



Noise Dosimeter NB-14

Instruction Manual

Hardware Guide



Organization of the NB-14 Instruction Manual

There are four types of instruction manuals for Noise Dosimeter NB-14.

Quick Start Guide

This manual describes the basic handling of Noise Dosimeter NB-14.

Hardware Guide (This Document)

This manual describes the detailed instructions for handling Noise Dosimeter NB-14.

Software Guide

This manual describes the instructions for handling Noise Dosimeter Data Management Software AS-05 Viewer.

Technical Guide

This manual is a technical guide to noise dosimeters and noise dosimetry, including the noise dosimeter performance, microphone structure and characteristics, and how the dedicated windscreens affect measurements.

You can download the instruction manuals from our “Occupational safety and health measures related to noise” web page.



<https://osh.rion.co.jp/nb-14/qrcode-manual>

Safety Precautions / Precautions for Use




Safety precautions

The precautions shown here are intended to help you use the product safely and correctly, and to prevent harm and damage to you and other people. Incidents that could occur as a result of incorrect handling are divided into two categories: "WARNING" and "CAUTION". Make sure to follow the directions of all these categories because they are serious matters related to safety.

Examples of pictorial indications

Specific prohibitions may be displayed in the illustrations.

	Prohibitions		Instructions
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Display	Meaning
 WARNING	Indicates a possibility of death or serious injury due to incorrect handling.
 CAUTION	Indicates a possibility of personal injury or property damage due to incorrect handling.
Important	Failure to observe the precautions indicated by this may result in damage to the device.
 Note	Denotes special information that is helpful in utilizing the capabilities of the device but that is not directly related to safety.

• Handling of rechargeable battery

WARNING



If electrolyte leaking from the battery gets into your eyes, rinse with water without rubbing and immediately seek medical attention.

Failing to do so may result in blindness.

If electrolyte leaking from the battery gets on your skin or clothes, wash it off immediately with water.

• Handling of this product

WARNING



Do Not Disassemble

Never disassemble, repair, or modify the product.

Doing so may cause a fire, electric shock, or an accident.



No Wet Hands

Do not connect the dedicated USB cable or remove the main unit with wet hands.

Doing so may cause electric shock or injury.



Keep Dry

Do not immerse the main unit in water or splash water on it.

The microphone part is not waterproof. Immersing it in water or splashing it with water may cause electric shock or malfunction.



Do not use the device for purposes other than for what it is originally intended.

Keep the product away from heat sources such as fire and stoves.

Failure to do so may cause a fire, electric shock, or malfunction.

Do not use the device if any abnormality such as damage is discovered.

Continuing to use the device regardless of an abnormality may cause electric shock or fire. In such circumstances, please contact your dealer.

Do not use the device if there is something wrong with it, such as it becoming abnormally hot.

Doing so may result in a malfunction or fire.

Do not use or charge the battery in a humid place such as a bathroom or in a place where it may get wet.

Doing so may cause electric shock or malfunction.

Do not use, store, or leave the product in a hot place such as in a place exposed to fire, direct sunlight, or inside a car on a hot day.

Doing so may cause fire, battery breakage, or overheating.

When disposing of the product, do not throw it into fire.

Doing so may cause a fire or the battery to explode. When disposing of the product, follow the regulations of your country or local municipality.



If there is dust on the charging terminal, wipe it off before connecting the dedicated USB cable.

Failure to do so may result in electric shock, short circuit, or fire.

Wipe off any water on the main unit and the charging terminal before charging.

Failure to do so may result in electric shock, short circuit, or fire.

CAUTION



Do not use or store the product within the reach of children or pets.

Doing so may result in electric shock, injury, or accidental ingestion.

Do not place the device in your pocket and sit with your legs under an electric blanket or near a heat source, etc.

Doing so may result in the rechargeable lithium-ion battery overheating and causing low-temperature burns.



Stop charging immediately if the LED on the dedicated USB cable flashes.

In such circumstances, please contact your dealer.

Do not pinch your hands or skin with the crocodile clip.

Place the dedicated USB cable on a horizontal surface.

Using it in a suspended position, such as hanging it on a hook, may cause disconnection of the cable.

Precautions for use

- Avoid using and storing the product in places with high temperatures and humidity, or in places exposed to direct sunlight for long periods of time.
- If there is a drastic change in the surrounding temperature, the product may malfunction due to internal condensation.
- As the main unit is a precision electronic device, avoid using or storing it in locations subject to shock or vibration.
- Do not sit down with the product in your pocket, etc. Doing so may result in excessive force being applied and cause a malfunction.
- Do not insert wires, metal pieces, conductive plastics, etc. through any holes or gaps of the product. Doing so may result in a malfunction.
- Do not replace the microphone with those with manufacturing numbers different from those specified on the nameplate.
- If you are using the device outdoors and it starts raining, stop taking measurements and keep the device dry. If the device gets wet, wipe it off with a dry cloth and dry it in a well-ventilated environment.
- Make sure that the microphone is installed securely before conducting sound calibration. If there is any looseness, turn off the power and retighten the microphone.
- To maintain the accuracy of measurements, inspect the device regularly.
- During the inspection of the NB-14, there is a possibility that the measurement and calibration data stored within the device may be deleted. Before requesting an inspection, ensure to back up your measurement and calibration data.

[USB driver of the connected computer]

- If a specific USB driver (such as Red Hat's USBDK.sys) is installed on the computer to which the product is to be connected, and the USB device's hidden setting is applied on the driver, the USB drive may not be displayed even if the product is connected. If this happens, uninstall the specific driver or change the hidden setting.

[Built-in battery]

- If you will not be using the product for a long time, do not fully charge it, disconnect the dedicated USB cable, and store it in a cool, dark place.
- To prevent over-discharging, charge the device regularly (every 2-3 months).
- Battery life (duration the NB-14 operates on the battery) may vary depending on factors such as temperature, battery usage history, and battery storage conditions.
- Batteries are consumables. Repeated charging and discharging will reduce battery capacity and shorten battery life. If the operating time becomes shorter, please contact your dealer.
- The time information may be set back to its factory settings if the product is left with the built-in battery used up. If the built-in battery is used up, charge it as soon as possible.
- Do not charge the device by any method other than the specified charging method.

[Disclaimer]

- RION shall not be held accountable for the following damages.
Any damage caused by earthquakes, lightning, wind and floods, fires for which RION is not responsible, actions or accidents by a third party, intentional or negligent misuse by the customer, or use under other abnormal conditions
- RION shall not be held accountable for the following incidental damages arising from the use or inability to use this product.
Alteration or loss of recorded content, loss of business profits, or the interruption of business, etc.
- RION shall not be held accountable for any damage caused by not following the directions of this document.

[Cleaning the product]

- Wipe the product dry with a soft cloth. If the dirt is difficult to remove, use a diluted neutral detergent.
- Do not use organic solvents such as alcohol or thinner for cleaning.
Doing so may cause deterioration such as cracking of the main unit.

[Disposing of the product]

- This product uses a lithium-ion rechargeable battery.
When disposing of the product, follow the regulations of your country or local municipality.

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1

Overview of This Product

This product is a device that measures the amount of noise workers are exposed to in noisy environments. It not only complies with the international standard IEC 61252:1993+AMD1:2000+AMD2:2017 for Noise Dosimeters, but also with the international standard IEC 61672-1:2013 class 2 for sound level meters and the Japanese standard JIS C 1509-1:2017 class 2 for sound level meters, allowing easy and accurate measurement of personal noise exposure. In addition, it is possible to measure individual noise exposure based on the guidelines for noise disturbance prevention (established by the Ministry of Health, Labor and Welfare of Japan).

Data can be viewed and exported using the dedicated management software AS-05 Viewer.

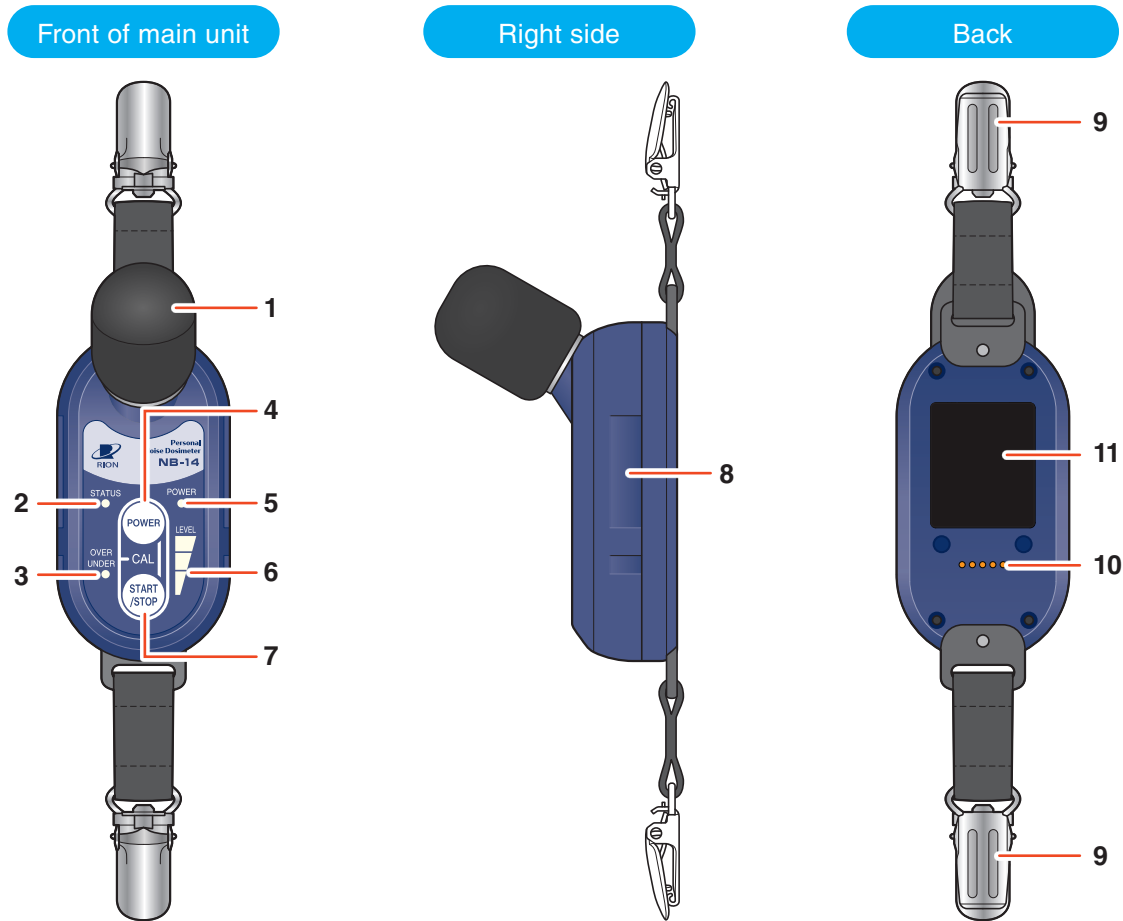
In addition, the built-in accelerometer can measure the noise exposure level as well as detect the physical impact applied to this device.

As the device can distinguish whether the measured value is noise or due to a physical impact other than noise, it provides highly reliable measurements.

Furthermore, it has a built-in lithium-ion rechargeable battery, which supports long-term use by workers during three-shift work (8 hours) or two-shift work (12 hours).

2

Name of Each Part



No.	Name/Description	
1	Dedicated windscreen / microphone	
2	STATUS LED When the power is on, the LED will light up or turn off as follows.	
	Lit green	Storage capacity is available for the set storage time (Default value: 8 hours) or longer.
	Lit red	Storage capacity is less than the set storage time (Default value: 8 hours).
	Lit blue	Calibrating
	Flashes orange	Measuring
	Flashes red	Measuring (with OVER history)
	Off	Writing measurement data

No.	Name/Description
3	OVER/UNDER LED OVER/UNDER for Equivalent continuous A-weighted sound level is displayed.
	Lit red The measurement level is higher than the upper limit (143 dB) of the measurement level range (OVER).
	Lit green The measurement level is lower than the lower limit (58 dB) of the measurement level range (UNDER).
4	POWER key Press to turn on the power. When the power is on, press and hold to turn off the power.
5	POWER LED Lights on when the power is turned on.
	Lit green The battery capacity is 8 hours or more.
	Lit orange The battery capacity is less than 8 hours.
	Lit red The battery capacity is less than 4 hours.
	Flashes red The battery capacity is insufficient. Measurement stops.
6	LEVEL LED Percentage of the legal limit of a physical quantity of exposure (DOSE (%)) is displayed with a bar graph. The initial values are set as below.
	Unlit Less than 50%
	One LED lit green 50% or more and less than 100%
	Two LEDs lit orange 100% or more and less than 200%
	Three LEDs lit red 200% or more and less than 400%
	Three LEDs flash red 400% or more
7	START/STOP key Press and hold to start measuring. Press and hold while measuring to end taking measurements.
8	Space for label printer sticker (both sides on the main unit) Label printer stickers up to 6 mm wide x 25 mm long can be affixed here.
9	Crocodile clip Secures the device in place by clipping it onto work clothes, etc.
10	Charger / USB terminal Used to connect a charger, computer, etc. using the dedicated USB cable.
11	Nameplate It shows necessary information such as the model, date of manufacture, and applicable standards of the device.

No.	Name / Description
4 + 7	Calibration Press and hold the POWER key and START/STOP key at the same time to enter calibration mode. If you press and hold down the POWER key and the START/STOP key again, it will execute the calibration. Press and hold the POWER key and START/STOP key again to execute the calibration. Calibration ends automatically. If you want to cancel the calibration, press and hold the POWER key.

3

Charging Method

When using this product for the first time, fully charge the battery before use.

1 Connect the device to the dedicated USB cable.

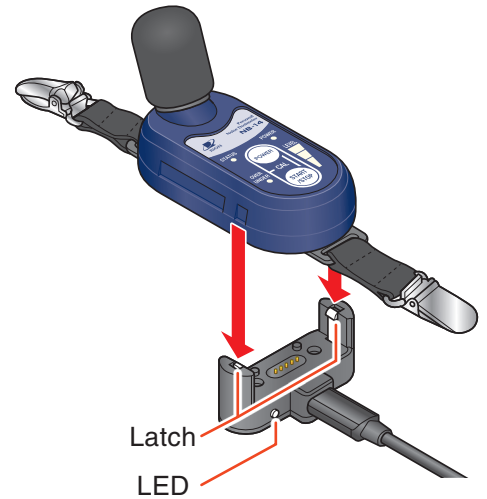
Connect the unit by hooking it onto the latch.

2 Connect the USB Type-A connector of the dedicated USB cable to a charger, etc.

The LED on the dedicated USB cable lights blue while charging.

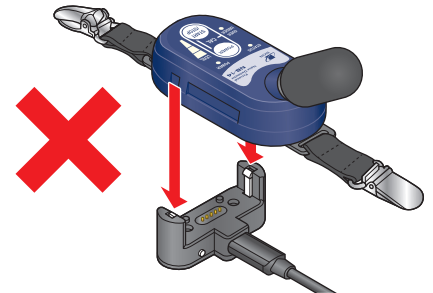
The LED turns off when the device is fully charged.

- The device can be used for 12 hours or more when fully charged.
- The device takes about 6 hours to be fully charged from zero battery capacity.



⚠ CAUTION

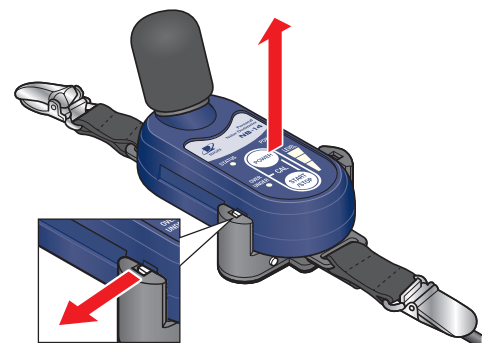
- When connecting the device to the dedicated USB cable, pay attention to its direction. Do not connect the device in the direction shown in the figure to the right. Make sure the microphone faces away from the dedicated USB cable.



- Charge the device in an environment between 5°C and 35°C. Charging outside this temperature range may cause charging to stop or damage the battery.

3 When charging is complete, disconnect the device from the dedicated USB cable.

Expand the latch of the dedicated USB cable outward before removing it.



4

Measuring Method

1 Use the crocodile clip to attach the main unit to work clothes, etc.

Make sure that the microphone faces upwards.

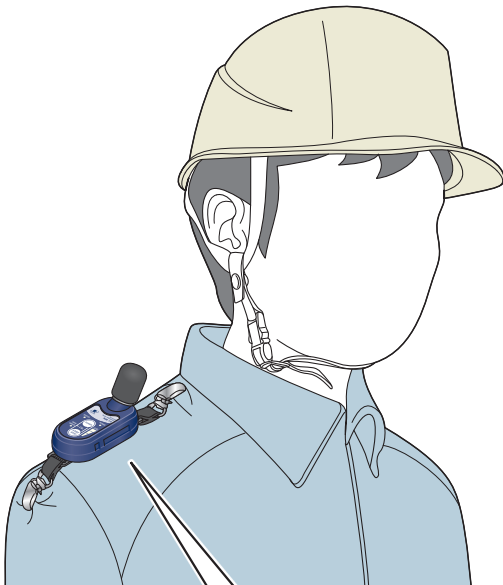
⚠ CAUTION

- Be careful not to get injured by pinching your hand or skin with the crocodile clip when attaching the device.

Important

- Attach it securely so that it will not fall off easily.
- Attach the microphone of this device so that it is positioned within 1 foot of the worker's ear.
- The microphone part is not waterproof, so do not use it in an environment where it may get wet.

[When attaching horizontally]

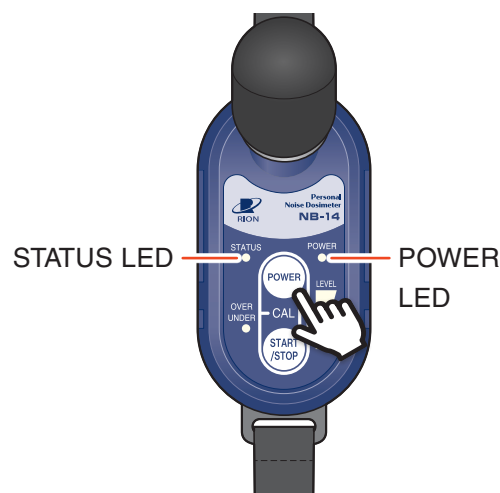


[When attaching vertically]



2 Press the **POWER** key to turn on the device.

The STATUS LED and POWER LED light up.



STATUS LED State

State		Display
Idle state (With the power on)	No error	Lit green STATUS ●
	The clock is not set or not enough memory is remaining	Lit red STATUS ●
Calibration state		Lit blue STATUS ●
Measuring	Measuring	Flashes orange STATUS ●
	With OVER history	Flashes red STATUS ●
	Writing measurement data	Off STATUS ○

POWER LED State

State	Display
The battery capacity is 8 hours or more	Lit green POWER ●
The battery capacity is less than 8 hours	Lit orange POWER ●
The battery capacity is less than 4 hours	Lit red POWER ●
The battery capacity is insufficient	Flashes red POWER ●

Note

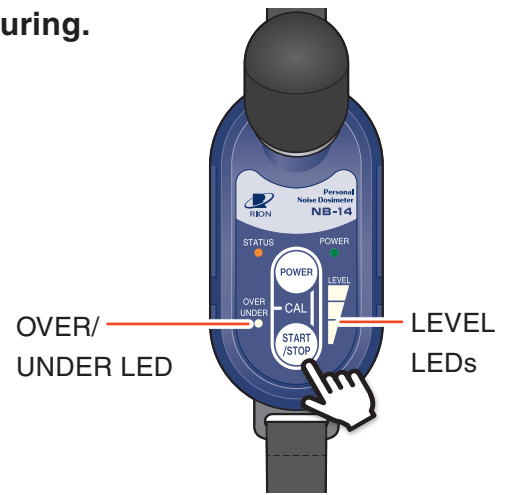
- Make sure that the POWER LED and STATUS LED are lit green before starting measurement.
- Battery capacity may not be displayed correctly, especially at low temperatures. In such a case, fully charge the battery before use.

3 Press and hold the START/STOP key to start measuring.

- The STATUS LED flashes orange while measuring.
- The amount of data that can be stored in one product unit is about 48 hours' worth.
- Press and hold the POWER key while measuring to end taking measurements and turning off the power.

Note

- Pressing and holding the POWER key and the START/STOP key during measurement will not trigger calibration. If these buttons are held pressed, the power will forcibly turn off and the measurement data will be lost. Do not press and hold the POWER key and the START/STOP key during measurement.



- While measuring, the noise exposure level is displayed by the LEVEL LEDs.

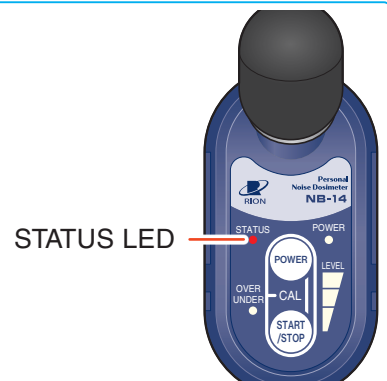
LEVEL LEDs	Unlit	One LED lit green	Two LEDs lit orange	Three LEDs lit red	Three LEDs flash red
Daily exposure / tolerance	(Less than 50%)	(50% or more and less than 100%)	100% or more and less than 200%	200% or more and less than 400%	400% or more

- If an overload condition or under-range condition is detected while measuring, it is indicated by the OVER/UNDER LED.

Input level	Higher than the measurement upper limit	Lower than the measurement lower limit
OVER/UNDER LED	Lit red OVER UNDER 	Lit green OVER UNDER

Note

- If OVER occurs even once during a measurement session, the STATUS LED will flash red instead of orange, and the occurrence of OVER will be displayed as a history.
- The STATUS LED continues to flash red until the measurement session ends.



4 When finished, press and hold the START/STOP key to stop measuring.

Check that the STATUS LED is now lit green.

Important

- It may take about 1 minute for the data to be saved after the measurement is stopped by pressing and holding the START/STOP key. The STATUS LED is off during this time. Do not perform any operation such as turning off the power until it lights up again. The device may not function properly otherwise.



5 Remove the main unit from your work clothes and connect it to the dedicated USB cable.

6 Import the measurement data to your computer.

For how to import measurement data, see the “Noise Dosimeter Data Management Software AS-05 Viewer Instruction Manual.”

7 Press and hold the POWER key to turn off the power.

Important

- Pressing and holding the POWER key and the START/STOP key during measurement will not trigger calibration. If these buttons are held pressed, the power will forcibly turn off, which may result in data loss, abnormal operation of the device, and potential impact on the measurement data during abnormal operation. Do not press and hold the POWER key and the START/STOP key during measurement.



5

Calibration Method

Insert the microphone of the device into the sound calibrator (NC-75/NC-74) to perform sound calibration and automatic adjustment.

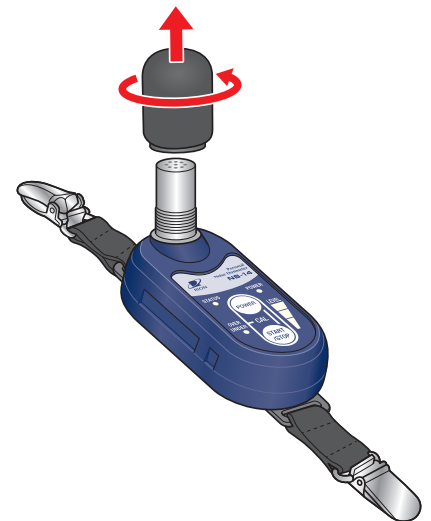
Note

- Make sure to calibrate before and after measurement.
- For details on how to calibrate using a sound calibrator, refer to the instruction manual of the sound calibrator.
- We recommend regularly calibrating the sound calibrator.
- Perform sound calibration with the microphone of this device horizontally inserted all the way into the sound calibrator.
- Calibrate in a state where the background noise is sufficiently low.

1 Make sure the sound calibrator is turned off.

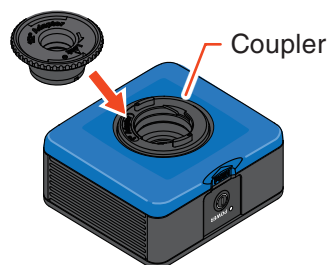
2 Remove the dedicated windscreen from the device.

- Rotate the dedicated windscreen by its base, not by its tip.
- Since the dedicated windscreen has a screw thread, rotate it counterclockwise to remove.



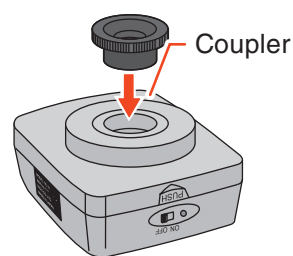
3 Attach the 1/2-inch adapter to the sound calibrator coupler.

1/2-inch adapter
for NC-75



Sound calibrator NC-75

1/2-inch adapter
for NC-74



Sound calibrator NC-74

- 4 Gently and slowly push the microphone of the device until it hits the back of the coupler.**

Important

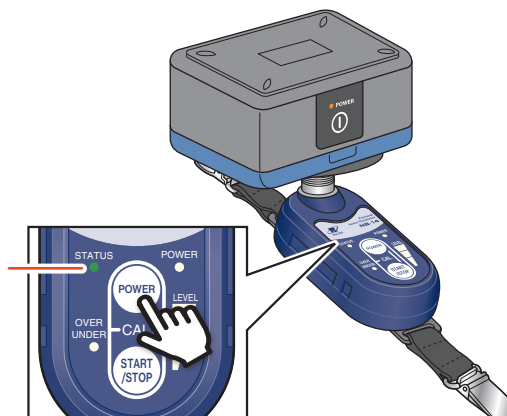
- Insert the sound calibrator gently and slowly into the microphone.
If it is pushed in or pulled out suddenly, the air pressure inside the coupler will change significantly, which may damage the diaphragm of the microphone.
Also, when attaching or detaching the calibrator, do not rotate the device or the calibrator. Doing so may cause the microphone to be detached and fall.

- 5 Turn on the sound calibrator.**

- 6 Press the POWER key of the device to turn on the power.**

The STATUS LED and the POWER LED light up when the power turns on.

The STATUS LED
lights green when
the power turns on.




Note

- Wait at least 30 seconds after turning on the sound calibrator and the device before starting calibration.

7 Press and hold the POWER key and the START/STOP key to start calibration.


[Calibration sound recognition]

Only the center LED lights orange

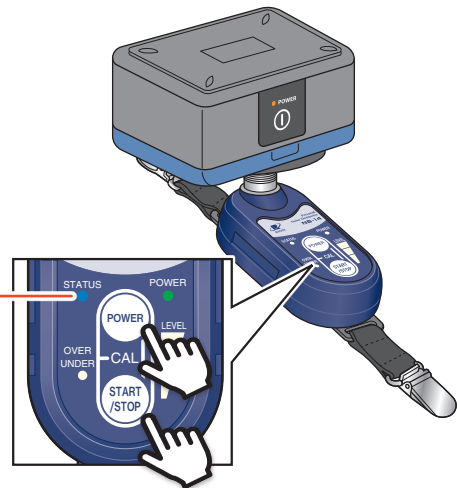


[Calibration ready]

The center LED lights orange
The top and bottom LEDs light green




Once in the calibration state, the STATUS LED will light blue.



[Calibration not possible]

If an error occurs, it will be displayed as follows:

The center LED lights orange
The top and bottom LEDs light red



If an error occurs, press and hold the POWER key to return to normal status, and then perform calibration again.

Note

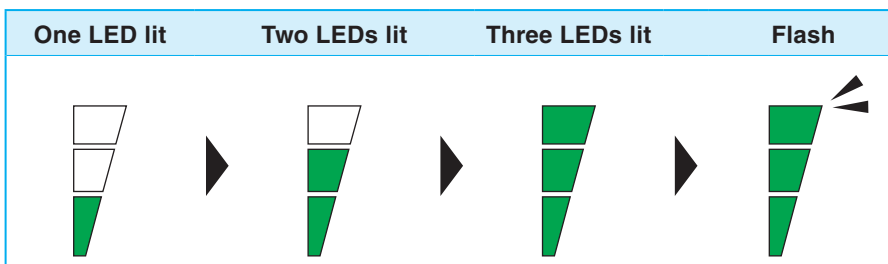
- Pressing and holding the POWER key and the START/STOP key during measurement will not trigger calibration. If these buttons are held pressed, the power will forcibly turn off and the measurement data will be lost. Do not press and hold the POWER key and the START/STOP key during measurement.
- If the error persists even after calibrating again, please contact your dealer.

8 Press and hold the POWER key and the START/STOP key at the same time again to start calibration.

[Executing Calibration]

While calibrating, the LEVEL LED lights up in sequence and the device records the calibration value.

- Automatic adjustment is performed after sound calibration.
- The LEVEL LED flash when calibration and adjustment are finished.

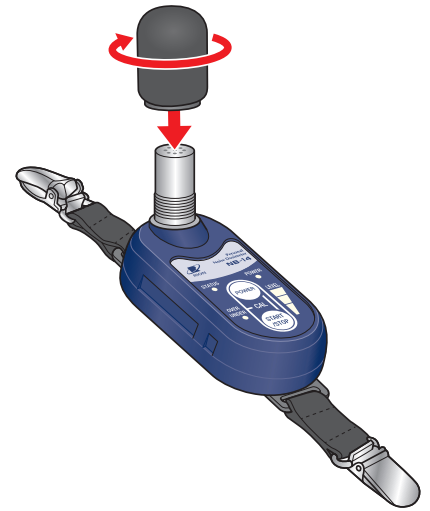


9 Calibration ends automatically.

To calibrate again, press and hold the POWER key and the START/STOP key at the same time again.

10 After calibration ends, turn off the sound calibrator and the device.**11 Gently and slowly pull the microphone out of the coupler.****12 Attach the dedicated windscreen.**

Attach the dedicated windscreen by rotating it clockwise all the way to the end.



6

Specifications

Applicable standards	IEC 61252:1993+AMD1:2000+AMD2:2017 IEC 61672-1:2013 class 2 JIS C 1509-1:2017 class 2 VCCI Class B CE Marking <ul style="list-style-type: none"> • EMC Directive 2014/30/EU • RoHS Directive 2011/65/EU UKCA Marking China RoHS	
Microphone	UC-52	
Measurement function (Measures each calculated value at the same time)	Equivalent continuous A-weighted sound level	L_{Aeq}
	Equivalent continuous C-weighted sound level	L_{Ceq}
	C-weighted peak sound level	L_{Cpeak}
	Percentage of the legal limit of a physical quantity of exposure	DOSE
Measurement level range	Equivalent continuous A-weighted sound level	58 dB to 143 dB
	Equivalent continuous C-weighted sound level	58 dB to 143 dB
	C-weighted peak sound level	75 dB to 146 dB
Noise floor level	A-weighted equivalent continuous sound level	Typical 46 dB
	C-weighted equivalent continuous sound level	
Entire linear operating range (A-weighting, 1 kHz)	58 dB to 143 dB	
Linear operating range	85 dB	
Measurement frequency range	20 Hz to 8 kHz	
Standard frequency	1 kHz	
Reference sound pressure level	94 dB	
Frequency weighting	Digital processing method: A-weighting, C-weighting	
Effective value detection circuit	Digital processing method	
Display	Power supply status, measurement status, overload/under-range bar graph (Percentage of the legal limit of a physical quantity of exposure DOSE)	
Sampling interval	20.8 μ s (sampling frequency 48 kHz)	
Store cycle	1 sec.	
Calibration	Sound calibration and automatic adjustment are performed using the following sound calibrators. <ul style="list-style-type: none"> • NC-75/NC-74 	
	Calibration signal frequency	1 kHz
	Calibration signal level	93.9 dB
Internal memory	Stores approximately 48 hours' worth of measurement data	

USB	Communication	Measurement values can be acquired and settings can be changed by using communication commands
	Data transfer	Enables the transferring of data by making the computer recognize the SD card as a removable disk
Power	<p>Built-in lithium-ion rechargeable battery (secondary battery) A separate charger (commercially available) is required for charging. Voltage and current required for charging: 5 V, 185 mA Continuous operating time: 12 hours or more from a fully charged state (within the operating temperature range) The current values required for charging are as follows (power supply voltage: 5 V): When the power is on: 185 mA (Typical value) When the power is off: 141 mA (Typical value)</p>	
Operating temperature and humidity range	<p>Temperature: -10°C to 50°C Humidity: 10% to 90% RH (no condensation) Charging temperature range: 5°C to 35°C</p>	
Dimensions/weight	85 mm (H) × 43 mm (W) × 22 mm (D) / Approx. 72 g (excluding attachment)	
Dustproof and waterproof performance	IP54 (excluding microphone part)	
Accessories	Dedicated USB cable	×1
	Dedicated windscreen	×1
	Crocodile clip holder (already attached to the device)	×1
	Instruction Manual (Quick Start Guide)	×1
	Precautions when detaching the windscreen	×1
	Document for China RoHS	×1
	Supplied Accessories & Inspection Certificate	×1
Optional accessories	<p>Sound calibrator NC-75 Dedicated USB cable Dedicated windscreen Crocodile clip holder</p>	

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