Appendix B

Measurement Parameters

This appendix describes the measurement parameters available on the 2270 system. They are measured in accordance with the setup parameters.
Please refer to the Glossary in Appendix E for a description of the parameters.
The following letters are substituted in the parameters that follow to represent the wide range of frequency weightings, time weightings and percentile levels available:
V = frequency weightings A, B, C or Z (controlled by **Setup** – *Frequency Weightings – Broadband Peak* parameter)
X = frequency weightings A or B (controlled by **Setup** – *Frequency Weightings – Broadband (excl. Peak)* parameter)
Y = frequency weightings C or Z (controlled by **Setup** – *Frequency Weightings – Broadband (excl. Peak)* parameter)
W = frequency weightings A, B, C or Z (controlled by **Setup** – *Frequency Weightings – Spectrum* parameter)
U = time weightings F or S (controlled by **Setup** – *Statistics – Spectral Statistics based on* parameter)
R = time weightings F or S (controlled by **Setup** – *Occupational Health – Time Weighting for Lav* parameter)
Q = exchange rate 4, 5 or 6 dB (controlled by **Setup** – *Occupational Health – Exchange Rate* parameter)
N = number between 0.1 and 99.9 (controlled by **Setup** – *Statistics – Percentile N parameter*)

B.1 Total Measurement

B.1.1 For Sound Level Meter Software BZ-7222, Frequency Analysis Software BZ-7223, Logging Software BZ-7224 and Enhanced Logging Software BZ-7225

The following parameters are measured within the Elapsed Time:
Equivalent Continuous Sound Levels
• L_{Xeq}
• L_{Yeq}
• L_{Ceq}-L_{Aeq}
Sound Exposure Level
• L_{XE}
• L_{YE}
Peak Sound Level
• L_{Vpeak}
• T_{Vpeak}
Maximum Time-weighted Sound Levels
• L_{XFmax}
• L_{XSmax}
• L_{XImax}
• L_{YFmax}
• L_{YSmax}
• L_{YImax}
Minimum Time-weighted Sound Levels
• L_{XFmin}
• L_{XSmin}
• L_{XImin}
• L_{YFmin}
• L_{YSmin}
• L_{YImin}

ISO/EU Occupational Health Parameters
• $L_{ep,d}$
• $L_{ep,d,v}$
• E
• Dose
• ProjDose
• #VPeaks (>xxx dB)
• #VPeaks (>137 dB)
• #VPeaks (>135 dB)
US Occupational Health Parameters
• L_{avRQ}
• TWA
• TWA_v
• DoseRQ
• ProjDoseRQ
General Parameters
• Overload in %
• Start time
• Stop Time
• Elapsed Time (excl. pauses)
• Time Remaining (for the current measurement, taking available diskspace into account)
Special Parameters
• L_{XIeq} (also called L_{XIm})
• L_{YIeq}
• L_{AIeq}-L_{Aeq}
• L_{AFTeq} (also called L_{AFTm5})
• L_{AFTeq}-L_{Aeq}
• SIL (average of L_{Zeq} octave band levels: 500 Hz, 1000Hz, 2000 Hz and 4000 Hz)[a]
• PSIL (average of L_{Zeq} octave band levels: 500 Hz, 1000Hz and 2000Hz)[a]
• SIL3 (average of L_{Zeq} octave band levels: 1000Hz, 2000 Hz and 4000 Hz)[a]
• L_{Weq}(f1-f2) (average of power values for L_{Weq} frequency bands from f1 Hz to f2 Hz)[a]
Noise Indicators[b]
• L_{day}
• $L_{evening}$
• L_{night}
• L_{den}
• L_{dn}
Statistics to Calculate Percentile Levels and Std.Dev.
Spectrum Parameters[c]
• L_{Weq}
• L_{WFmax}

a. These parameters require license for BZ-7223 and measurement of spectra.
b. These parameters are available for Enhanced Logging BZ-7225 only.
c. These parameters require license for BZ-7223 and measurement of spectra.

• L_{WSmax}
• L_{WFmin}
• L_{WSmin}
Statistics to Calculate Percentile Levels as Spectra[a]
CIC Results
• CIC 1 Result[b]
• CIC 1 Dev. from Reference[b]
• CIC 2 Result[b]
• CIC 2 Dev. from Reference[b]
• CIC 3 Result[c]
• CIC 3 Dev. from Reference[c]
• CIC 4 Result[c]
• CIC 4 Dev. from Reference[c]

B.2 Periodic Reports

B.2.1 For Enhanced Logging Software BZ-7225

Parameters measured within a Periodic Report interval:

Equivalent Continuous Sound Levels

- L_{Xeq}
- L_{Yeq}
- L_{Ceq}-L_{Aeq}

Sound Exposure Level

- L_{XE}
- L_{YE}

Peak Sound Level

- L_{Vpeak}
- T_{Vpeak}

Maximum Time-weighted Sound Levels

- L_{XFmax}
- L_{XSmax}
- L_{XImax}
- L_{YFmax}

a. These parameters require license for BZ-7223 and measurement of spectra.
b. These parameters are available for Logging BZ-7224 and Enhanced Logging BZ-7225 only.
c. These parameters are available for Enhanced Logging BZ-7225 only.

- L_{YSmax}
- L_{YImax}

Minimum Time-weighted Sound Levels

- L_{XFmin}
- L_{XSmin}
- L_{XImin}
- L_{YFmin}
- L_{YSmin}
- L_{YImin}

ISO/EU Occupational Health Parameters

- $L_{ep,d}$
- $L_{ep,d,v}$
- E
- Dose
- ProjDose
- #VPeaks (>xxx dB)
- #VPeaks (>137 dB)
- #VPeaks (>135 dB)

US Occupational Health Parameters

- L_{avRQ}
- TWA
- TWA_v
- DoseRQ
- ProjDoseRQ

General Parameters

- Overload in %
- Start time
- Stop Time
- Elapsed Time (excl. pauses)

Special Parameters

- L_{XIeq} (also called L_{XIm})
- L_{YIeq}
- L_{AIeq}-L_{Aeq}
- L_{AFTeq} (also called L_{AFTm5})
- L_{AFTeq}-L_{Aeq}
- SIL (average of L_{Zeq} octave band levels: 500 Hz, 1000Hz, 2000 Hz and 4000 Hz)[a]
- PSIL (average of L_{Zeq} octave band levels: 500 Hz, 1000Hz and 2000Hz)[a]
- SIL3 (average of L_{Zeq} octave band levels: 1000 Hz, 2000Hz and 4000 Hz)[a]

• L_{Weq}(f1-f2) (average of power values for L_{Weq} frequency bands from f1Hz to f2 Hz)[a]
Statistics to Calculate Percentile Levels and Std.Dev.
Spectrum Parameters[a]
• L_{Weq}
• L_{WFmax}
• L_{WSmax}
• L_{WFmin}
• L_{WSmin}
The Statistics can be logged in Periodic Reports to Calculate Percentile Levels as spectra[a].

B.3 Logged Measurement

B.3.1 For Logging Software BZ-7224 and Enhanced Logging Software BZ-7225

Parameters measured within a logging interval – up to ten (or all) of the following parameters can be logged:
Equivalent Continuous Sound Levels
• L_{Xeq}
• L_{Yeq}
• L_{Ceq}-L_{Aeq}
Sound Exposure Level
• L_{XE}
• L_{YE}
Peak Sound Level:
• L_{Vpeak}
Maximum Time-weighted Sound Levels
• L_{XFmax}
• L_{XSmax}
• L_{XImax}
• L_{YFmax}
• L_{YSmax}
• L_{YImax}
Minimum Time-weighted Sound Levels
a. These parameters require license for BZ-7223 and measurement of spectra.
• L_{XFmin}
• L_{XSmin}
• L_{XImin}
• L_{YFmin}
• L_{YSmin}
• L_{YImin}
US Occupational Health Parameters
• L_{avRQ}
Special Parameters
• L_{XIeq} (also called L_{XIm})
• L_{YIeq}
• L_{AIeq}-L_{Aeq}
• L_{AFTeq} (also called L_{AFTm5})
• L_{AFTeq}-L_{Aeq}
• SIL (average of L_{Zeq} octave band levels: 500 Hz, 1000Hz, 2000 Hz and 4000 Hz)[a]
• PSIL (average of L_{Zeq} octave band levels: 500 Hz, 1000Hz and 2000Hz)[a]
• SIL3 (average of L_{Zeq} octave band levels: 1000Hz, 2000 Hz and 4000 Hz)[a]
• L_{Weq}(f1-f2) (average of power values for L_{Weq} frequency bands from f1 Hz to f2 Hz)[a]
Voltage updated at approx. 5 s intervals and logged with Logging Period intervals
• Trig. Input Voltage (requires Trigger Input is set to *Voltage for Monitoring*)
The following parameters are available per set of logged parameters
• Overload in %
• Start time
• Stop Time
• Elapsed Time (excl. pauses)

The Statistics can be logged to calculate Percentile Levels and Std.Dev. per logging interval.
Up to three (or all) of the following Spectrum parameters can be logged and displayed on the spectrum display[a]

- L_{Weq}
- L_{WFmax}
- L_{WSmax}
- L_{WFmin}
- L_{WSmin}

The Statistics can be logged in Periodic Reports to Calculate Percentile Levels as spectra[a].

a. These parameters require license for BZ-7223 and measurement of spectra.

B.4 Logged (100 ms) Measurement

B.4.1 For Logging Software BZ-7224 and Enhanced Logging Software BZ-7225

The following Broadband parameters can be logged every 100ms

- L_{Aeq}
- L_{AF}

B.5 Instantaneous Measured Parameters (available at any time)

Instantaneous Time-weighted Sound Levels

- L_{XF}
- L_{XS}
- L_{XI}
- L_{YF}
- L_{YS}
- L_{YI}

Sound Pressure Levels (maximum time-weighted sound levels once per second)

- $L_{XF(SPL)}$
- $L_{XS(SPL)}$
- $L_{XI(SPL)}$
- $L_{YF(SPL)}$
- $L_{YS(SPL)}$
- $L_{YI(SPL)}$

Peak Sound Levels (maximum peak sound level once per second)

- $L_{Vpeak,1s}$

Voltage updated at approx. 5 s intervals

- Trig. Input Voltage (requires Trigger Input is set to *Voltage for Monitoring*)

Instantaneous Measured Spectra:[a]

- L_{WF}
- L_{WS}

B.5.1 Processed Parameters for Display Only

If Statistics are available, then Std.Dev. and 7 percentile levels can be calculated and displayed: *LXN1* or *LXUN1* to *LXN7* or *LXUN7*.

a. These parameters require license for BZ-7223 and measurement of spectra.

If spectral statistics are available, then 7 percentile levels as spectra can be calculated and displayed: *LWUN1* to *LWUN7*.

If L_{Weq} spectrum is available, then NC, NC Decisive Band, NR, NR Decisive Band, RC, RC Classification, NCB, NCB Classification can be calculated and displayed.

If L_{Weq} 1/3-octave spectrum is available, then Loudness and Loudness Level can be calculated and displayed.

B.6 Reverberation Time Measurement

B.6.1 For Reverberation Time Software BZ-7227

The following parameters are measured or calculated at each position:

Decays

• Reverberation Decays (for each frequency band from *Bottom Frequency* to *Top Frequency*) based on sampling L_{Zeq} spectra at 5ms intervals

Spectra

• T30 Spectrum
• T20 Spectrum
• EDT Spectrum

Single Number Values

• T30 (*Wide Band RT Bottom – Wide Band RT Top*)
• T20 (*Wide Band RT Bottom – Wide Band RT Top*)
• EDT (*Wide Band RT Bottom – Wide Band RT Top*)

The following parameters are calculated for the room as an average of all positions:

Decays

• Ensemble Averaged Reverberation Decays (for each frequency band from *Bottom Frequency* to *Top Frequency*)

Spectra

• T30 Spectrum
• T20 Spectrum
• EDT Spectrum

Single Number Values

• T30 (*Wide Band RT Bottom – Wide Band RT Top*)
• T20 (*Wide Band RT Bottom – Wide Band RT Top*)
• EDT (*Wide Band RT Bottom – Wide Band RT Top*)

Quality Indicators are given for each frequency band, in each reverberation time spectrum, and for each reverberation time spectrum.

Instantaneous Measured Parameters (available at any time)

Instantaneous Time-weighted Sound Levels:

• L_{AF}
• L_{CF}

Instantaneous Measured Spectra:

• L_{ZF}

Appendix E

Glossary

A-weighting filter: Frequency weighting corresponding approximately to the 40 dB equal loudness curve, that is to say, the human ear's response at low to medium sound levels. It is by far the most commonly applied frequency weighting and is used for all levels of sound.

B-weighting filter: Frequency weighting corresponding approximately to the 70 dB equal loudness curve, that is to say, the human ear's response at medium sound levels.

C-weighting filter: Frequency weighting corresponding to the 100 dB equal loudness curve, that is to say, the human ear's response at fairly high sound levels. Mainly used when assessing peak values of high sound pressure levels.

Criterion Level: Criterion Level is the maximum averaged sound level allowed for an 8-hour period. Used for calculation of Dose, ProjDose, DoseUQ and ProjDoseUQ, where U = F or S and Q = 4, 5 or 6 dB.

Decibel (dB): The measurement unit for expressing the relative intensity of sound. A direct application of linear scales (in Pa) to the measurement of sound pressure leads to large and unwieldy numbers. As the ear responds logarithmically rather than linearly to stimuli, it is more practical to express acoustic parameters as a logarithmic ratio of the measured value to a reference value. This logarithmic ratio is called a decibel or dB. The advantage of using dB can be clearly seen in the below illustration. Here, the linear scale with its large numbers is converted into a manageable scale from 0 dB at the threshold of hearing (20 · Pa) to 130 dB at the threshold of pain (· 100 Pa).

Our hearing covers a surprisingly wide range of sound pressures – a ratio of over a million to one. The dB scale makes the numbers manageable

Dose, ProjDose: The Noise Dose is the equivalent averaged A-weighted Noise Level (taking the Threshold Level into account) using Exchange Rate = 3 for an 8 hour period (reference duration) relative to the maximum allowed (the Criterion Level) – expressed in percentage.

Example: If the Criterion Level is 85 dB and a person is exposed to a constant sound pressure level of 85 dB for 8 hours, then the Dose is 100%. A constant level 88 dB results in a Dose of 200% and a constant level of 82 dB results in a dose of 50%.
The Projected Dose is the Noise Dose based on measurement duration less than 8 hours, assuming the sound level for the remaining time stays the same.

DoseUQ, ProjDoseUQ: The Noise Dose is the averaged A-weighted Noise Level (taking the Threshold Level into account) with Time Weighting U = F or S and Exchange Rate Q = 4, 5 or 6 for an 8 hour period (reference duration) relative to the maximum allowed (the Criterion Level) – expressed in percentage.

Example: If the Criterion Level is 90 dB and a person is exposed to a constant average sound level of 90 dB for 8 hours with Time Weighting S and Exchange Rate 5, then the DoseS5 is 100%. A constant level 95 dB results in a DoseS5 of 200% and a constant level of 85 dB results in a doseS5 of 50%.
The Projected DoseS5 is the Noise DoseS5 based on measurement duration less than 8 hours, assuming the sound level for the remaining time stays the same.

E: Sound Exposure is the energy of the A-weighted sound calculated over the measurement time. The unit is Pa^2h.

Exchange Rate: Exchange Rate is the increase in noise level that corresponds to a doubling of the noise level. The Exchange Rate is used for calculation of L_{avUQ}, TWA, TWA_v, DoseUQ and ProjDoseUQ, where U = F or S and Q = Exchange Rate: 4, 5 or 6 dB.

Note: L_{Aeq} is always based on an Exchange Rate = 3.

Exposure Time: Exposure Time is the actual time that a person is exposed to noise during a workday. Used for calculation of $L_{ep,d}$ and $L_{ep,d,v}$.

'F', 'S' or 'I' time weighting: A time weighting (sometimes called a 'time constant') defines how the exponential averaging in root-mean-square (RMS) measurement is done. It defines how the heavily fluctuating sound pressure variations are smoothed or averaged to allow useful readings. The standards define three time weightings: F (Fast), S (Slow) and I (Impulse). Most measurements are carried out using the 'F' time weighting, which uses a 125ms time constant.

Frequency: The number of pressure variations per second. Frequency is measured in hertz (Hz). The normal hearing for a healthy young person ranges from approximately 20 Hz to 20000 Hz (20 kHz).

Frequency weighting: Our hearing is less sensitive at very low and very high frequencies. In order to account for this, weighting filters can be applied when measuring sound. The most commonly used weighting is the 'A-weighting', which approximates the human ear's response to low – medium noise levels.
A 'C-weighting' curve is also used, particularly when evaluating very loud or low-frequency sounds.

L_{AE}: Sound Exposure Level – sometimes abbreviated SEL and sometimes called Single Event Level, is the Sound Exposure expressed as a level. The letter 'A' denotes that the A-weighting has been included.

L_{Aeq}: A widely used noise parameter that calculates a constant level of noise with the same energy content as the varying acoustic noise signal being measured. The letter 'A' denotes that the A-weighting has been included and 'eq' indicates that an equivalent level has been calculated. Hence, L_{Aeq} is the A-weighted equivalent continuous noise level.

L_{AF}: The instantaneous time-weighted sound level, Lp, is available at any time. 'A' denotes that the A-frequency weighting is used. 'F' denotes that the Fast time-weighting is used.
L_{AFmax}: Maximum time-weighted sound level measured with A-frequency weighting and Fast time weighting. It is the highest level of environmental noise occurring during the measurement time. It is often used in conjunction with another noise parameter (for example L_{Aeq}) to ensure a single noise event does not exceed a limit.

L_{AFmin}: Minimum time-weighted sound level measured with A-frequency weighting and Fast time weighting. It is the lowest level of environmental noise occurring during the measurement time (time resolution is 1 s).

$L_{AF90.0}$: The noise level exceeded for 90% of the measurement period with Afrequency weighting and Fast time weighting. The level is based on statistical analysis of a parameter (LAF or LAS) sampled at 10 ms intervals into 0.2 dB wide classes. The percentage is user-definable.
An analysis of the statistical distributions of sound levels is a useful tool when assessing noise. The analysis not only provides useful information about the variability of noise levels, but is also prominent in many standards as the basis for assessing background noise. For example, L_{AF90} is used as an indicator of background noise levels while L_{AF10} or L_{AF5} are sometimes used to indicate the level of noise events.

$L_{A90.0}$: The noise level exceeded for 90% of the measurement period with Afrequency weighting. The level is based on statistical analysis of L_{Aeq} sampled at 1 s intervals into 0.2 dB wide classes. The percentage is user-definable.

$L_{AF(SPL)}$: The Sound Pressure Level (maximum time-weighted sound level during the latest second) is available at any time. 'A' denotes that the A frequency weighting is used. 'F' denotes that the Fast time-weighting is used.

L_{AFTeq}: Taktmaximal Mittelungspegel as defined by DIN 45641. L_{AFTeq} has also been called L_{AFTm5} or L_{ATm5F}.

L_{avUQ}: Average Sound Level with Time Weighting U = F or S and Exchange Rate Q = 4, 5 or 6. This is a widely used occupational health noise parameter in the USA, corresponding to the L_{Aeq} used otherwise.

L_{Cpeak}: Maximum peak sound level during a measurement. 'C' denotes that the C frequency weighting is used. Used for assessing possible damages to human hearing caused by very high short-duration noise levels.

$L_{Cpeak,1s}$: Maximum peak sound level during the latest second – is available at any time. 'C' denotes that the C frequency weighting is used. Used for monitoring the peak levels.

L_{den}, L_{day}, $L_{evening}$, L_{night}, L_n: Noise Indicators for describing the annoyance due to exposure to environmental noise.
L_{den} (day-evening-night noise indicator), L_{day} (day-noise indicator), $L_{evening}$ (evening-noise indicator) and L_{night} (night-noise indicator) are defined by the European Union. They are based on L_{Aeq} over different periods: L_{day} over the day period from 7:00 to 19:00, $L_{evening}$ over the evening period from 19:00 to 23:00, L_{night} over the night period from 23:00 to 7:00 and L_{den} over the whole day with a penalty of 5 dB(A) for the evening period and a penalty of 10 dB(A) for the night period.
L_{dn} (day-night level) is defined by the Environmental Protection Agency (EPA) in the USA as a descriptor of noise level based on L_{Aeq} over the whole day with a penalty of 10 dB(A) for night time noise (from 22:00 to 7.00).

$L_{ep,d}$: The Daily Noise Exposure Level is the average A-weighted noise exposure level for a nominal 8-hour working day. $L_{ep,d}$ is also known as $L_{EX,8h}$. $L_{ep,d}$ is calculated from the measured L_{AE}, the setting of Exposure Time and a Reference time of 8 h. Used for assessing the noise exposed to a worker during a working day – in accordance with ISO standards.
The European Noise at Work Directive 2003/10/EC defines the following limit and action values:
Exposure Limit Value: 87 dB
Upper Exposure Action Value: 85 dB
Lower Exposure Action Value: 80 dB.

$L_{ep,d,v}$: The Daily Noise Exposure Level for a user-defined reference period. $L_{ep,d,v}$ is calculated from the measured L_{AE} and the settings of Exposure Time and Reference Time. Used, for example, for calculating a Weekly Noise Exposure Level, by setting the Reference Time to 40 h.

Loudness, Loudness Level: Loudness is the subjective judgement of intensity of a sound by humans. Loudness depends upon the sound pressure and frequency of the stimulus and whether the sound field is diffuse- or free-field. The unit is the Sone.
Loudness Level = 10*log2(Loudness) + 40. The unit is the Phone.
The Zwicker method of calculation of stationary loudness based on 1/3-octave measurements is described in ISO532 -1975, Method B.

#CPeaks(>140dB): The number of 1 s peak sound levels over 140 dB. 'C' denotes that the C frequency weighting is used.
Three peak counters are available – one with a user-definable value (set to 140 dB by default), one with 137 dB and one with 135 dB value. Used for assessing possible damage to human hearing caused by very high, shortduration, noise levels.
The European Noise at Work Directive 2003/10/EC defines the following limit and action values:
Limit Value: 140 dB corresponding to 200 Pa
Upper Action Value: 137 dB corresponding to 140 Pa
Lower Action Value: 135 dB corresponding to 112Pa.

NC, NC Decisive Band: Noise Criteria is used to rate steady-state continuous noise in a room from all types of equipment, including fans, mixing boxes, diffusers, etc.
The rating is determined from 1/1-octave L_{Zeq} spectra compared with NC curves (based on equal loudness curves). The NC rating is the value of the highest NC curve 'touched' by the measured spectrum. The Decisive Band is the frequency band 'touching' the NC curve.
Defined by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers)

NCB, NCB Classification, Rumble, Hiss, RV: Balanced Noise Criteria is a refinement of NC.
The rating is determined by the SIL value and gets the Classification (R) for Rumble, if the spectrum is rich in low frequency sound (16Hz to 500Hz), the Classification (H) for Hiss, if the spectrum is rich in high frequency sound (1 kHz to 8 kHz), or the Classification (RV) for Vibration and Rattle if the spectrum at low frequencies (16Hz to 63 Hz) is likely to produce audible rattling in lightweight building elements.
The details of the NCB rating are defined in ANSI S12.2-1995

NR, NR Decisive Band: Noise Rating rates noise levels at public or private indoor areas.
The rating is determined from 1/1-octave L_{Zeq} spectra compared with NR curves (based on equal loudness curves). The NR rating is the value of the highest NR curve 'touched' by the measured spectrum. The Decisive Band is the frequency band 'touching' the NR curve.
Defined in ISOR1996(1971)

Occupational Health Standards: Typical Setup Parameter settings for Occupational Health measurements in accordance with various standards:
• OSHA (Occupational Safety and Health Administration) – 29 CFR1910.95
• MSHA (Mine Safety and Health Administration) – 30CFR62.0UMHRPEL
• DOD (Department of Defence) – DoD Instruction 6055.12
• ACGIH (American Conference of Government Industrial Hygienists) – DHHSPub 98-126
• ISO – UK Noise at Work Regulations SI 1989/1790 amended by SI 1992/ 2966 and SI 1996/341

Setup Parameters OSHA MSHA DOD ACGIH ISO
Broadband (excl. Peak
Broadband Peak
Exposure Time Reference Time (Preset)
Reference Time (user-definable)
Threshold Level
Criterion Level
PeaksOver Level$_a$
Exchange Rate for Lav
Weighting for Lav

Reference Time: Reference Time is used for calculation of Sound Exposure Level $L_{ep,d,v}$ or Time Weighed Average TWA_v with a reference time other than 8 hours.

RC, RC Classification, Rumble, Hiss, RV: Room Criteria is for rating room noise.
The rating is determined based on the PSIL value and gets the Classification (R) for Rumble, if the spectrum is rich in low frequency sound (16Hz to 500 Hz), the Classification (H) for Hiss, if the spectrum is rich in high frequency sound (1 kHz to 4 kHz), the Classification (N) for Neutral if it is not (R) or (H), or the Classification (RV) for Vibration and Rattle if the spectrum at low frequencies (16Hz to 63 Hz) is likely to produce audible rattling in lightweight building elements.
The rating is defined in ANSI S12.2-1995

SIL, PSIL, SIL3: SIL (Speech Interference Level) is the arithmetic average of the 500 Hz, 1 kHz, 2 kHz and 4 kHz octave band levels.
PSIL (Preferred Speech Interference Level) is the arithmetic average of the 500Hz, 1 kHz and 2 kHz octave band levels.
Used for evaluating the interference of noise upon speech communication.
SIL3 (Speech Interference Level based on highest 3 octaves) is the arithmetic average of the 1 kHz, 2 kHz and 4 kHz octave band levels.

Note: Though SIL, PSIL and SIL3 are defined for octave band levels they are also calculated for 1/3-octave band levels by summing the power values in the three bands within each octave before doing the averaging.

Sound: Any pressure variation that the human ear can detect. Just like dominoes, a wave motion is set off when an element sets the nearest particle of air into motion. This motion gradually spreads to adjacent air particles further away from the source. Depending on the medium, sound extends and affects a greater area (propagates) at different speeds. In air, sound propagates at a speed of approximately 340 m/s. In liquids and solids, the propagation velocity is greater – 1500 m/s in water and 5000 m/s in steel.

Sound level or sound pressure level: The level in decibels of the pressure variation of a sound. See also **decibel**.

Std.Dev. The Std.Dev. is calculated as the Standard Deviation of the noise samples used for statistics. This is either L_{AF} or L_{AS} sampled every 10 ms, or L_{Aeq} sampled every second.

T_{Cpeak}: The time when the peak sound level occurred. 'C' denotes that the C frequency weighting is used.

Threshold Level: Any sound levels below the threshold level do not contribute to the Dose measurement data. For example, if you set the threshold level to 80, any sound levels below 80 dB are not taking into consideration by the instrument, when it calculates doses and time weighted averages.
Used for calculation of Dose, ProjDose, TWA, TWA_v DoseSQ, ProjDoseSQ.

TWA: The Time Weighted Average is the average A-weighted sound level for a nominal 8-hour working day with Time Weighting S and Exchange Rate 5. TWA is calculated from the measured LavS5 (taking Threshold Level into account) and a Reference time of 8 h. Mainly used in the USA for assessing the noise exposure for a worker during a working day.

TWA_v: The Time Weighted Average for a user-defined reference period. TWA_v is calculated from the measured LavS5 (taking Threshold Level into account) and the Reference Time. Used, for example, for calculating a Weekly Time Averaged Level by setting the Reference Time to 40 h.

Z-weighting: 'Zero' frequency weighting is without any frequency weighting, that is, equivalent to Linear, LIN or FLAT