplifier	 3 W / 10 BTU/hr 22 W / 75 BTU/hr

SIGNAL PROCESSING SECTION

	8380A
Analog signal input connector XLR female, balanced 10 kOhm Maximum analog input signal Analog input sensitivity (100 dB SPL at 1 m)	pin 1 gnd pin 2 non-inverting, pin 3 inverting +25.0 dBu -6 dBu
Digital signal input connector XLR female 110 Ohm	AES/EBU Single Wire
Digital signal output / Thru connector XLR male 110 Ohm	AES/EBU Single Wire
Digital audio input Word length Sample rate	 16 - 24 bits 32 - 192 kHz
Digital input sensitivity (100 dB SPL at 1 m)	-30 dBFS
Control network Type Connection	 Proprietary GLM™ network 2 RJ45, CAT5 cables
Crossover frequency Bass/Mid Mid/Treble	 470 Hz 2.5 kHz
GLM™ software frequency response adjustment Parametric notch filters Shelving filters	 16 2 LF and 2 HF
System calibration	Genelec GLM AutoCal™

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