



Low noise measurement using Sound Analyser Nor140

This application note describes how you can turn your Sound Analyser Nor140 into a powerful system for measuring very low noise levels with full measurement accuracy down to 10dBA

Measuring sound pressure levels below 25dBA with the normal microphone and preamplifier delivered with the Nor140 will result in an increasing measurement error, as you approach the intrinsic noise level. The error increase from about 0,4dB at 25dBA down to 3dB at 15dBA, assuming the system self noise is 15dBA, which is a typically value for the Nor140 with Nor1209 preamplifier and Nor1225 microphone. Option 18 allows the A, C or Z -weighted networks to be self noise compensated in the instrument. This requires, however, that the self noise is measured and stored in the instrument. This method does not correct for the self noise on the 1/1 or 1/3 octave frequency bands. The method is sensitive for change in the self noise. It is recommended to verify the self noise level prior to a measurement. Please consult the instruction manual for Nor140 for further details.

Another method is to replace the microphone Nor1225 and preamplifier Nor1209 with a special low-noise microphone system, such as G.R.A.S. 40HL or B&K4955.

G.R.A.S. has developed a special version of their Low Noise microphone system 40HL which is directly pin compatible with the Norsonic Nor140. This version of the microphone system has type number 40HL-N. Due to the low electrical noise in the Nor140 input circuitry, the combination of Nor140 and G.R.A.S. 40HL-N gives a typical combined self noise as shown in graph below. The system self noise is typically less than 7,5dBA, enabling measurements down to 17,5dBA with a measurement failure less than 0,4dB due to the influence of the self noise level. Please note that it is recommended to switch on the input amplifier band pass filter in the Nor140 to limit the influence of low frequency noise. Please consult instruction manual for the Nor140 for further details.

By enabling option 18 when using the G.R.A.S.40HL-N, you may measure sound pressure levels less than 10dBA with class 1 specifications according to IEC61672.

Please note that the TEDS function is disabled in the 40HL-N.

Using G.R.A.S. 40HL-N or B&K4955 on Nor140 with serial number lower than 1404071, the current limitation in the power supply to the preamplifier needs to be adjusted. This can be done by a local Norsonic service laboratory or at the factory.

