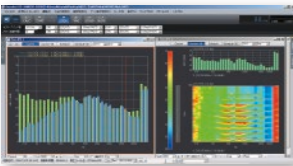## Products for further analysis
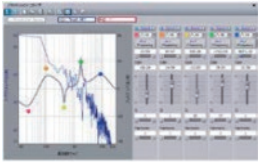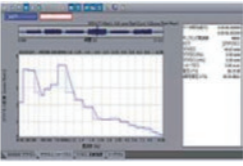
Offline Software for analysis

●DS-3000

The DS-3000 can import the WAVE file which has been recorded by LA-7000 series and LA-0704, and perform FFT analysis offline. The unit is automatically calibrated at the time of installation.
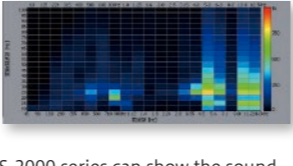
●IIR Filter (OS-2000 series)

The OS-2000 series can import the WAVE file which has been recorded by LA-7000 series and LA-0704. You can hear the change by increasing or decreasing the frequency level.

●Sound Quality Evaluation (OS-2000 series)

The sound quality evaluation software can import the WAVE file which has been recorded by LA-7500 and LA-0704, and calculate the loudness, non-constant loudness, sharpness, and fluctuation strength.

●Fluctuation Sound Analysis (OS-2000 series)

OS-2000 series can show the sound feature by two parameters of frequency and fluctuation frequency. This software enables wide freuency range of sound quality evaluation that cannot be performed by "roughness" and "fluctuation strength" fields.

Sound Source Visualization System BF-3200, MI-5420A etc.

Monitor camera
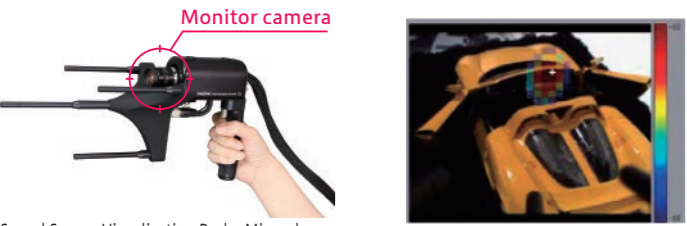
Sound Source Visualization Probe Microphone

The sound source visualization system has more advanced function than the LA-7000 series, which identifies and visualizes the sound that you are curious about.(frequency of the 1/3 octave bandpass filter)

Acoustic sensor (microphone, preamplifier) MI series

●MI-1271+MI-3170
1/2-inch High performance microphone
(Operating temperature：-30 ℃ to 80 ℃)
(Frequency range：1 Hz to 20 kHz)
(Inherent noise A-weighting：14 dB)

●MI-1235 + MI-3111
1/2-inch Microphone for general usage
(Equivalent to Class1, 10 Hz to 20 kHz)

●MI-1433 + MI-3111
1/2-inch Microphone for general usage
(Equivalent to Class1, 20 Hz to 8 kHz)

●MI-1531 + MI-3140
1/4-inch High performance microphone
(1/4-inch diameter, 10 Hz to 100 kHz)

Sound Level Meter LA-1411/1441A/4441A

This series has simple function which measures the sound level, equivalent continuous sound level(L_{eq}), sound exposure (L_E), maximum, minimum, peak level(L_{peak}), percentile noise level (L_N) etc. Recommended calibrators (Class1 and Class2) are also provided.

●LA-4441A (IEC 61672-1 Class 1)
●LA-1441A (IEC 61672-1 Class 2)
●LA-1411 (IEC 61672-1 Class 2)
*Extension(BNC) cable for microphone is sold separately.

*To upgrade the sound level meter after purchase, register the product on the user registration page and download the latest version.
To add options, upgrade the sound level meter to the latest version.

Reliable and high level calibration JCSS*¹ Accredited Calibration Laboratory

Ono Sokki provides reliable and high level calibration as "Accredited Calibration Laboratory", which is certificated by JCSS calibration laboratory accreditation system, based on the skills and know-how of quality assurance system which has been acquired through many years of practice. Under the JCSS of calibration laboratory accrediation system, Ono Sokki is assessed and accredited as Accredited Calibration Laboratories to meet the requirements of the Measurement Law, relevant regulations and ISO/IEC.

*1: JCSS (Japan Calibration Service System)
*2 ilac: International Laboratory Accreditation Conference
*3 MRA: Mutual Recognition Arrangements

Accreditation Scope
●Acoustics & Ultrasound
●Acceleration
●Torque
●Fluid flow
●Electricity (Direct Current & Low Frequency)
●Speed

ilac-MRA IA-Japan JCSS
JCSS 0170

Ono Sokki can issue the calibration certificates with the JCSS accreditation symbol, which assures the traceability to National Measurement Standards as well as a laboratory's technical and operational compentence, and is acceptable in the world through the ilac*²-MRA*³.

★Windows® and Microsoft® Excel® are trademarks or registered trademarks of Microsoft Corporation in the United States and other countries.
★Other company names, product names are registered trademarks or tradmarkes of each company.

An eco-friendly waterless printing method was used which does not yield harmful waste water.
VOC free ink was used to print this report.

CAT.NO.1643-05E Printed in Japan 19X（LI）0.3K

Sound Level Meter

LA-7000 series

Listen, measure, and identify the sound.

ONO SOKKI

Easy to operate

4.3 inch color LCD

Clear and easy to see a display of overlapping.
When the instantaneous value exceeds, the bar graph turns red and the letter of OVER is left as a measured history.
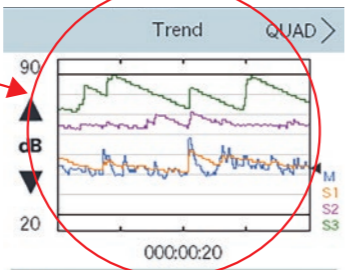
Starts recording with one-touch operation

Calculation and recording are started just by tapping ▷ button(for auto memory) with a finger.

Listening function

You can measure while listening to the sound.
It enables you to realize and experience the sound, not only as simple numerical values but also as a real feeling. Moreover, you can listen to only the intended sound more clearly through filtering by bandpass filter.
By aiming the microphone (sound level meter) toward the direction where the sound is heard loudly, the sound probing is easily performed.
(Refer to the Function page.)

Easy to hold

Downsized

Compact

Achieves 35 % of size-reduction in volume of conventional model. Easy-to-hold design.

Short lanyard for portable use

The short lanyard provided as an accessory prevents the sound level meter from slipping down.

Slim

Movie of operation image

Bottom cover removable

Easy to use

High sensitivity type
Recommended for small sound measurement such as in an anechoic room.
LA-7500   IEC 61672-1:2013 Class 1
            10 Hz to 20 kHz

High function type
Recommended for environmental noise measurement where high function is required.
LA-7200   IEC 61672-1:2013 Class 2
            20 Hz to 8 kHz

Intuitive operation by a touch panel

It provides intuitive operation in easily understandable manner by even a beginner touching the sound level meter for the first time. You can select and change items on the display including calculation, range, measurement time by tapping the panel.

Language selection

Language used on the display (menu, error message etc.) is selectable (English/Japanease).

USB power supply allows long time measurement

Approx. 12 hours of continuous operation by alkaline battery cells(depends on the selected mode). Longer continuous operation is allowed by USB bus power.
USB gets preference over battery cells when both USB and battery cells are used together. The battery power supply is automatically selected by removing USB connection.

Windscreen correction function

When measuring with windscreen, the influence of the attachment can be corrected by this function.
*Applicable to IEC 61672-1 with a state a windscreen attached.
*The use without a windscreen correction is available.

Example of a screen captured

Capturing function

Captures the displayed screen by pressing Power key and Home key simultaneously.

Home key leads you to return to the first page

Pressing Home key returns the display to the home screen. Helpful to go back to the home screen quickly from the deep hierarchy that you are operating.

External power supply ON/OFF function

When the LA-7000 series is used being incorporated in equipment, the ON/OFF power operation can be interlocked to an external power supply.
* The battery cells should be removed.

MULTI I/O	: MULTI I/O connector
SD CARD	: SD card slot
USB	: USB connector
AC/DC OUT	: AC/DC output connector
AC OUT	: AC output connector
CTRL IN	: External control input connector
PHONE	: Headphone monitor output connector
DC IN	: External power supply input connector

Sound level meter advancing with additional function

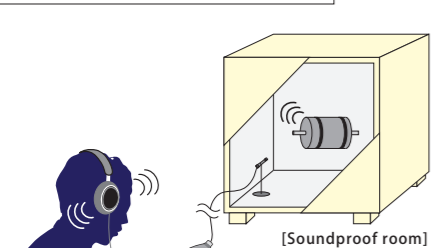1/1 Octave band function which is effective for noise countermeasure is provided as standard.
High cost-effective, high performance, and continues to advance sound level meter by adding further optional functions.

Standard function

DUAL mode, QUAD mode

Two (DUAL) or four (QUAD) of calculation values in the combination of various frequency weightings and time weightings can be displayed simultaneously. Useful when displaying several kinds of frequency weightings.

[Soundproof room]

Sound Listening

Listening function（Phone output）

Measuring while listening to the sound
●Effective for the measurement in an anechoic room or distant place
●Effective for monitoring of environmental noise etc. at distant place

*Extension cable, headphone: sold separately

Standard function | 1/1 Octave Band Analysis Function

Applicable standard: IEC 61260-1: 2014 Class1/ JIS C 1513-1: 2002 Class1, JIS C 1514-1: 2002 Class 1
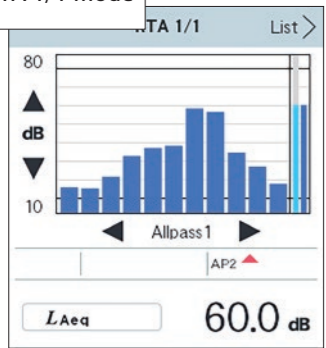Analysis band: 16 Hz to 16 kHz (11 bands), Allpass 1, 2
Measurement item: Filter Mode (Bandpass, Allpass)···L_p, L_{eq}, L_E, L_{max}, L_{min}, L_{peak}, (L_N list)
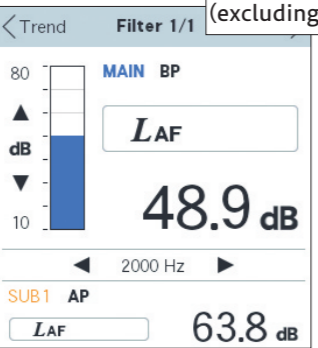RTA Mode···L_p, L_{eq}, L_E, L_{max}, L_{min} (Main)
Measurement range: Normal range (Wide range: not supported)
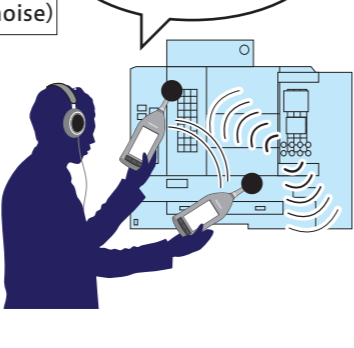Memory mode: Manual, Auto, Logging, Record (LA-0704 is required.)

RTA 1/1 mode

Filter 1/1 mode
(excluding abnormal noise)

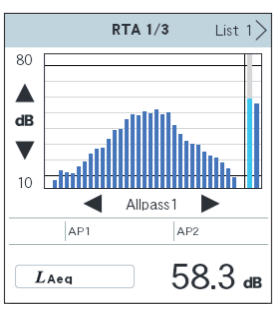Easy sound probing by Bandpass filter!

RTA 1/1   List
80
dB
10
Allpass1
AP2
L_{Aeq} 60.0 dB

Trend   Filter 1/1
80   MAIN BP
dB L_{AF}
10   48.9 dB
2000 Hz
SUB1 AP
L_{AF} 63.8 dB

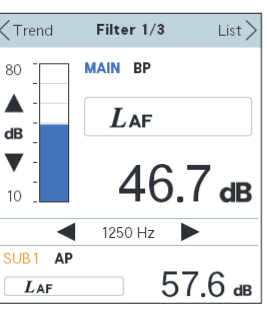## Optional function | 1/3 Real-time Octave Analysis Function LA-0702

Analysis band: 12.5 Hz to 20 kHz (33 bands), Allpass 1, 2
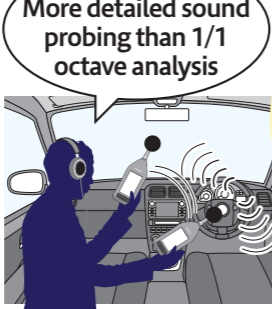Applicable standard, Measurement item, Measurement range, Memory mode: same as 1/1 octave mode

More detailed sound probing than 1/1 octave analysis

Sound Analyzer & Source Identification

RTA 1/3   List 1
80
dB
10
Allpass1
AP1   AP2
L_{Aeq} 58.3 dB

Trend   Filter 1/3   List
80   MAIN BP
dB L_{AF}
10   46.7 dB
1250 Hz
SUB1 AP
L_{AF} 57.6 dB

ONO SOKKI
SOUND LEVEL METER LA-7000

Trend   SLM 2   List
120   MAIN   OVER
dB L_{AF}
50   114.0 dB
SUB1   OVER
L_{AF} 114.0 dB
M 000:10:00   DUAL-MANU-
T 002:30:15   A0022

CAL RECALL

Useful Function

Screen Capture Function
・Captures the displayed screen by pressing Power key and Home key simultaneously.

Key Lock Function
・Press and hold the Home key.

Optional function | Sound Recording Function LA-0704

Easier to record!

Sound Recording

Memory mode: Record
Sampling frequency: 64 kHz
Recording time: approx. 8 hours at 4 GB max. (16-bit)
(Depending on BIT) approx. 5.5 hours at 4 GB max. (24-bit)
File format: wav. (acoustic data)
csv. (playback trend data: Lz in 1s interval)

*Simultaneous processing of analysis and recording in RTA or FFT mode is enabled.
*Please record the data at 2 GB when it will be read by the OS-2000 series. The OS-2000 series can read up to 2 GB of data. (recording time: about half of that when recording with 4 GB)

Optional function | FFT Analysis Function LA-0703

This function can perform analysis with finer line resolution (narrow band analysis). Effective for frequency analysis of single-shot sound using trigger function.

Sound FFT Analyzer

Frequency range: 1 k, 2.5 k, 5 k, 12.5 k, 25 kHz
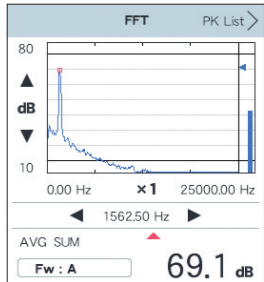Number of lines: 400 (1024), 800 (2048),1600 (4096) (number of sampling points)
Trigger: ON/OFF times (1 to 16), Level (40.0 to 130 dB), Position (-64 points fixed)
Average mode: SUM, MAXhold, EXP (exponential)
Measurement range: Normal range (wide range: not supported)
Applicable memory: Manual, Auto, Logging, Record
Screen expand display (Expand): x1, x2, x4

FFT   PK List
80
10
0.00 Hz   ×1 25000.00 Hz
1562.50 Hz
AVG SUM
Fw : A   69.1 dB

Optional function | Level Judgment Function LA-0705

Judging item: Lp instantaneous value in Main (Calculated value: not supported)
Setting level: 30.0 dB to 130.0 dB
DELAY setting: OFF, 10 ms, 100 ms, 1 s, 2 s, 3 s, 5 s, 10 s
HOLD setting: 100 ms, 200 ms, 500 ms, 1 s, 5 s, 10 s, 30 s, Manual
Output mode: OFF, ON (Mode1LOW), ON (Mode2HI-z)
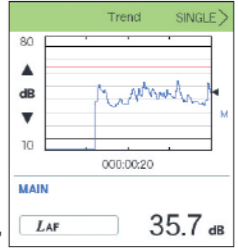
*Output cable (Multi-BNC connector) 2m: provided as standard

Sound Level Judgment

Not over the setting value (green)
*OFF setting: gray

Over the setting value (red)

Trend   SINGLE
80
dB
10
000:00:20
MAIN
L_{AF} 35.7 dB

Trend   SINGLE
80
dB
10
000:00:20
MAIN
L_{AF} 63.0 dB

Optional function | Loudness Calculation Function LA-0708

Effective for sound evaluation that does not give numerical difference in the result of A-weighting.

Sound Quality Evaluation (Stationary Loudness)

・Loudness Calculation function for stationary loudness (conforms to DIN45631)
・Calculation list (diffuse sound field・free sound field)
Loudness value
Loudness level
・Simultaneous measurement
One item from calculation list value, three items from SLM values (LAeq etc.)
Measurement range: Normal range (Wide range: not supported)
Bar graph: Lz value (dB display)

*Contents : Equivalent to the LA-3000 series (previous model)
*Not supported for LA-7200 (Class2)

Loudness   List
100   MAIN
dB N_{GD}
30   47.8 sone
SUB1 L_{Aeq} 79.4 dB
SUB2 L_{Aleq} 80.9 dB
SUB3 L_{Cpeak} 95.4 dB

Accessories & Related products

●Windscreen
φ70 mm

○All-weather windscreen
LA-0207A
Screen: φ200 mm
*Extension cable, tripod: sold separately

●Carrying case
Alkaline battery cell x 4
*Sound calibrator: sold separately
●Instruction manual (CD), setup guide (booklet)

○Instruction manual (booklet:sold separately)
・Basic operation (color)
・Technical References (color)
・Interfaces (color)
・Options
* The contents above are same as the instruction manuals (CD) provided as standard.

○Tripod
LA-0203D
Airy L100
made by SLIK corporation
Reduction length : 417 mm
Lowest position : 170 mm
Highest position : 1543 mm
Weight : 980 g

○Headphones
(Recommended product)
● MDR-7506 : made by Sony Corporation
● ATH-M50, ATH-M30x : made by Audio-technica Corporation

●AC adapter (with 100 VAC concent cable)
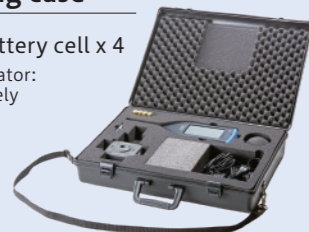**PB-7090**
* Worldwide type cable: Consult your nearest distributor or Ono Sokki sales office nearby.

○Sound calibrator
SC-2500
IEC 60942 Class1, JIS C1515 Class 1
Sound pressure level 114 dB Frequency 1000 Hz

SC-3120
IEC 60942 Class1/C, JIS C1515 Class 1/C
Sound pressure level 114 dB Frequency 250 Hz

SC-2120A
IEC 60942 Class2, JIS C1515 Class 2
Sound pressure level 94 dB Frequency 1000 Hz

○Microphone extension cable
AG-3400 series

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

*MI-0301 Microphone holder is provided as standard.
*Please use the extension correction mode when using extension cable.

○Offline Analysis Software
●**OS-2000 series**
Sound simulator (IIR filter), Sound quality evaluation, Frequency analysis, Trend graph

●**DS-3000 series**
Frequency analysis (FFT analysis, 1/N analysis)

*Please contact your nearest distributor or Ono Sokki sales office nearby for more details.
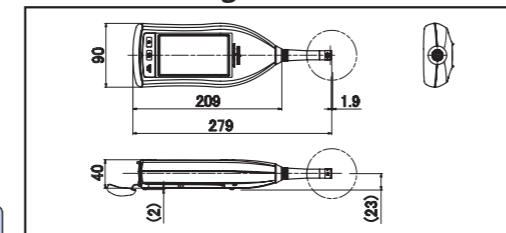
○USB cable
(Recommended product)
●U2C-AMBF2U12BK (1.2 m)
with ferrite core, 2A output supported (made by ELECOM.CO.,LTD)

○Multi-interface
MULTI I/O cable 2m (PS-D10758)
PC side (serial port) : D-sub 9-pin connector

Outline drawing (unit: mm)
209
279
90
1.9
40
(2)
(23)

●SD card
4 GB
*Standard accessory

○SD card
Up to 32 GB
*Recommended product: See our website

●Analog signal cable 2 m
AX-501

●Provided as standard
○Option

Specification

		LA-7500 (Class1)	LA-7200 (Class2)
Applicable standard		IEC 61672-1:2013 Class1	IEC 61672-1:2013 Class2
		JIS C 1509-1:2017 Class1 / JIS C 1516: 2014 Class1	JIS C 1509-1:2017 Class2 / JIS C 1516: 2014 Class2
		ANSI S1.4-2014/ Part1 Class1	ANSI S1.4-2014/ Part1 Class2
Measurement frequency range		10 Hz to 20 kHz	10 Hz to 8 kHz
Measurement level range (IEC, JIS)		A: 24 to 138 dB C: 32 to 138 dB Z: 38 to 138 dB	A: 23 to 138 dB C: 30 to 138 dB Z: 36 to 138 dB
Inherent noise level		A: 16 dB or less C: 24 dB or less Z: 30 dB or less	A: 17 dB or less C: 24 dB or less Z: 30 dB or less
Microphone		MI-1271	MI-1471
Microphone preamplifier		MI-3270	
Linearity range		Wide range: 110 dB/ Normal range: 80 dB	
Level range		20 to 130 dB (wide)/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 (e.g.: L_{AE})		F (fast), S (slow), I (impulse) and 10 ms	
Frequency weighting (e.g.: L_{AF})		A, C and Z	
Measurement items		L_p, L_{eq}, L_E, L_{max}, L_{min}, L_{peak}, L_N (L_5, L_{10}, L_{50}, L_{90}, L_{95}, L_{high}, L_{low}, L_{ave}. and two more of any L_N value)	
Sampling interval		15.6 μs (L_p, L_{eq}, L_E, L_{max}, L_{min}, L_{peak}),100 ms (L_N)	
Measurement time		e.g.: If you want to measure a fixed 10-minute period every hour, and wish to measure this for 24 hours, M.T. shall be 10 min, P.T. shall be 1 h, and T.T. shall be 24 h.	
	Measurement time (Meas.Time)	OFF (free), user-specified setup: 0.1 to 199 hour 59 min. 59.9 sec. resolution: 0.1 sec.	
	Period time (Period Time)	1 min. to 24 hours resolution: 1 min.	
	Total time (Total Time)	0.1 sec. to 999 hour 59 min. 59.9 sec. resolution: 0.1 sec.	
Start mode		Manual start, timer start, count down start, level start	
Display function	Display device	4.3-inch LCD with color backlight (touch panel type)	
	Digital display	4-digit/ resolution: 0.1 dB/ update cycle: 1 s	
	Bar indicator	Wide range: 100 dB of display range/ Normal range: 70 dB of display range	
	Remaining battery level display	4-step display	
Operation mode	Standard	SLM-Single, Dual, Quad, Octave-Filter 1/1, RTA 1/1	
	Option	1/3 octave-Filter 1/3, RTA 1/3, FFT, Loudness (Stationary sound DIN45631)	
Memory function	Memory function	Stored in an SD/SDHC card (SDHC card: up to 32 GB is available.)	
	Memory mode	MANUAL (CSV file), AUTO (instantaneous value, calculated value, CSV file) ·········standard function LOGGING (instantaneous value 10 ms or 100 ms, CSV file) ···························standard function RECORD (WAVE file: 64 kHz sampling) ·································LA-0704 required	
	Panel condition memory	Internal memory of Panel Condition (Internal condition: 5, EZ condition: 5, power off memory), external memory (SDHC card memory)	
	Basic measurement mode	5 modes (EZ1: LAeq+LCpeak, EZ2: Record, EZ3: Logging 100 ms, EZ4: NC, EZ5: Loudness)	
	Clock function	Built-in (Year/ month/ day/ hour/ minute), Continuous operation time: approx. 1 year (charging time: 24 hours from entire discharge state)	
	Calibration history function	Built-in memory (number of stored points: approx. 100 points), content (calibration value, VR position for control, used sound calibrator or internal reference signal, calibration date)	
	Resume function	Stores measurement conditions into the built-in memory	
Calibration	Reference signal (when connecting external device)	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, SC-2500	SC-3120, SC-2500, SC-2120A
Output/Input	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 octave filter (standard function) or 1/3 octave filter mode (option: LA-0702) is used. Maximum output: 0.03 mW (63Ω: at 1kHz), connector: stereo φ3.5	
	AC output	Outputs one of A, C, or Z interlocked with the main display	
	AC output level	Output level: 0.707 Vrms ±5 % (normal range), 2.236 Vrms ±5 % (wide range), range full scale input, when 1 MΩ load, distortion factor (range full scale) 0.2 % or less, load resistance 10 kΩ or more, offset voltage ±30 mV or less, output impedance 50 Ω±2 %	
	AC/DC output	Selectable from DC, AC-Z or Through	
	DC output level	2.5 V ±20 mV (normal range, wide range), range full scale input, when 1 MΩ load, scale factor 0.25 V±10 mV /10 dB, load resistance 10 kΩ or more, output impedance 50 Ω±2 %	
	AC-Z output level	Output level: 0.707 Vrms±5 % (normal range), 2.236 Vrms±5 % (wide range), range full scale input, when 1 MΩ load, distortion factor (range full scale) 0.2 % or less, load resistance 10 kΩ or more, offset voltage ±30 mV or less, output impedance 50 Ω±2 %	
	Through output level	0.707 Vrms ±5 % (normal range, wide range), range full scale input, when 1 MΩ load, distortion factor 0.2 % or less output	
	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	
	Level judgment output (LA-0705) Multi I/O terminal	Open collector (output withstand voltage: DC+24 V or less, sink current: 20 mA or less) (Output cable (Multi I/O-BNC connector 2m): provided as standard) Judgment item: SLM mode (Main: Lp), Filter 1/1, 1/3 (Main (BP): Lp), RTA 1/1, 1/3 (AP1: Lp) FFT (OVERALL): Instant)	
Interface	RS-232C	Baud rate: 9600, 115200 bps, Multi I/O cable (sold separately)	
	USB	Ver. 2.0: Compliant with USB high speed storage class specification, USB connection cable: USB (A) male-micro USB male (sold separately)Function: Command control or mass storage	
	External memory	SD/SDHC memory card (up to 32 GB is available)	
Microphone extension *1		103 m (CE marking compliant: up to 30 m)···AG-3400 series	
Power supply		・Size AA battery (alkaline battery cell or Ni-MH secondary battery) x 4 pieces ・USB bus power (operating input voltage range: 4.75 to 5.25 VDC) ・AC adapter (PB-7090, power consumption: approx. 7 VA when using 100 VAC)	
Interlocking on/off function with an external power supply		The main unit is activated automatically when the power is supplied from an AC adapter. (This function is not available by battery cells.) Switch on/off can be done with the switch in the battery box (standard function).	
Windscreen correction function		Function to correct the influence of windscreen *Applicable to the IEC61672-1 even if the windscreen is installed.	
Battery life (continuous use) *2		Alkaline battery cell LR6: approx. 12 hours, Ni-MH secondary battery: approx. 12 hours	
Operating (storage) temperature range		-10 to 50 °C (-20 to 60 °C)	
Operating (storage) humidity range		20 % to 90 %RH (10 % to 90 %RH) with no condensation	
Outer dimensions		Approx. 90(W)×279(H)×42(D)mm	
Weight		Approx. 540 g (including batteries)	
Accessories		AC adapter (PB-7090), signal cable (AX-501), windscreen (φ70 mm), short lanyard, size AA battery cell x 4 pieces, carrying case (including shoulder belt), SDHC memory card, instruction manual (CD), setup guide	

Please use a recommended SD card when you use the SD memory 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.