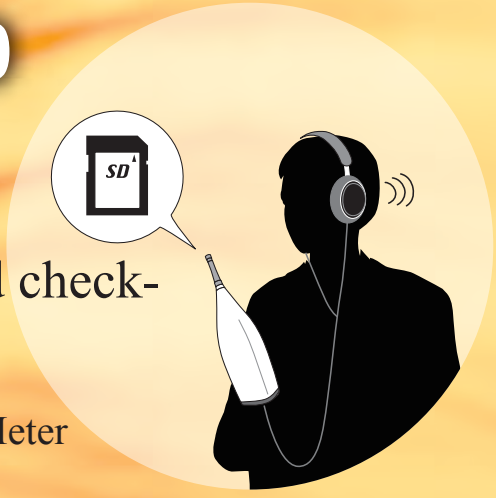
Sound Level Meter

LA-3570/3560/3260



Measure, listen, record and check-
all with the same device

Perform more than a sound Level Meter

CE

Class 1
LA-3570

Class 1
LA-3560

Class 2
LA-3260

ONOSOKKI

LA-3000 series Sound Level Meter

You can now measure while listening, and record and check all with the same device

Overview

The LA-3000 series are cost-effective sound level meters that come standard with a headphone output and an auto memory function. By adding a wide range of options, you can upgrade the models into higher-performance equipment to serve as analyzers, recorders, comparators, and loudness meters. These sound level meters bring about innovation to field measurements.

Features

- Large easy to see screen.
  Direct keys for easy operation.
- Linearity range of 110 dB
- Can make measurements from some distance away from a sound source while audibly monitoring it.
- Quad-channel screen (Up to four different calculation results can be displayed simultaneously.)
- Conform to IEC 61672-1 and JIS C1509-1.

Lineup

LA-3570 Class1 High-sensitivity type
Recommended for measuring faint sounds in an anechoic chamber or similar environment

LA-3560 Class1 Wide band type
Recommended for making measurements across the entire audible range

LA-3260 Class2
Recommended for measuring environmental noise up to 8 kHz

The adoption of direct keys makes it easy to change settings with the help of on-screen measurement guidance.

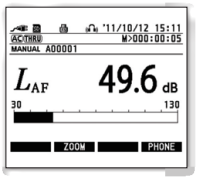
- A, C and Z frequency weightings selectable
- F, S, I and 10-ms time weightings selectable
- Recalling stored data and conditions

Large 3.5-inch screen

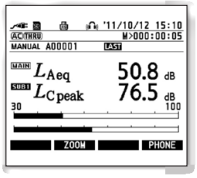
Numerical values and waveforms are very easy to see.

Three measurement screen formats (example)

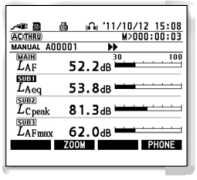
With varying combinations of frequency weightings (A/C/Z) and time weightings (F/S/I/10 ms), the results of your required calculations can be displayed simultaneously.



Single
(Large display of one calculation)



Dual
(Simultaneous display of two calculation results)



Quad
(Simultaneous display of four calculation results)

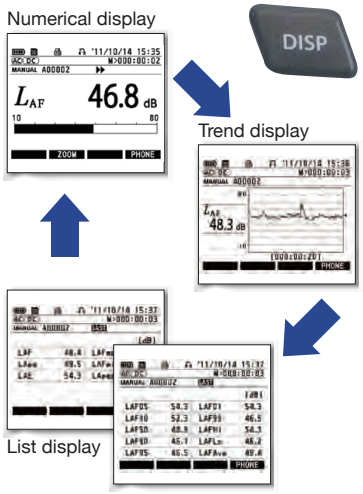
Supports SD/SDHC card

Supports high volume memory (up to 32 GB)
*Please contact your nearest distributor for more details about recommended cards.

Two outputs are possible at a time

- AC-out (main frequency weighting) fixed
- Selectable from among DC, AC-Z, or Through

Easy display selection



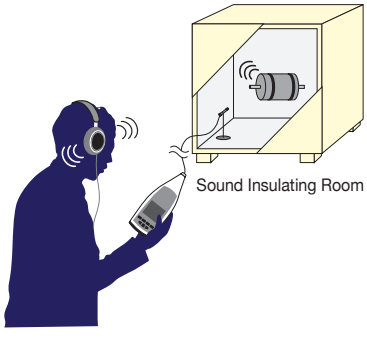
Auto memory and manual memory are provided as standard.

In addition to manual memory, auto memory is provided as standard. And by adding a sound recording function (option), you can record live sound.

Headphone output (Phone output)

You can measure an object placed in an anechoic chamber or a sound insulating box while listening to its sound.

*Headphones and extension cable are sold separately.



With the addition of options,

the Sound Level Meter evolves into varied products!

Sound Analyzer

By means of real-time octave analysis and FFT analysis, you can determine where a particular distinctive sound occurs along the frequency of a measuring sound. The use of bandpass-filter is effective in a sound source probing.

Sound Comparator

With the help of instantaneous value and Leq*, you can make OK/NG judgments on products. Well-suited for embedding into equipment used on production lines.

*Equivalent Continuous Sound Pressure Level

Sound Recorder

The Sound Level Meter serves as a sound recorder. Adding playback function lets you check whether the recording of a measurement sound has been securely made.

(Sampling frequency: 64 kHz, WAVE file)

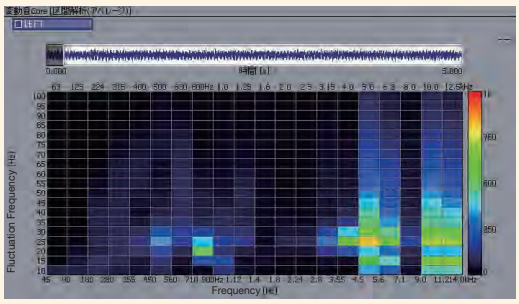
Loudness Meter

In addition to LAeq* display, you can see loudness values more in line with the auditory sensitivity of the human ear can be displayed. This feature is useful in making auditory evaluations.

*Equivalent Continuous A-weighted Pressure Level

For more detailed analysis

Analysis_OS-2000 series



Example of fluctuation Sound Analysis

◯ Waveform Analysis

By reading in a WAVE file, you can perform various off-line analyses. By using an IIR filter (option), you can listen to sound coming out of the filter while playing back a recorded sound.

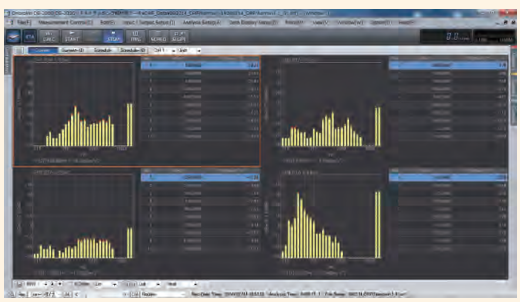
◯ Sound Quality Evaluation

The results of non-stationary loudness analysis can be displayed in various kinds of graphs including color map. It is possible to analyze even more complicated sound quality analyses such as sharpness analysis and roughness analysis.

◯ Fluctuation Sound Analysis

This analysis method can detect a low-level time fluctuating sound (such as a rattling sound), which is difficult to detect by FFT analysis. The two axes (sound timbre and variable period) make it possible to display the time fluctuating compose clearly.

Analysis_DS-3000 series



◯ FFT and 1/N octave analysis software

By reading in WAVE data derived from an LA-3000 series, FFT analysis, 1/N-octave analysis and similar analysis can be performed offline. For example, a non-stationary signal can be analyzed in detail in time-frequency 2-axis color map.

◯ As a signal source to the DS-3000 series

Real-time analysis can be perfomed by using an analog output from the LA-3000 series, in place of a microphone. Since the LA-3000 series can output two kind of signals (A-weighting and Z-weighting) simultaneously, both signals can be analyzed at the same time using the DS-3000.

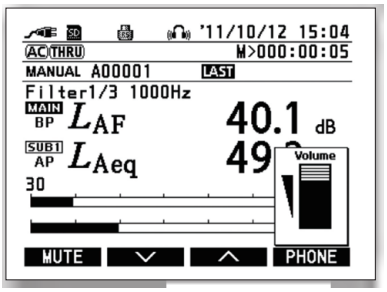
Wide range of options

1/1 Real-time Octave Analysis Function : LA-0351
1/3 Real-time Octave Analysis Function : LA-0352

Filter1/1、Filter 1/3 mode

<The use of headphones helps to perform sound probing of a specific sound, such as an unusual noise>

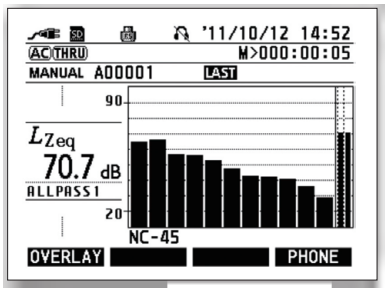
In Filter1 mode, you can make level evaluations in a single frequency band. By focusing solely on a particular frequency band in which a specific unusual noise occurs and measuring the sound pressure level, you can find where the noise is coming from. While wearing the headphones, you can listen to sounds only in the frequency band you selected. At this time, switchover to level display or trend display is also possible.

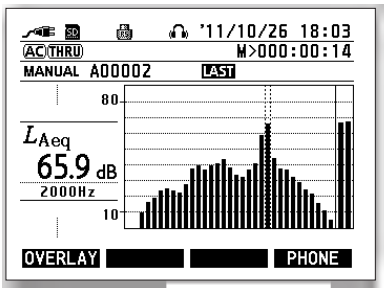


1/1 Real-time Octave Analysis, 1/3 Real-time Octave Analysis mode

<Useful for evaluating frequency components when there is unusual noise>

By dividing a sound in terms of pitch (into frequency bands), this feature helps to analize at which pitch (frequency band) certain distinctive features occur, as well as for making detailed comparisons.





Applicable standards : IEC 61260: 1995 Class 1,
JIS C1513: 2002 Class 1,
JIS C1514: 2002 Class 1

Analysis modes : Octave filter analysis mode,
Real-time octave analysis mode

Analysis bands : 16 Hz to 16 kHz in 11 bands (in 1/1 octave)
12.5 Hz to 20 kHz in 33 bands (in 1/3 octave)

Measurement items : Octave filter analysis mode
Lp, Leq, LE, Lmax, Lmin or LN of a selected band filter and AP
Real-time octave analysis mode
Lp, Leq, LE, Lmax, Lmin or LN of each band filter and AP1, AP2
NC values
(1/1 octave only, displayed on RTA screen)

Frequency weighting and time weighting : Octave filter analysis mode
Applicable to BP (band-pass) and AP (all-pass), each
Real-time octave analysis mode
Applicable to each frequency band and AP1, AP2

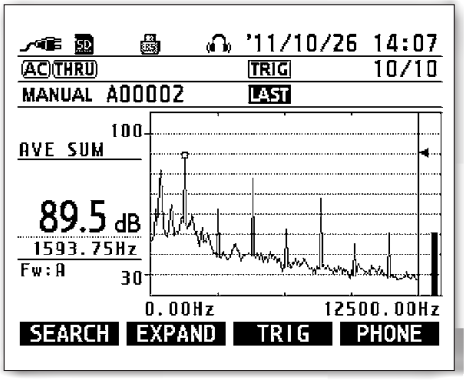
Display format : Octave filter analysis mode
Values (BP, AP), list
Real-time octave analysis mode
Bar graph (Values for a selected band, AP1 and AP2 included in frequency axis), list

Overwrite display function : "Stored data" and "measurement-in-progress data" (Real-time octave analysis only)

FFT Analysis Function: LA-0353

<Suitable for analyzing a single-shot sound>

Adding the FFT analysis function makes it possible to perform narrow-band analysis, not only with the magnitude of sound but also with its pitch (frequency). An averaging function is effective for analysis of stationary sound by making waveforms stable. Moreover, the use of a trigger function makes it possible to capture single-shot sounds. A window function serves as a rectangular window function when a trigger is set, thereby making it easy for the user to make measurements in a user-transparent manner. By virtue of 64-kHz sampling, 25-kHz wide-range analysis is also possible. Pressing the DISP key displays a peak list.



Number of analysis lines : 400 lines
X-axis enlargement function : x1, x2, x4
Frequency range : 1 kHz, 2.5 kHz, 5 kHz, 12.5 kHz, 25 kHz
Search function : with high-speed movement search cursor function
Calculation item : Instantaneous value, power averaging
Waveform averaging function : SUM (power summation averaging), MAX, Hold, EXP
Trigger : Type Internal trigger (Mode: Repeat)
Target Lp values with the following conditions ;
Frequency weighting…Set on the main screen
Time weighting…10ms fixed
Position Fixed 64 pretrigger points
Window function : Hanning/rectangular (Trigger off : hanning
Trigger on : rectangular)
Display (frequency axis) : Trigger off : Each frequency band, OA (overall), and AP (AVE off:LP/AVE on*: Leq or Lmax)
*depending on the setting of AVE on mode.
Trigger on : Each frequency band, OA, AP (Lq)
Peak list Top 10 points
Memory mode : Manual

Sound Recording Function: LA-0354

<On-site recording to an SDHC card, on-site checking of those recordings via headphones>

It becomes possible for you record any unusual sounds that you may hear on site into an SD/SDHC card in WAVE format. And since you can play back those recordings on the sound level meter, you can also check that recordings have been made without fail on site.
You can also save trend data at the same time by allowing the playback of long-duration data recordings. With instantaneous display of this data at the time of reproduction, you can quickly find a distinct sound and start playing back from that point in time.

The OS-2000 series (option) is useful for off-line analysis of recorded sound data.

Stored data : Noncompressed (wave format) audio data

Frequency range	AP/specified bands (in Filter mode only)
File format	Wave
Frequency weighting	Z-weighting
Sampling frequency	64 kHz
Audio data bit	16 bits
Reference Lp data	Type ... Lp values of noncompressed audio data File format ... CSV Sampling ... 1 sec.

Simultaneous saving : Simultaneous saving is possible with the auto memory function (with some restriction on settings).

Storage media : SD/SDHC card, up to 32 GB of memory
(The maximum file size is 2 GB.)
*Up to 4 hours of recording is possible with 2 GB in 16-bit format.

Recording mode : Start-activated recording:
Recording starts/stops in step with measurement.
A single file is created for the duration of total measurement time.
(Unless otherwise specified, same as measurement time.)
Threshold-activated recording:
A recording takes place only for a length of time during which a sound level exceeds a threshold. Every time it exceeds a threshold, a single file is newly created.

Pre-recording function : Recording begins one second before the start of each recording operation.
(This function is operative in level-start or threshold-activated recording mode.)

Playback function : Trend data updated every second
Phone output

Comparator Function : LA-0355

<Possible to make OK/NG judgments on products>

To allow creation of a system with other equipment on a production line, you can make settings for hold time and delay time of output signal.

Available item : Lp, Leq, LE, Lmax, Lpeak
Judgment hold time : 0.1 s , 0.2 s , 0.5 s , 1 s , 5 s , 10 s , 30 s , MANUAL
Extended time setting : OFF , 10 ms , 100 ms , 1 s , 2 s , 3 s , 5 s , 10 s
Output : Open collector
OFF / positive logic / negative logic

Interlocking on/off function with an external power supply : LA-0357

<The Sound Level Meter can be turned on/off in sync with external power>

The power supply on/off of the sound level meter is interlocked with the main power supply of the production lines.
Combined use with the comparator function is useful to build devices for OK/NG judgment in production lines.

Function : When power is supplied from the AC adaptor, the main unit starts up automatically. When the power is shut off, the main unit turns off. The power switch on the main unit remains operative.
* When this function is installed, the Sound Level Meter does not operate on battery power.

Data Logging Function : LA-0356

<Enables to store instantaneous values in CSV format at short time intervals.>

Instantaneous values can be stored into an SD/SDHC card in CSV format.

Storing interval : 10 ms, 100 ms
Available item : Lp (instantaneous value)
Simultaneous storing : Enables simultaneous storing with auto memory function (with some restrictions on setting)

Loudness Calculation Function : LA-0358

<Performs more than the sound level meter>

As for noise-level evaluations, there are cases where measurement results are not in tune with the auditory sensitivity of the human ear. In such cases, assessment using loudness values that provide one of the indexes of sound quality evaluation becomes a highly effective tool. Loudness calculation refers to an index used for evaluating the human perception of the magnitude of sound in accordance with DIN45631.
The LA-0358 loudness calculation function is designed to work on non-stationary sounds.
The OS-2000 series is usable for the Loudness calculation of non-stationary Loudness.

Subject model : LA-3560, 3570

Peripherals

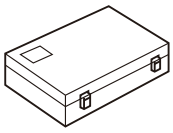
Windscreen

standard

● Windscreen (Φ70 mm)

Carrying case

standard



Battery cell

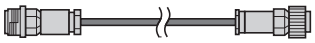
x 4 pieces

Instruction manual

Extension cable for microphone

option

AG-3400 series extension cable (Compliant to CE marking)



AG-3401	5 m
AG-3402	10 m
AG-3403	20 m
AG-3404	30 m

Sound Calibrator SC-3120/2120A

option

Compliant with JIS C1515: 2004, these sound calibrators are essential equipment for noise measurements. The SC-3120 is a Class 1/C-rated piston phone-type sound calibrator. It delivers sound pressure of 114 dB at 250 Hz. Please use the SC-3120 with the LA-3000-series Sound Level Meters that are compliant with JIS C1509. The SC-2120A is a Class 2-rated speaker-type calibrator that generates sound pressure of 94 dB at 1 kHz.

Tripod LA-0203C

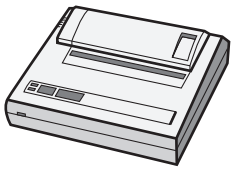
option

This is Ono Sokki's standard tripod for use with our sound level meter. The maximum height is 161.5 cm and minimum height can be reduced to less than 10 cm by reversing the tripod and attaching the center pole to the sound level meter.

(SPLINT PRO II GM made by SLIK Corporation)

Printer RS-232C Thermal printer DPU-414

option



*An AC adapter is sold separately.

Interface printer with RS-232C connector. Enables manual printing, auto printing and memory printing are possible. Connection cable (AX-5042) between the LA-3000 series and the printer is provided as standard accessory.

AC adapter : PW-4007J (100-120 VAC)
or PW-4007E (220-240 VAC)
Recording paper : CX-050B (30 m/roll, 10 rolls/box)

Headphone

option

<Recommended headphone>
MDR-7506
made by Sony Corporation

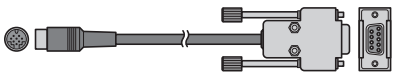
SD card 1 GB

standard

SDHC card
(up to 32 GB of SDHC card is available, sold separately.)

RS-232C cable 2 m AX-5022

option



PC side (D-SUB 9-pin)

AC adapter PB-7090

standard

Input voltage:100 to 240VAC 50/60 Hz

*Please specify the input voltage of the AC adapter depending on your usage.

*AC adapter (made by Adapter Technology Co., Ltd)

Output voltage : 5.9VDC
Output connector : EIAJ RC-5320A, voltage category 2
Rated output current : 3.5 A
Total length : 3.5 m

USB cable

option

<Recommended USB cable>
USB-FSM518:USB (A) male-USB (miniB) male cable
made by ELECOM CO., LTD

Signal cable 2 m AX-501

standard

Φ2.5 micro mini plug

A cable for AC/DC signal output, comparator output, and external control signal input.

Basic Specification

		LA-3570	LA-3560	LA-3260
Applying standard		JIS C 1509-1:2005 Class 1 IEC 61672-1:2002 Class 1		JIS C 1509-1:2005 Class 2 IEC 61672-1:2002 Class 2
Measurement range (IEC, JIS)		A:22 to 130 dB C:28 to 130 dB Z:36 to 130 dB	A:27 to 140 dB C:32 to 140 dB Z:38 to 140 dB	A:26 to 140 dB C:30 to 140 dB Z:36 to 140 dB
Intrinsic noise		A:14 dB or less C:20 dB or less Z:28 dB or less	A:19 dB or less C:24 dB or less Z:30 dB or less	A:20 dB or less C:24 dB or less Z:30 dB or less
Frequency range (IEC, JIS)		10 Hz to 15 kHz	10 Hz to 20.0 kHz	10 Hz to 8.0 kHz
Microphone		MI-1211 1/2-inch bias type	MI-1235 1/2-inch electret type	MI-1433 1/2-inch electret type
	Sensitivity level (re. = 1 V/Pa)	-20 dB ±1.5 dB	-29 dB ±3 dB	-29 dB ±3 dB
Microphone preamplifier		MI-3310	MI-3230	
Linearity range		Wide range: 110 dB / normal range : 80 dB		
Level range		7 ranges 20 to 120 dB/ 50 to 120 dB / 40 to 110 dB / 30 to 100 dB / 20 to 90 dB / 10 to 80 dB / 0 to 70 dB	7 ranges 30 to 130 dB / 60 to 130 dB / 50 to 120 dB / 40 to 110 dB / 30 to 100 dB / 20 to 90 dB / 10 to 80 dB	
Reference range		50 to 120 dB		
Time weighting		F (fast), S (slow), I (impulse), and 10 ms		
Frequency weighting		A, C and Z		
Measurement items		L_p, L_{eq}, L_E, L_{peak}, L_{max}, L_{min} L_N (L_{H1}, L_5, L_{10}, L_{50}, L_{90}, L_{95}, L_{LO}, L_{AV}, and two more any L_N data)		
Sampling interval		15.6 µs (L_p, L_{eq}, L_E, L_{max}, L_{min}, L_{peak}), 100 ms (L_N)		
Measurement (calculation) time		Manual (0 sec.), user-specified setup: 0.1 to 199 hr. 59 min. 59.9 sec. resolution : 0.1 sec		
Total time		0 sec. to 199 hr. 59 min. 59.9 sec. resolution : 1 sec		
Interval time		1 min. to 24 hr. resolution : 1 min		
Start mode		Manual start, timer start, count down start, level start, external control (shunts the external control terminal)		
Dual mode function		Provided as standard (simultaneous measurement of 2 kinds selected from 3 conditions of frequency weighting x 4 conditions of time weighting)		
Quad function		Provided as standard (simultaneous measurement of 4 kinds selected from 3 conditions of frequency weighting x 4 conditions of time weighting)		
Display device		3.5” LCD with white backlight		
Digital display		4-digit / resolution 0.1 dB / updated every 1s		
Bar indicator		Wide range: 100 dB of display range Normal range: 70 dB of display range		
Remaining battery level display		4-step display		
Memory function		Stored in an SD/SDHC card (SDHC card: up to 32 GB is available.)		
	Mode	MANUAL, AUTO (instantaneous value, calculated value), RECORD (WAVE file, 64 kHz sampling)...required for the LA-0354, LOGG10, LOGG100		
Panel condition memory		Panel Condition (SD/SDHC) power off memory		
Basic measurement mode		5 modes (EZ1:L_{Aeq} + L_{Cpeak} / EZ2: Record / EZ3: Logging 100 ms / EZ4: NC / EZ5: Loudness		
Clock function		Built-in (Year / month / day / hour / minute), retention time of content: approx.5 years (charging time: 24 hours from entirely open state)		
Backup function		Stores measurement conditions into the built-in memory		
Calibration signal		Electronic calibration by built-in transmitter (1 kHz sine wave) Normal range: -6 dB of full-scale wide range : -16 dB of full-scale		
Recommended calibrator		SC-3120		
Phone output (headphone output)		Actual sound or recorded sound (playback sound) *Selected 1 band of actual sound or recorded sound (playback sound) in 1/1 or 1/3 filter mode when the option (LA-0351/0352) is installed. Maximum output: 10 mW (63 Ω at 1 kHz), connector: stereo ϕ3.5)		
AC output		Outputs one of A, C, or Z interlocked with the setting selected on the main display, update interval:15.6 µs		
	AC output level	Output level: 0.707 Vrms ± 5 % (normal range), 2.234 Vrms ±5 % (wide range) Output impedance 50 Ω±2 % / load resistance 10 kΩ or more/ offset voltage ±10 mV or less		
AC/DC output		Selectable from DC, AC-Z or Through		
	DC output level	2.5 V ±20 mV (normal range), 2.5 V±10 mV (wide range), scale factor 0.25 V ±10 mV/10 dB		
	AC-Z output level	Output level: 0.707 Vrms (normal range), 2.234 Vrms (wide range) Output impedance 50 Ω±2 %, load resistance 10 kΩ or more, offset voltage ±10 mV or less		
	Through output level	Output level: 0.707 Vrms ±5 % (normal range, wide range) Output impedance 50 Ω±2 %, load resistance 10 kΩ or more, offset voltage ±10 mV or less		
Comparator output		Outputs the status in open collector signal after comparing the setup value with the calculated value. (required for the LA-0355)		
External control input		Operation: Reset and start control voltage: non-voltage contact input, input pulse width: 200 ms or more, absolute max. input voltage: 24.0 V		
Interlocking on/off function with an external power supply		The main unit is activated automatically when the power is supplied from an AC adapter. (required for the LA-0357) When this function is installed, the LA-3000 series do not operate on battery power.		
Interface	RS-232C	Baud rate: 9600, 115200 bps, AX-5022 cable (sold separately)		
	USB	Compliant with USB storage class specification ver. 1.1, USB connection cable :USB (A) male-USB(mini-B 5-pin) male (sold separately)		
	External memory	SD/SDHC memory card (up to 32 GB is available)		

	LA-3570	LA-3560	LA-3260
Microphone extension *1	103 m (CE marking compliant: up to 30 m)		
Power supply	Type AA battery (alkaline battery cell or rechargable battery cell) x 4 pieces or AC adapter (PB-7090 ... power consumption: approx. 7 VA when AC100V in used)		
Battery life (continuous use)*2	Alkaline battery cell LR6 : approx. 8 hours Ni-MH secondary battery : approx. 8 hours		
Operating (storage) temperature range	-10 to 50 ℃ (20 to 60 ℃)		
Operating (storage) humidity range	22 to 90 % RH (10 to 90 %RH) with no condensation		
Outer dimensions	Approx. 379 (H) x 106 (W) x 49.3 (D) mm	Approx. 311 (H) x 106 (W) x 49.3 (D) mm	
Weight	Approx. 680 g (including batteries)	Approx. 630 g (including batteries)	
Accessories	AC adapter (PB-7090), signal cable (AX-501), windscreen (Φ70mm), hand strap, alkaline type AA battery x 4 pieces, carrying case (including shoulder belt), SD memory card (1 GB), instruction manual		

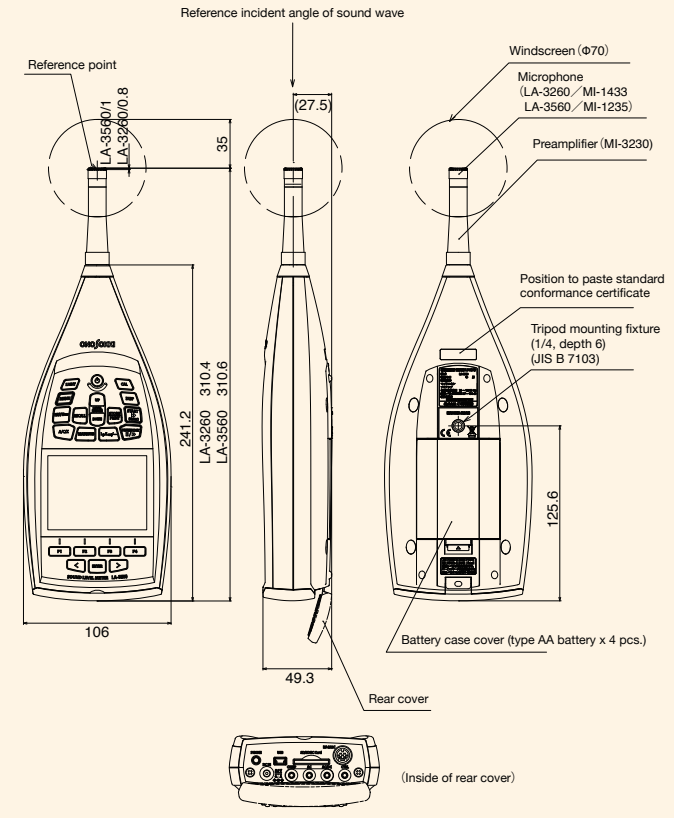
Please use a recommended SD card when you use an optional function. For more details about the recommended SD card, please contact your nearest distributor or send an e-mail (overseas@onosokki.co.jp) to us.

*1.The described value is extendable length when the exclusive cable is used.
*2. It depends on the using status such as operation mode, memory mode, and backlight.

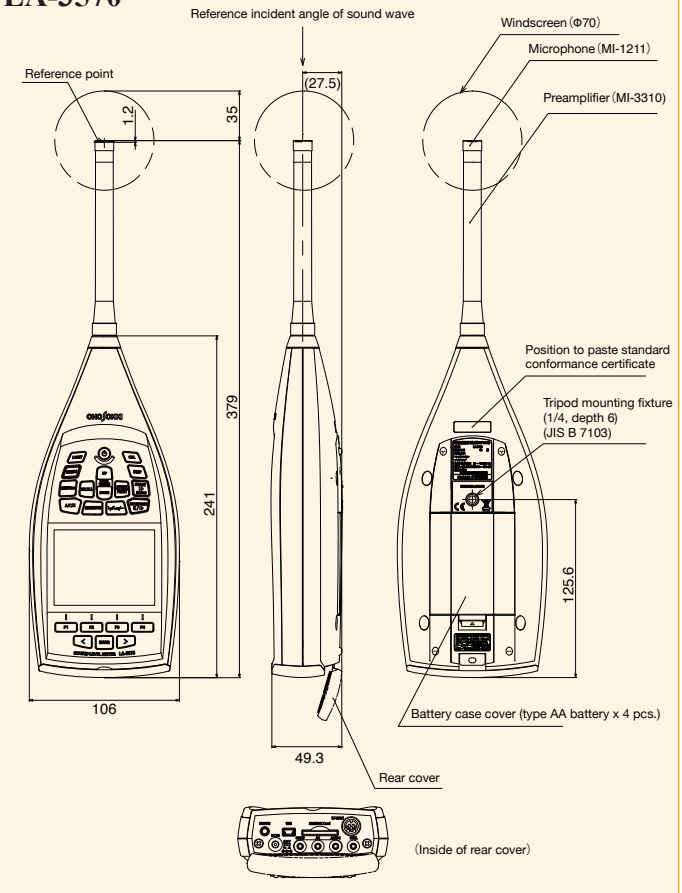
Outer Dimensions

(Unit : mm)

LA-3560
LA-3260



LA-3570



ONO SOKKI

*Outer appearance and specifications are subject to change without prior notice.
URL: http://www.onosokki.co.jp/English/english.htm

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PRINTED WITH SOY INK Recycled Paper

CAT. NO. 1652-02E Printed in Japan 121 (LI) 1K