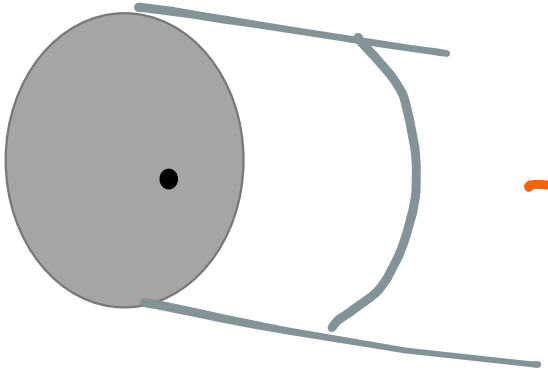
Microphone Damage

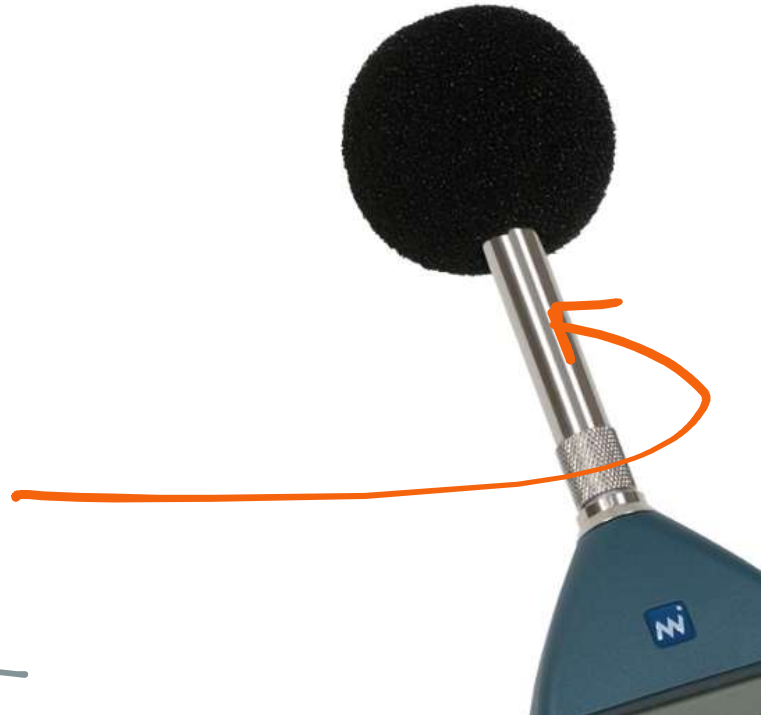
Microphone low frequency response is controlled by several factors but the most important is the barometric pressure equalisation system.

To ensure the microphone responds to sudden changes in pressure (applying a calibrator etc) you need a fast response.

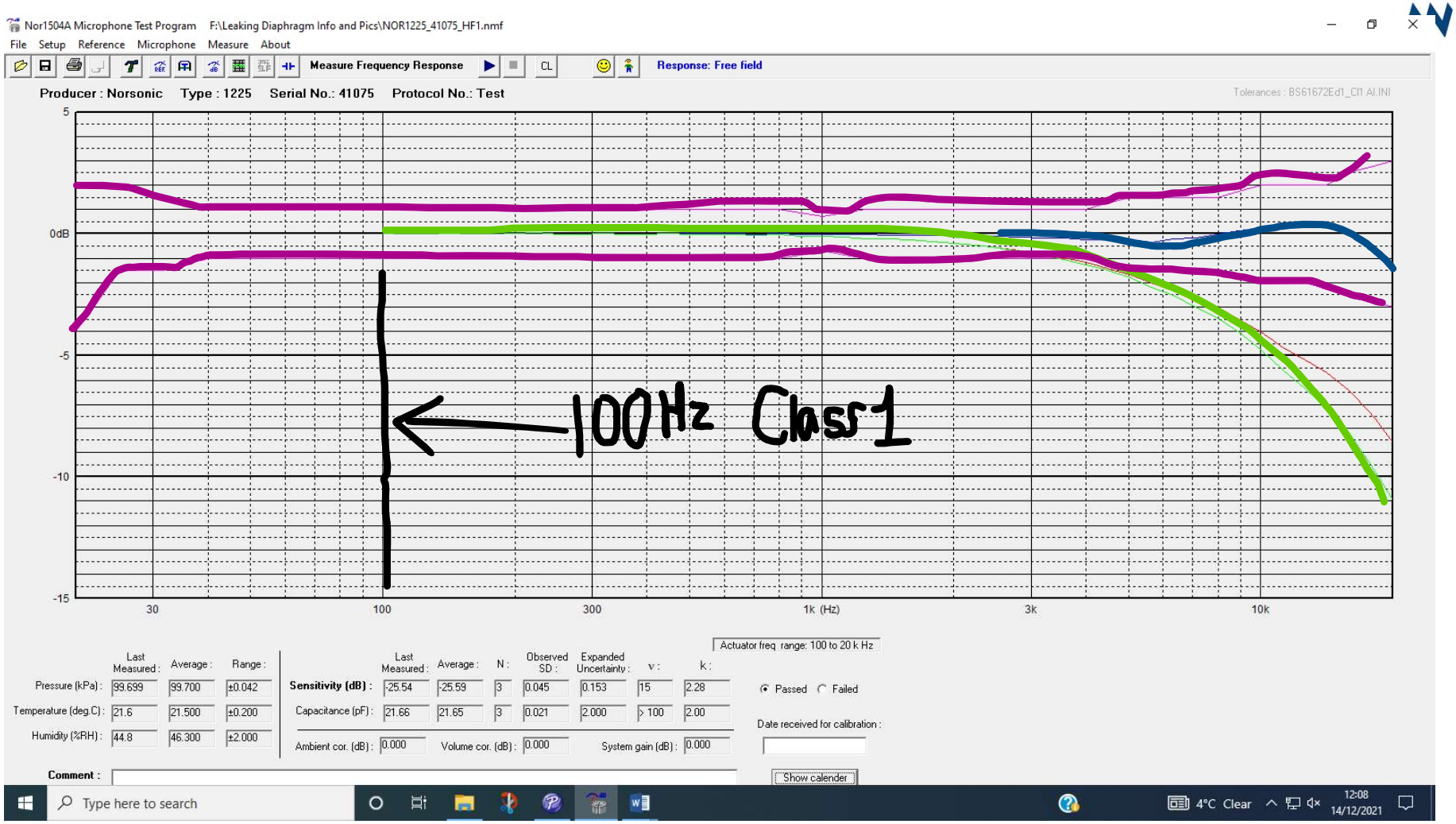
This can allow the low frequency sound to enter the rear of the microphone, it will then be on both sides of the diaphragm, and it will not therefore move.

A pin hole in the diaphragm will also allow the sound wave to enter the rear cavity of the microphone.



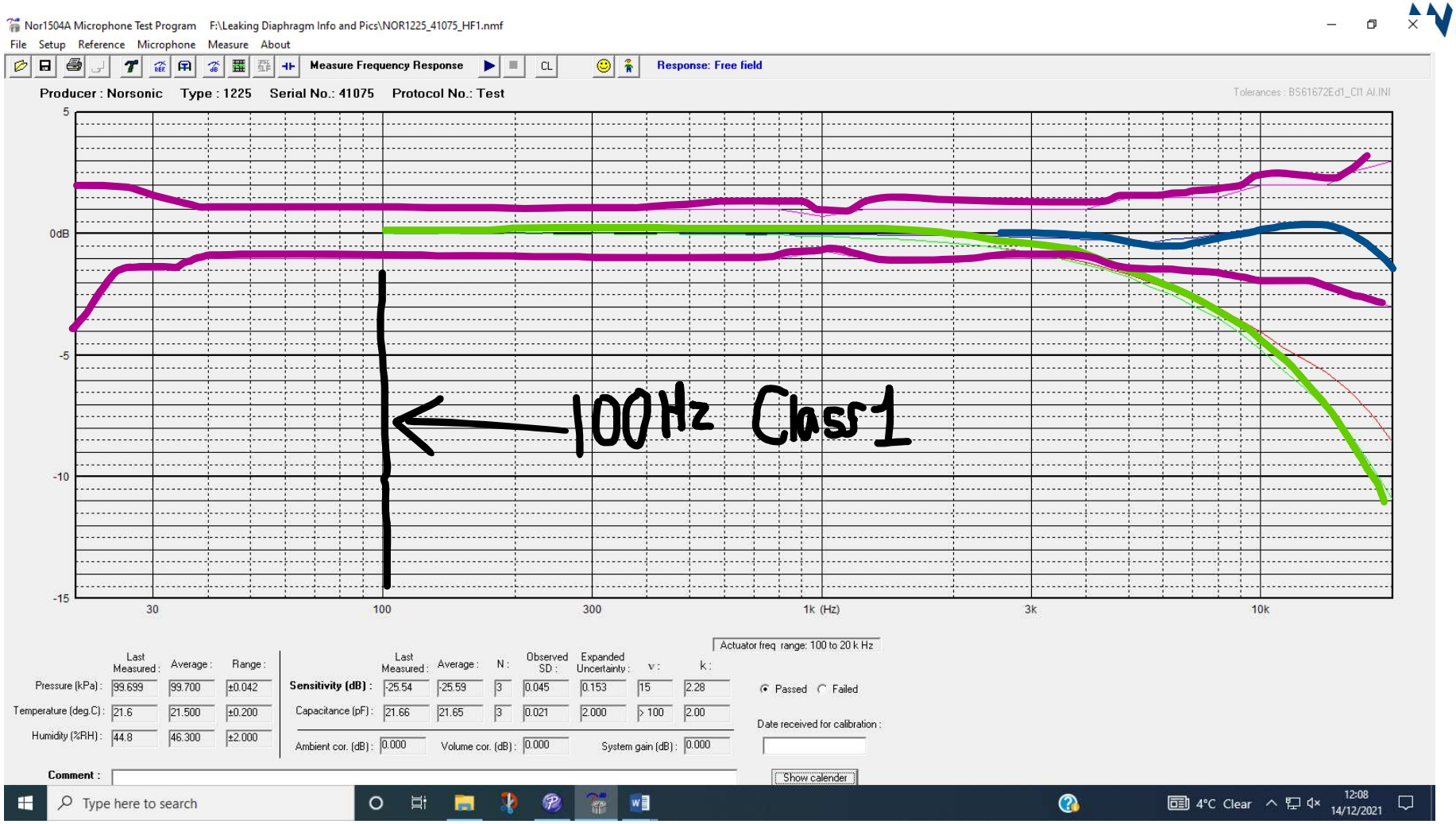


CAMPBELL ASSOCIATES
SOUND, VIBRATION & AIR SOLUTIONS



CAMPBELL ASSOCIATES
SOUND, VIBRATION & AIR SOLUTIONS

Above is a standard calibration (green trace) with class 1 limits shown. Note there is no data reported below 100 Hz.



CAMPBELL ASSOCIATES
SOUND, VIBRATION & AIR SOLUTIONS

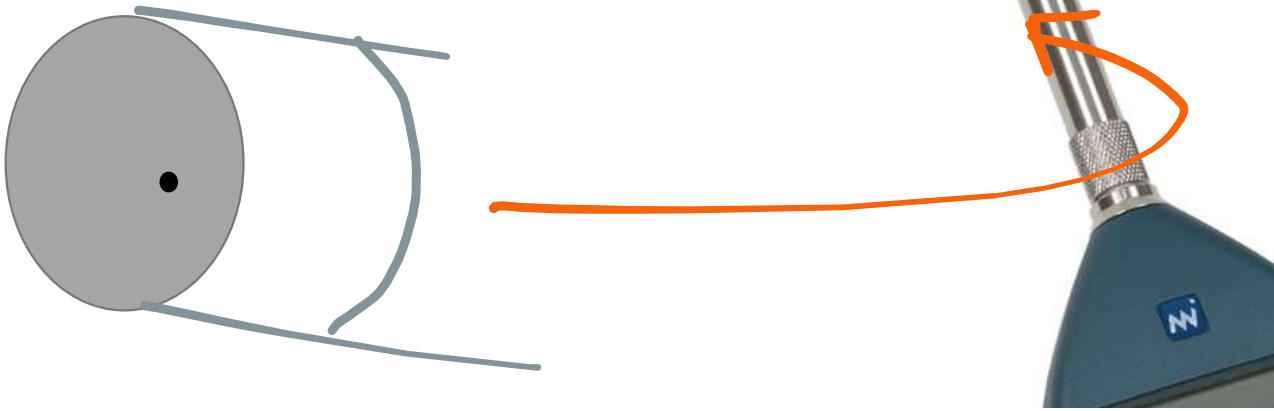
To calibrate below 100 Hz a different calibration method must be used that ensures the correct result is obtained. It is therefore and optional extra that must be specified at the time of calibration.

Adding the low frequency calibration shows this microphone has a hole in its diaphragm. Note it has normal responses at the 250 and 1k Hz frequencies used by sound calibrators so the problem would not be apparent in use. Would also give reasonable A weighted measurements.

CAMPBELL ASSOCIATES
SOUND, VIBRATION & AIR SOLUTIONS

Microphone Damage

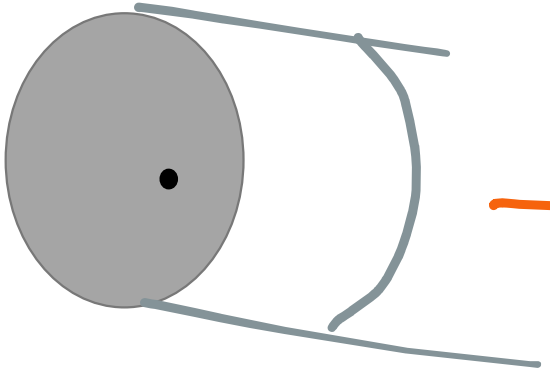
The 250Hz or 1Khz calibrator will not detect an issue with low frequency noise and a pin hole in the microphone.

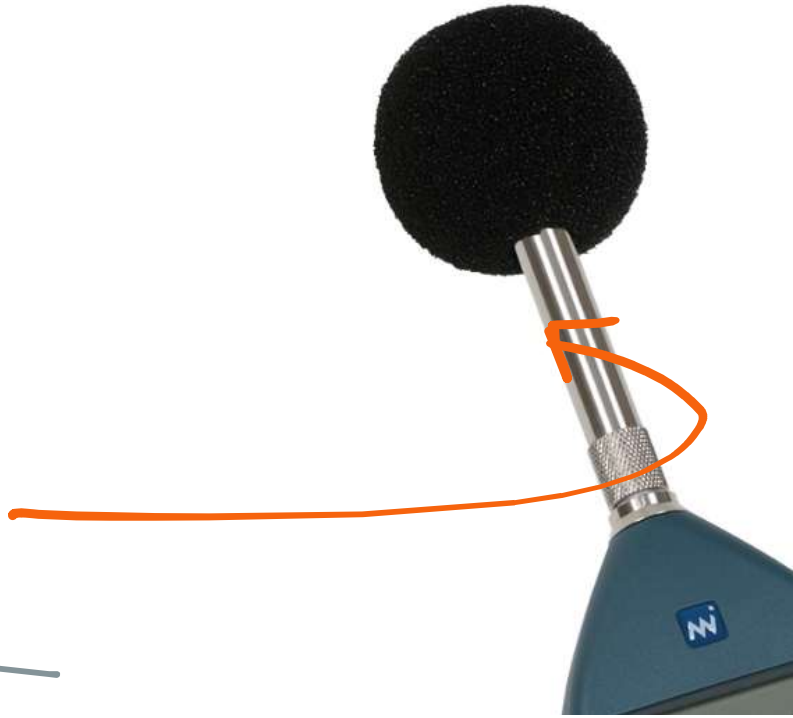


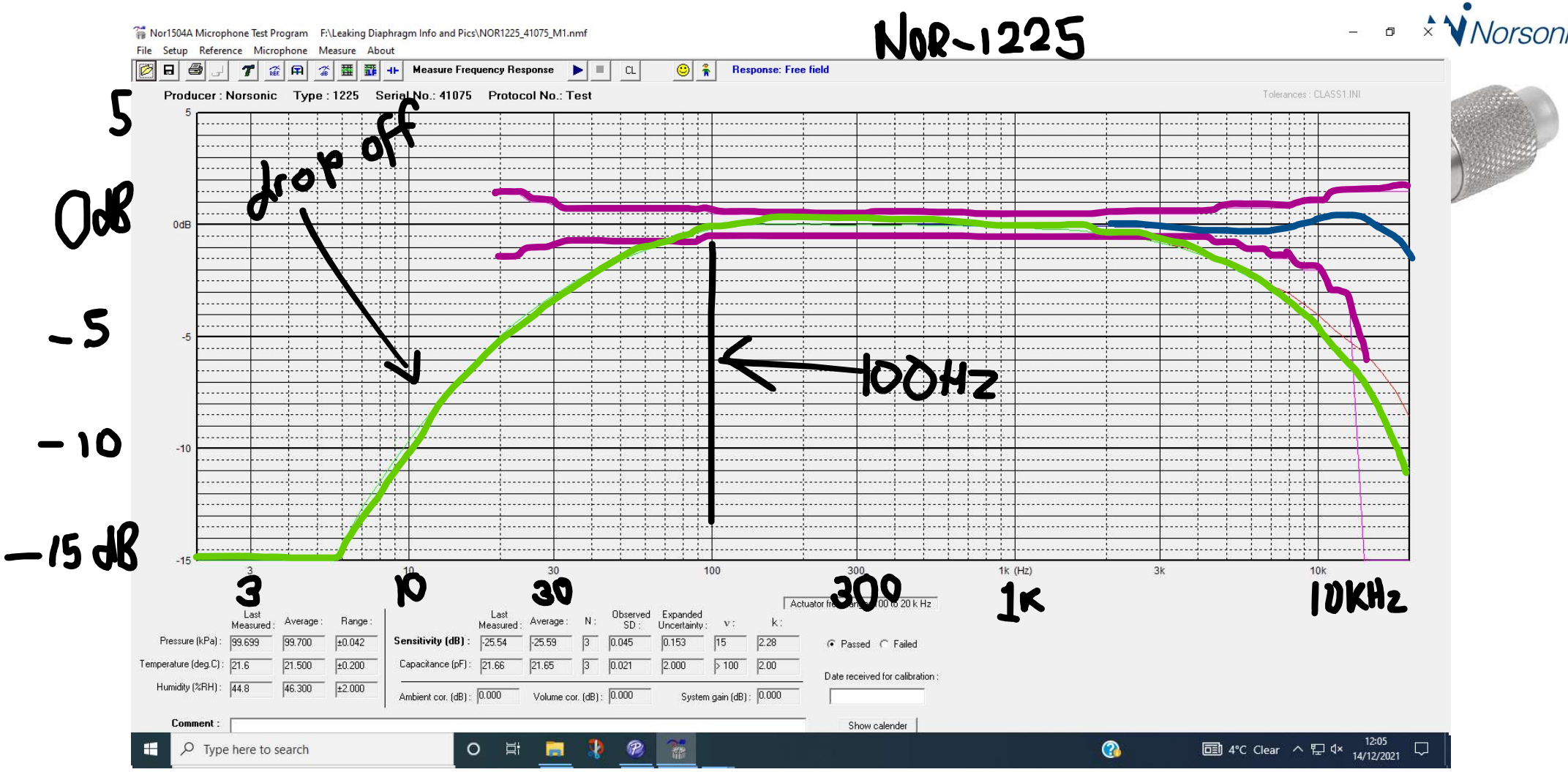
CAMPBELL ASSOCIATES
SOUND, VIBRATION & AIR SOLUTIONS

Microphone Damage

The only solution is to carry out a low frequency noise calibration in the laboratory and as a minimum carry out in inspection visually, but it must done under a magnified glass as they maybe not be dectable to the human eye.

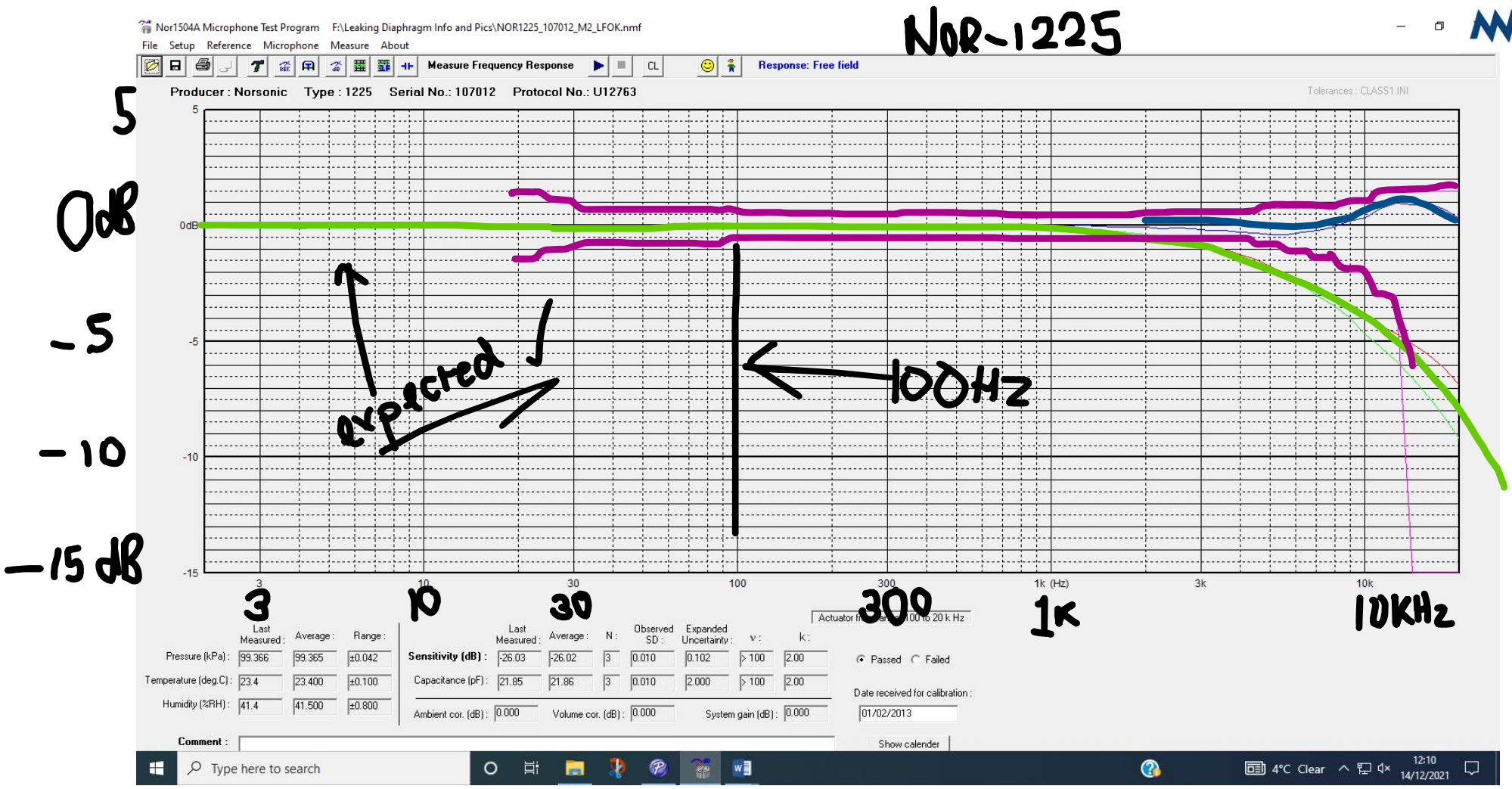






CAMPBELL ASSOCIATES
SOUND, VIBRATION & AIR SOLUTIONS

Above is a standard calibration (green trace) with class 1 limits shown. Note there is no data reported below 100 Hz.



CAMPBELL ASSOCIATES
SOUND, VIBRATION & AIR SOLUTIONS

Above is a standard calibration (green trace) with class 1 limits shown. Note there is no data reported below 100 Hz.

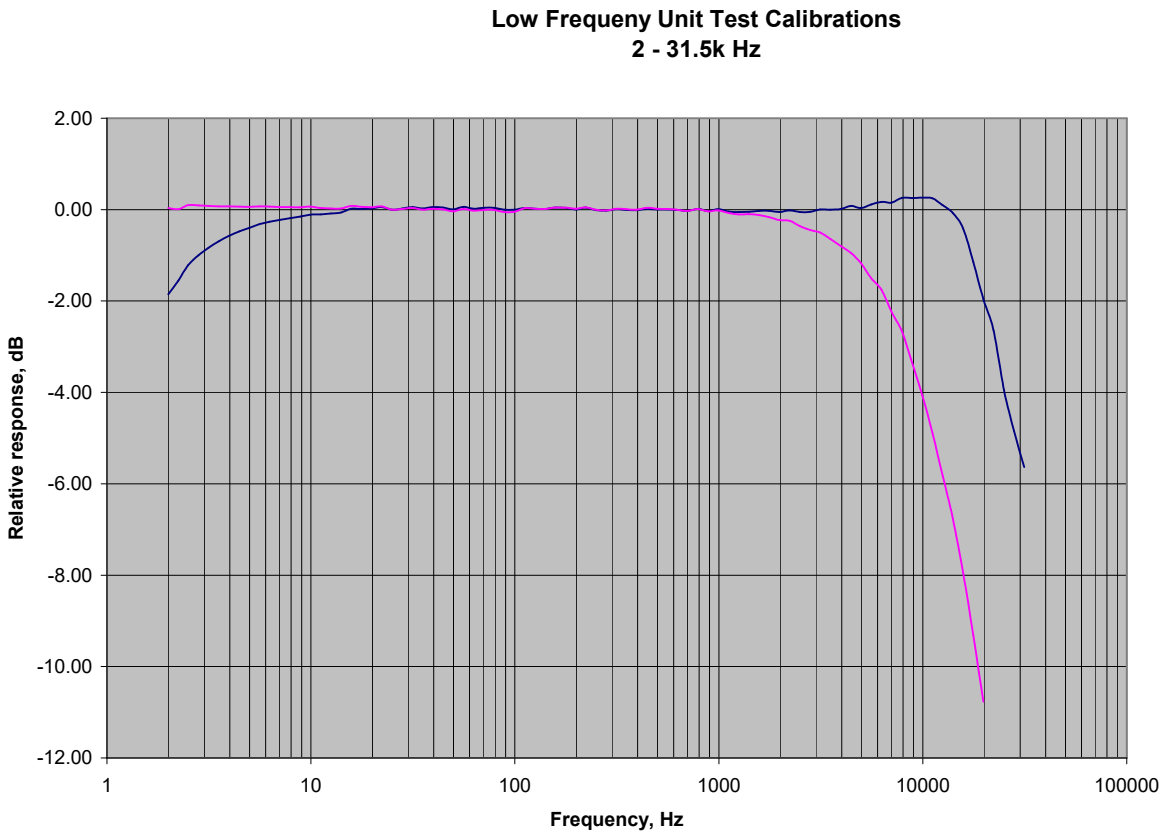
The example shown above was visible to the naked eye, usually they are not but still affect the LF performance. We always make visual inspections of the microphone diaphragm on receipt for calibrations but this is no guarantee that the LF response is OK

Final response shows different manufacturers ideas on where to set the microphone rear venting.

CAMPBELL ASSOCIATES
SOUND, VIBRATION & AIR SOLUTIONS

CAMPBELL ASSOCIATES
SOUND, VIBRATION & AIR SOLUTIONS

The Pre-amp is also vented



Final response shows different manufacturers ideas on where to set the microphone rear venting.

CAMPBELL ASSOCIATES
SOUND, VIBRATION & AIR SOLUTIONS