

Genelec 1091A  
Active Subwoofer System



# Genelec 1091A Active Subwoofer System



## APPLICATIONS

NEAR FIELD MONITORING

AUDIO VISUAL POST PRODUCTION

MOBILE VANS

HOME THEATRES

PROJECT / HOME STUDIOS

DIGITAL WORKSTATIONS

MULTIMEDIA PRODUCTION / PLAYBACK

## SYSTEM

The 1091A active subwoofer is a very compact low frequency loudspeaker, incorporating all the amplifier and crossover electronics needed to combine it with Genelec 1029 or 2029 series loudspeakers. The 1091A is intended to reproduce frequencies from 38 - 85 Hz ( $\pm 2.5$  dB). The amplifier unit, which is integrated into the cabinet, consists of the active crossover filter, driver overload protection circuits and a power amplifier. The subwoofer has two input connectors and adjustable sensitivity. This provides great flexibility.

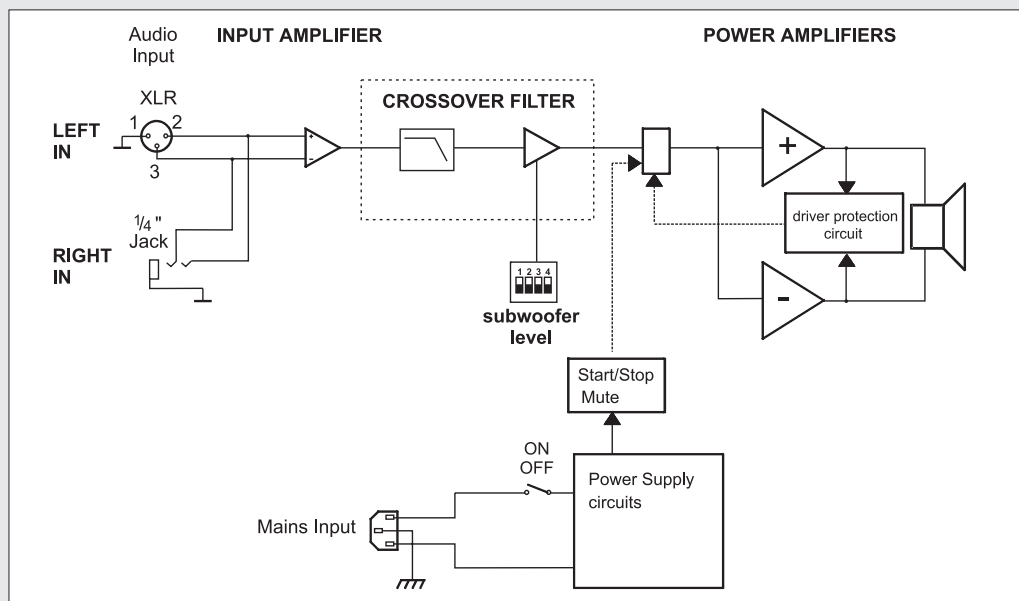


Figure 1. Block diagram, showing active crossover filters, power amplifiers and driver units.

## INTEGRATED CONSTRUCTION

The combination of the cabinet and amplifier in one unit results in a simple and robust system. The 1091A is factory calibrated as a single unit. This eliminates the effects of component tolerances and ensures consistent quality. The cabinet is made from MDF with rounded corners and a hard-wearing textured black surface. The driver is concealed inside an efficiency boosting cavity, which also protects it from physical damage.

## CROSSOVER FILTERS

The active crossover contained within the amplifier unit filters the input signals. This accurately rejects the higher frequencies that the monitors reproduce, and allows the lower frequencies to pass. The sensitivity can be attenuated by 8 dB in 2 dB steps, to allow easy level matching with the main speakers for varying positions. A balanced XLR female and a balanced 1/4" jack socket are used for the system inputs. This allows for easy integration with Genelec 1029 and 2029 series active monitors.

## AMPLIFIER

The amplifier produces 70 W of output power, with very low THD and IM distortion. It is mounted on thick aluminium, which provides excellent heat dissipation. Driver overload protection and power-on signal muting is included in the amplifier circuitry. This makes the system immune to overloads and spurious signals. Power-on signal muting electronically disconnects the drive unit when the power is turned on. The amplifier also incorporates thermal overload and short circuit protection.

## DRIVER

The 1091A has one 210 mm (8") cone driver, capable of producing high SPL's. The driver is housed in a 15 litre vented cabinet. It is specially front loaded to improve both the passband efficiency and stopband rejection.

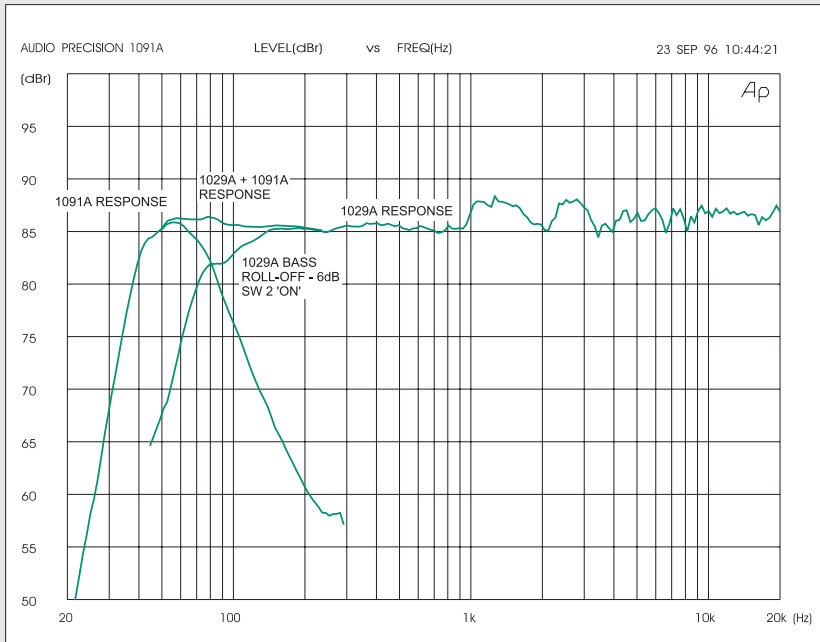


Figure 2. The leftmost curve shows the 1091A free field frequency response. The right hand curve shows the response of the 1029A monitor. The uppermost curve shows the overall frequency response when the two systems are combined.

### FREQUENCY RESPONSE

The frequency response of the 1091A is tailored to suit the low frequency response of Genelec 1029 and 2029 series Active Monitors.

### WHY A SUBWOOFER?

For applications, such as computer multimedia work and most types of near field monitoring, the 1029/2029 is an appropriate monitor system. However if lower LF cutoff and more SPL are required, for example in a home theatre system, the 1091A subwoofer has been designed for this requirement.

The 1091A and 1029/2029 series have been designed alongside each other. When combined they give a flat frequency response from 38Hz to 20kHz. This specification is comparable to some larger Genelec monitors - one of the differences is the greater SPL's offered by larger systems.

The 1029/2029 and 1091A combination offers greater flexibility on placement positions. Due to the 1029/2029's physical size it can be located on desks and, if carefully placed appear fairly innocuous in a room. Further advice on how to place the monitor is described in the operating manual.

If the subwoofer and main speakers are placed properly some of the low frequency problems associated with free standing speakers can be avoided.

### CABLING AND CONNECTIONS

Figure 3 shows the 1091A and the 1029A's. Figure 4 shows how the system should be cabled. The input to the 1029/2029 monitor is made by an XLR connection. This can be either balanced (e.g. output of mixing console) or unbalanced (e.g. output of CD player). The subwoofer output of the 1029/2029, and hence the inputs to the 1091A are balanced. The wiring diagrams for these configurations can be found in the operating manual which is supplied with the systems. The inputs to the subwoofer are a 1/4" jack and a female XLR. It makes no difference as to which channel is used for the left and right signal.

### WHY ACTIVE SPEAKERS?

There are various reasons why active speakers are preferable to passive alternatives, the most dominant being the integrated construction allowing better optimization of the system performance. The monitors are always delivered as a complete factory calibrated system, consisting of all amplifiers, crossover electronics and speaker cabinets.

In an active monitor system the amplifiers are connected directly to the drive units. Distortion anomalies and losses caused by passive crossovers are completely avoided resulting in better sound quality and maximum acoustic efficiency.

For every model of monitor the associated amplifiers have a unique design including driver overload protection. The overload protection detects signals that are above the drivers safe limits preventing damage. This makes the system immune to overloads and spurious signals which synthesizers, sequencers and multimedia sources, such as sound cards, can occasionally produce.

The crossover and phase responses are optimized for each particular model to achieve highly accurate system performance. Consequently every model has the same neutral sound.



Figure 3. The 1091A subwoofer and a pair of 1029A monitors.

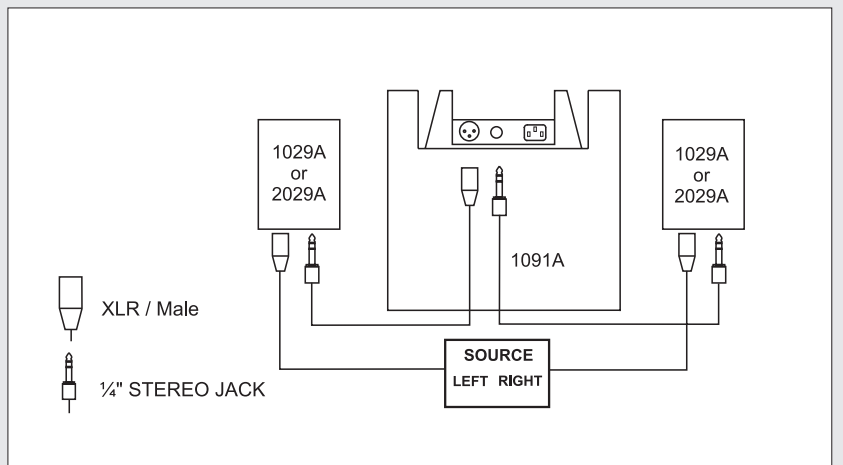


Figure 4. Block diagram to illustrate how the monitors and subwoofer interconnect.

## 1091A SYSTEM SPECIFICATIONS

Free field frequency response of system ( $\pm 2.5$ dB):	38 - 85 Hz
Maximum short term sine wave acoustic output in half space, averaged from 45 Hz to 80 Hz @ 1m:	$\geq 103$ dB SPL
Self generated noise level in free field @ 1m on axis (A-weighted)	$\leq 10$ dB
Harmonic distortion at 95 dB SPL @ 1m on axis in half space (40...85 Hz):	$< 3\%$
Driver:	210 mm (8")
Weight:	10.2 kg (22.4 lb)
Dimensions: Height	505 mm (19 <sup>7</sup> / <sub>8</sub> ")
Width	251 mm (9 <sup>7</sup> / <sub>8</sub> ")
Depth	230 mm (9")

## FILTER SECTION

Lowpass filter above 85 Hz:	24 dB/Octave
Subsonic filter below 38 Hz:	18 dB/Octave
Crossover frequency, (sub/main monitors)	85 Hz
Midband rejection, frequencies $\geq 400$ Hz:	$\geq 50$ dB
Level control operating range in -2 dB steps:	from 0 to -8 dB (Reference to 1029/ 2029 output)

## AMPLIFIER SECTION

Amplifier output power : (Long term output power is limited by driver unit protection circuitry.)	70 W (16 Ohm)
Amplifier system distortion at nominal output:	THD $\leq 0.08\%$ SMPTE-IM $\leq 0.08\%$ CCIF-IM $\leq 0.08\%$ DIM 100 $\leq 0.08\%$
Signal to Noise ratio referred to full output:	$\geq 90$ dB
Mains voltage:	100/200 or 115/230V
Voltage operating range:	$\pm 10\%$
Power consumption (average):	Idle 9 VA Full output 100 VA

## INPUT SECTION

Input connectors	XLR female 1/4" Jack pin 1: gnd sleeve pin 2: + tip pin 3: - ring
Input impedance:	2 x 33 kOhm balanced.
Input level for 100dB SPL output @ 1m in full space:	variable from -23dBu to -15dBu in 2dB steps.

All data subject to change without prior notice