

Outdoor Microphone

Nor1216 for permanent installations



- Outdoor microphone for community and aircraft noise.
- Fulfils IEC 60651, IEC 61672 class 1 and ANSI S1.4 type 1 (frequency correction applied).
- Protection class IP 55 (dust and water).
- Easy to calibrate with a normal 1/2" sound calibrator.
- Microphone verification by SysCheck facility.
- Low self noise – typically below 17 dB, A-weighted.
- Delivered with individually calibration certification.
- Built in heating for enhanced weather protection.
- Directly powered and supported by Nor140, Nor145 and Nor150 (built in selectable frequency correction networks, heater supply and SysCheck signal generator).
- Type approved by PTB, Germany.

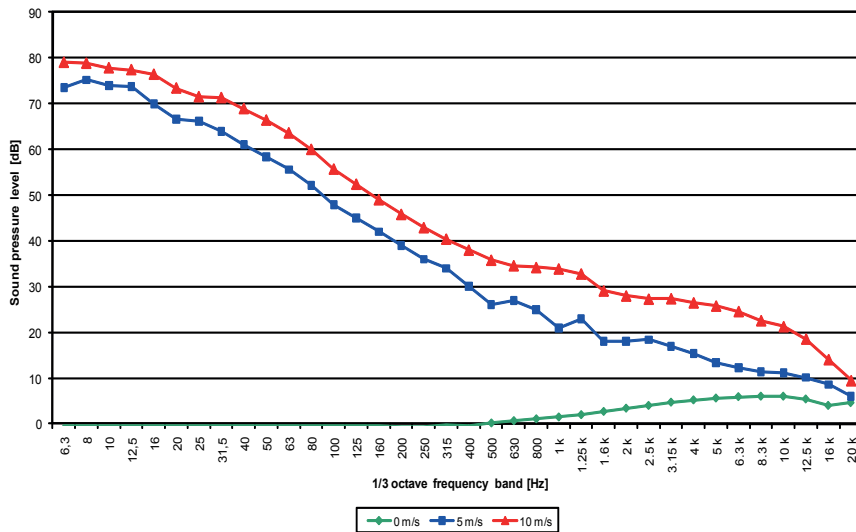


The Outdoor Microphones Nor1216 is a high quality measurement microphone for all-weather conditions. The Nor1216 is designed for permanent outdoor applications and has a special preamplifier with a build in electrical heater resistor which enhances the weather proof protection, and prevents the system from condensation problems in cold weather with high humidity.

The Nor1216 is designed for use with the Nor140, Nor145 and Nor150 Sound Analysers. The instrument allows a direct connection via Nor1408A, a standard Lemo 7 pin microphone cable supplied in various lengths. There is no need for extra adapter box or power supplies. The Nor140, Nor145 and Nor150 have selectable frequency correction for both community and airport applications. The instruments also support the SysCheck verification and power for the heater resistor in the Nor1216

The Nor1216 supports two different microphone capsules. The Nor1225 and Nor1227. The Nor1225 is an external polarised free field microphone having a nominal sensitivity of 50mV/Pa. This capsule is normally supplied with the Nor140 and Nor150 sound analysers. Nor145 is supplied with Nor1227

The Nor1227 is the pre-polarised version of the Nor1225. External polarised microphones is sensitive to drop in the polarisation voltage. Such drop may occur in high humidity environment after some years of use when the equipment may be contaminated. Contamination in combination with high humidity may cause leakage of the 200V polarisation voltage needed for the Nor1225. Hence, pre-polarised microphones is normally a better choice in high humidity environment since they are self-polarised and is not dependent on external polarisation voltage.



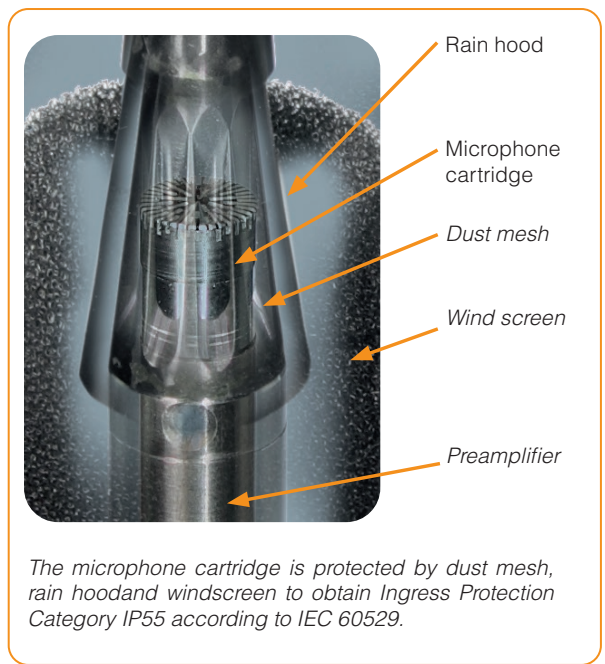
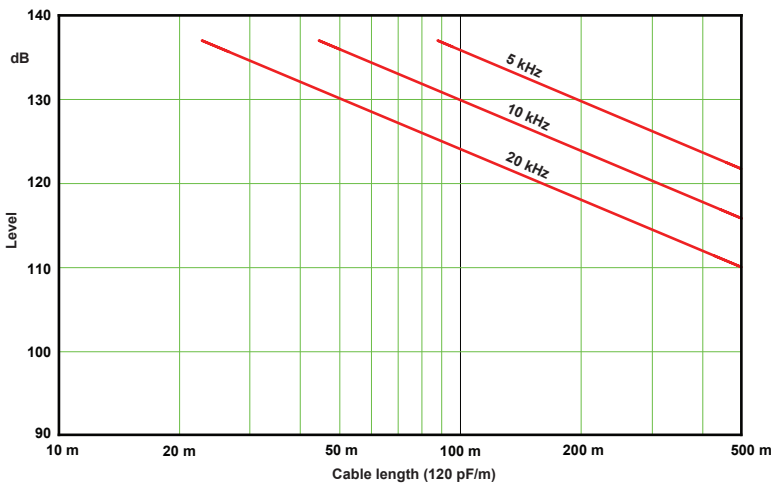
Wind induced noise

Compared to a standard measurement microphone, the Outdoor Microphone Nor1216 improves the measurement accuracy by reducing the wind noise and by improving the directional response for sound from different directions. The diagram shows the typical noise floor for different wind speeds. The noise is typically more than 20 dB less than an unprotected microphone.

A 200mm wind shield Nor4576 may be added to further reduce the wind induced noise, as required by some applications and standards. Frequency correction for the combination of the original wind shield with the 200mm added is supported by the Nor140/Nor145/Nor150.

The correction for this combination of windshields is supported for horizontal direction only.

The figure below shows the maximum level as function of cable length and frequency. 20 kHz corresponds to the bandwidth of the microphone system with the normal microphones Nor1225 and Nor1227.

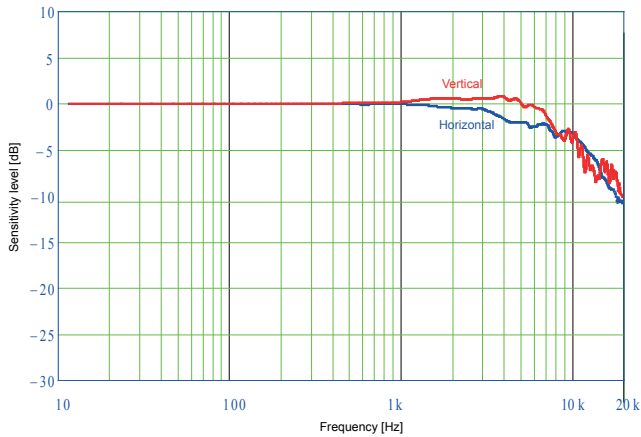


The microphone cartridge is protected by dust mesh, rain hood and windscreen to obtain Ingress Protection Category IP55 according to IEC 60529.



Frequency response

The Nor1216 satisfies IEC 61672 Class 1 requirements and related national standards when used with Nor140, Nor145 or Nor150. These instruments applies a frequency correction to the measured noise signal when the Nor1216 and the vertical or horizontal noise incidence criteria is selected in the instruments transducer selection menu.



Calibration

The Outdoor Microphone may be calibrated with a normal sound calibrator suitable for 1/2" working standard microphones (WS2) without the need for extra accessories. Access to the microphone cartridge is easily gained by dismounting the upper part of the microphone.

The base is made of an electrical insulating material. The microphone body will be fully insulated from the mounting mast thereby reducing pick-up of electrical hum and noise.

By removing the upper part, the outdoor microphone may be calibrated as an ordinary 1/2" microphone.

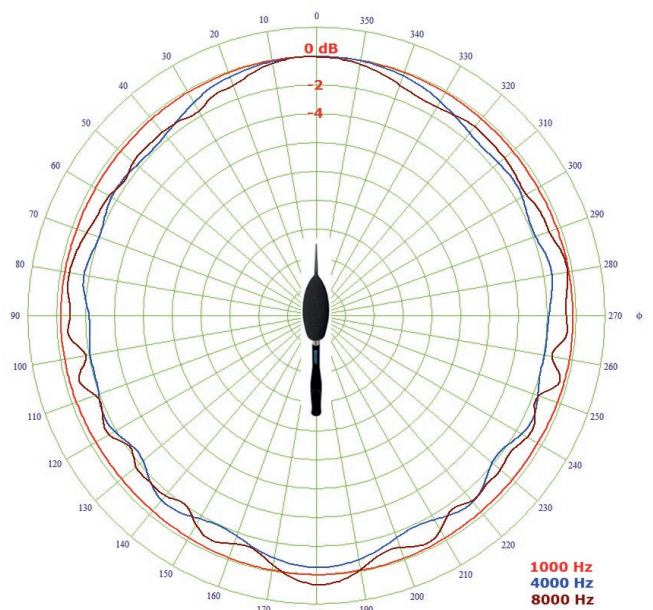
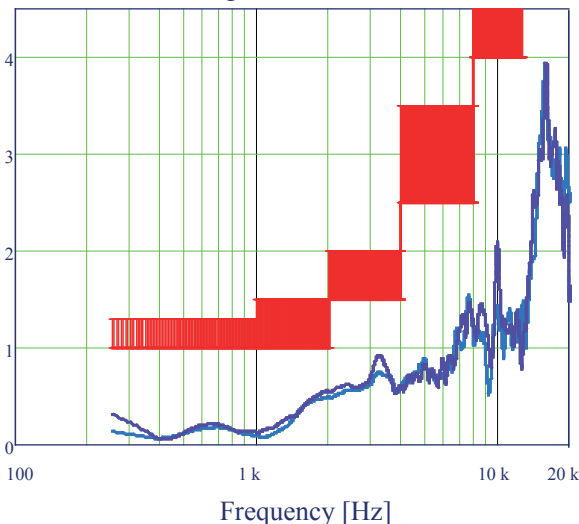


Directional response

The figure below to the right shows the directional response for three frequencies in a vertical plane. A similar diagram in the horizontal plane is very close to circular.

The figure below to the left shows the maximum deviations from an ideal circular response within ±30 degree from a horizontal reference axis as a function of frequency (blue curves) and the tolerance limits as specified in IEC 61672, class 1 (red).

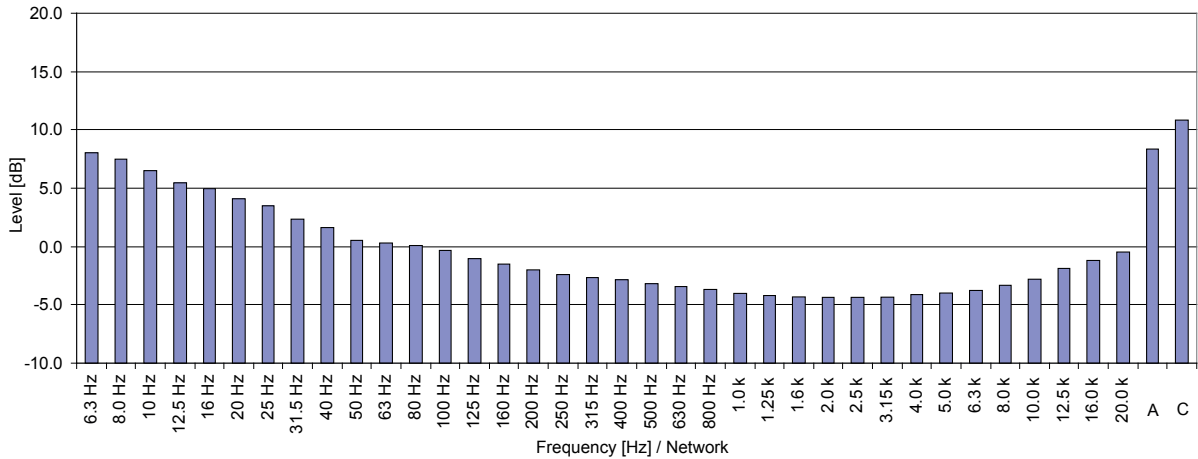
+/- 30 deg – Horizontal reference



SysCheck verification

For verification of proper operation, the microphone is equipped with a system check facility (SysCheck), where an electrical signal applied on one of the terminals are returned after passing through the complete signal

chain, thus verifying proper operation of the microphone cartridge, preamplifier and microphone cable. It is a robust and simple method for verifying a microphone system.



Typical self noise of the microphone system when the microphone is substituted by a capacitor with similar capacitance as the microphone. Note that the acoustical self-noise for a real microphone will be higher due to thermal noise in the microphone cartridge.

Specifications

Acoustic performance: IEC 60651, IEC 61672 class 1 and ANSI S1.4 type 1 (frequency correction applied) with a suitable instrument (Nor140/Nor145/Nor150).

Max sound pressure level: >140 dB peak dependent on supply voltage.

Microphone cartridge: Nor1227 or Nor1225 (1/2" 50 mV/Pa)

Polarization voltage: 0 volt (Nor1227) 200V (Nor1225)

Inherent noise: < 17 dB A-weighted

Reference direction: Vertical or horizontal dependent on the applied frequency correction

Ingress Protection Category: IP55 according to IEC 60529.

Supply voltage: ±14 volt to ±16 volt

Current consumption: 18mA incl. heating.

Connector: 7 pin Lemo type 1B male

Temperature range: -40°C to +85°C

Height: 375 mm / 14.8" (1" pipe mounting)
450 mm / 17.7" with tripod adaptor

Diameter: Approx 80 mm / 3.1" (with windshield)

Weight: Approx 300 g (with preamp microphone)

Mounting thread: Standard 1" pipe threads according to ISO 228. When using the tripod adaptor: 3/8" UNC.

Accessories and spare parts

Windshield upper part: Nor4529

Assembled upper part with windscreen: Nor4560

Microphone: Nor1227 or Nor1225

Microphone preamplifier: Nor1209A

Sound calibrator: Nor1251, Nor1253, Nor1255 or Nor1256.

Microphone cable: Nor1408A Standard lengths 5, 10, 15, 20, 30 and 50 meters – other lengths on request.

Extra wind protection: 200 mm windshield Nor4576.

Ordering information

Nor1216 – Outdoor microphone excluding microphone cartridge with internal preamp1209A with heating.

Nor1216/1225 – same as above, but including 1/2" 200V polarised microphone Nor1225

Nor1216/1227 – same as **Nor1216**, but including 1/2" self polarised microphone Nor1227.