INSTRUCTION MANUAL

Pistonphone

NC-72B

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https://www.rion.co.jp/english/

Organization of this manual

This manual describes the features and operation of the Pistonphone NC-72B.

This manual contains the following sections.

Outline

Gives basic information on the unit.

NC-72B Main Unit External View

Contains drawings that show the pistonphone from all sides.

Accessories External View

Contains drawings that show the supplied accessories.

Names of Parts and Functions

Identifies and explains all parts of the unit.

Operation

Explains how to insert batteries, how to use the supplied adapters, and how to calibrate a sound pressure measurement system (sound level meter).

Reference

Explains output level differences and compensation according to atmospheric pressure and microphone combinations, and explains the influence of radio frequency fields.

Specifications

Lists the technical specifications of the unit.

* All company names and product names mentioned in this manual are usually trademarks or registered trademarks of their respective owners.

This product can be used in any areas including residential areas.

To conform to the EU requirement of the Directive on Waste Electrical and Electronic Equipment, the symbol mark on the right is shown on the instrument.

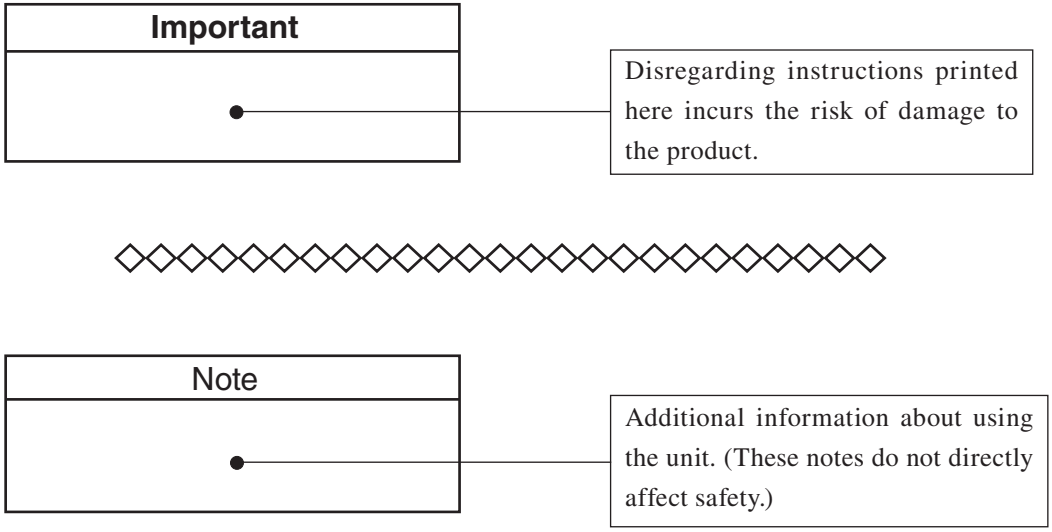
CE

The product described in this manual is in conformity with the following European standards;

EN IEC 60942:2018 EN 61326-1:2013 EN IEC 61000-6-2:2019

FOR SAFETY

In this manual, important safety instructions are specially marked as shown below. To prevent the risk of death or injury to persons and severe damage to the unit or peripheral equipment, make sure that all instructions are fully understood and observed.



Precautions

- Read the documentation carefully, and operate the unit only as described in this manual.
- Do not use or store the unit in locations which may be
  - subject to splashes of water
  - subject to high levels of dust
  - subject to direct sunlight
  - subject to vibrations or shock
  - subject to air with high salt or sulphur content, to gases, or are in the vicinity of any substances that may adversely affect the unit
  - outside of the specified temperature and humidity range
  - subject to drastic temperature changes and to condensation
- Do not use the unit for any purpose other than calibrating sound level meters or microphones.
- Do not hold the coupler to the ear for a long time.
- Be sure to use only the specified batteries.

- To prevent the risk of battery fluid leakage, remove the batteries from the unit when not using it.
- This product does not require lubrication. Do not apply oil or similar to any part of the unit.
- Do not try to disassemble or alter the unit.
- Never insert any foreign object into the coupler.
- In case of malfunction, do not attempt any repairs. Note the condition of the unit clearly and contact the supplier.
- During operation, sound other than the 250 Hz tone may be heard, but this does not affect the performance of the unit.
- The unit is a precision product. Always handle it carefully and do not subject it to shocks.
- Dispose of the unit and of used batteries in accordance with local laws and regulations. The unit does not contain any substances harmful to the environment. Treat the unit as non-combustible waste.
- In order to maintain continued precision, have the unit checked and serviced once per year. Contact the supplier.

- To clean the unit, use only a dry cloth or a cloth lightly moistened with lukewarm water. Do not use solvents or alcohol-based cleaners.
- When mounting and dismounting the microphone of the sound pressure measurement system (sound level meter), do not rotate the microphone or pistonphone. Otherwise the protective grid of the microphone may become loose or detached, causing damage to the microphone diaphragm.
- Be sure to use only the 1/2-inch microphone adapter NC-72-S26 and 1/4-inch microphone adapter NC-72-S27 designed specifically for the unit. Using another adapter may prevent correct calibration.

Contents

FOR SAFETY iii

Outline 1

NC-72B Main Unit External View 2

Accessories External View 3

Names of Parts and Functions 5
- Coupler 5
- Power supply section 6
- Side view 7

Operation 8
- Inserting the batteries 8
- Checking the battery voltage 11
- Sound pressure measurement system (sound level meter) calibration 12
- Using the microphone adapters 16

Reference 17
- Output sound pressure level compensation 17
- Electromagnetic compatibility 28

Specifications 31

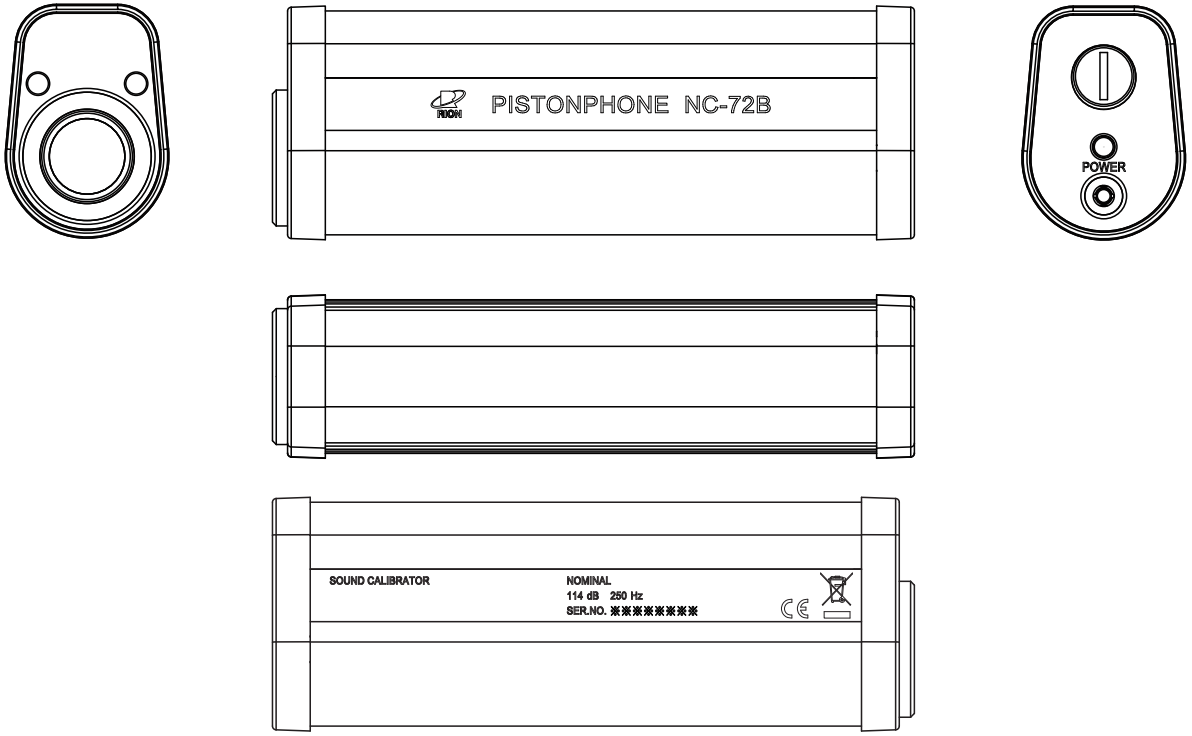
Outline

The pistonphone NC-72B is a sound calibrator that conforms to IEC 60942:2017 class LS/M, class 1/M and JIS C 1515:2020 class LS/M, class 1/M specifications.

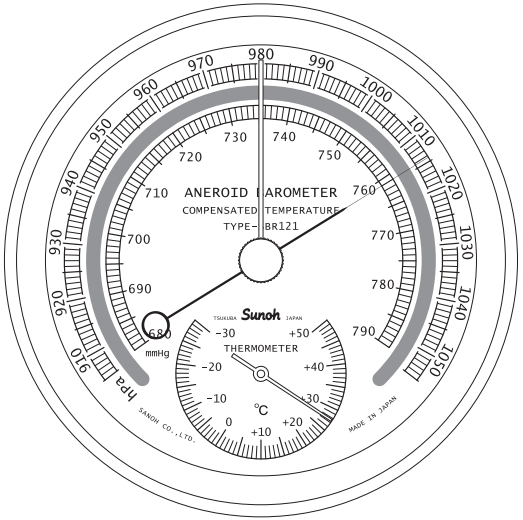
It uses a purely mechanical sound generation mechanism that changes very little over time. Sound is generated with constant sound pressure and frequency regardless of changes in the ambient environment. However, for changes in static pressure (atmospheric pressure) as observed with a barometer, a compensation adjustment in the sound pressure level is required.

The product is highly suitable for the maintenance and management of acoustic measurement systems at research institutions, but can also be used indoors and outdoors as an on-site calibration sound source for acoustic measurements. 1-inch, 1/2-inch, and 1/4-inch microphones are supported.

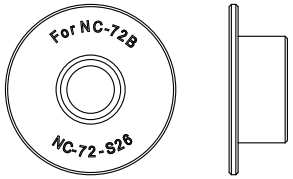
NC-72B Main Unit External View



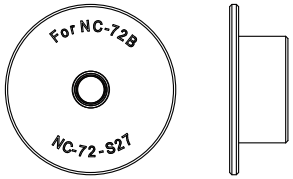
Accessories External View



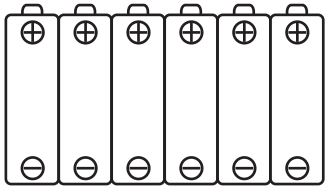
Barometer



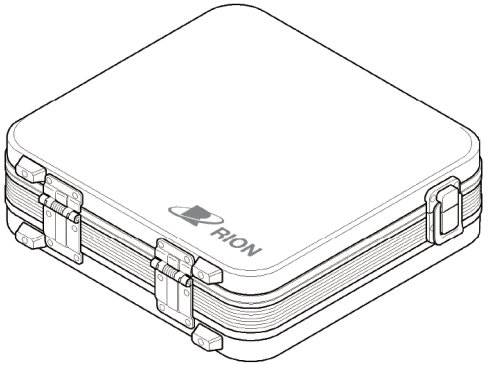
1/2-inch adapter



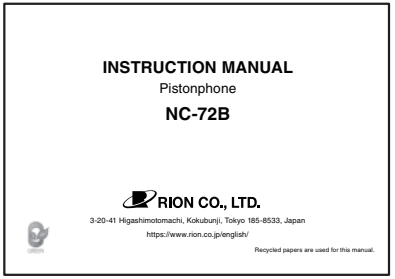
1/4-inch adapter



Alkaline batteries (LR6)



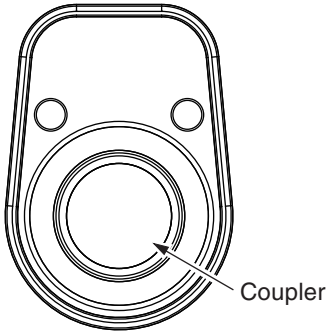
Carrying case



Instruction manual (this document)

Names of Parts and Functions

Coupler



Coupler

Insert the microphone of the sound pressure measurement system (sound level meter) here.

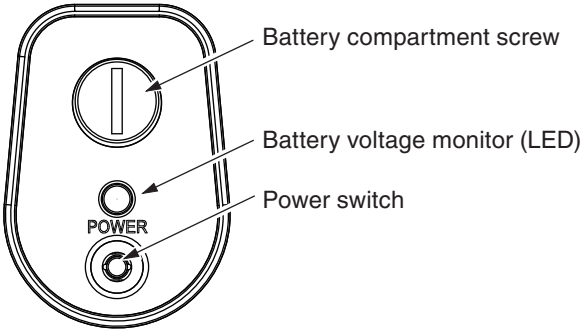
Use the 1/2-inch or 1/4-inch adapter as required by the microphone.

Important

The coupler section also contains the piston part that generates sound pressure. If a foreign object enters the coupler, correct sound pressure and frequency are not assured.

- Never insert finger or any kind of stick into the coupler.
- Protect the coupler from any metallic or other foreign matter and from water, oil, or any other kind of liquid.
- Protect the coupler from dust and other contamination.

Power supply section



Battery compartment screw

Turn this screw to open the cover for battery replacement.

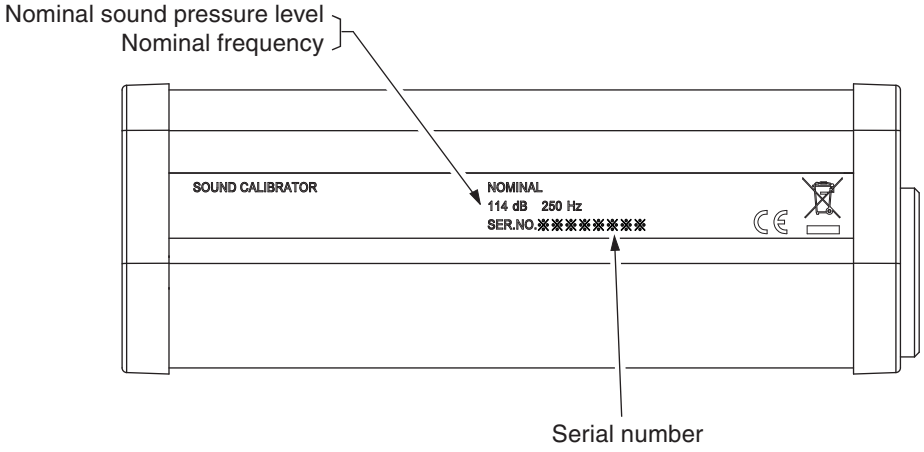
Battery voltage monitor (LED)

Enables to visually check the state of the batteries.

Power switch

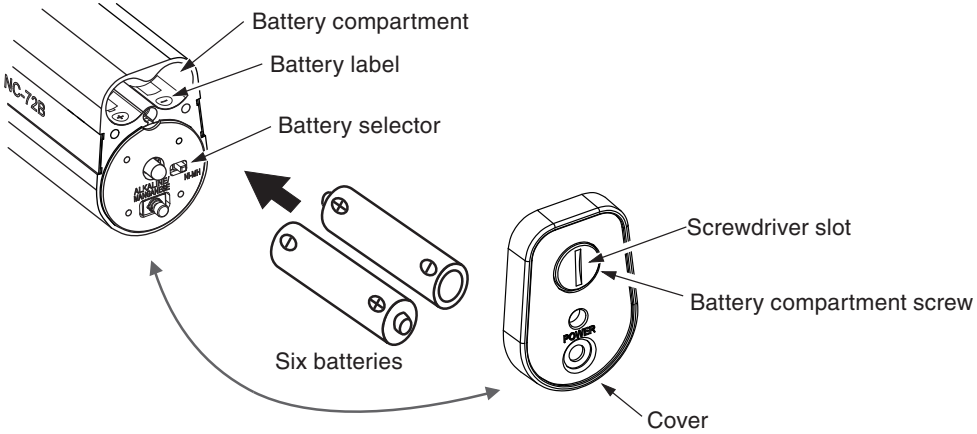
Turns the unit on and off. The key must be held down for at least 1 second to take effect.

Side view


Nominal sound pressure level
Nominal frequency
SOUND CALIBRATOR
NOMINAL
114 dB 250 Hz
SER.NO.※※※※※※※※※
Serial number

Operation

Inserting the batteries

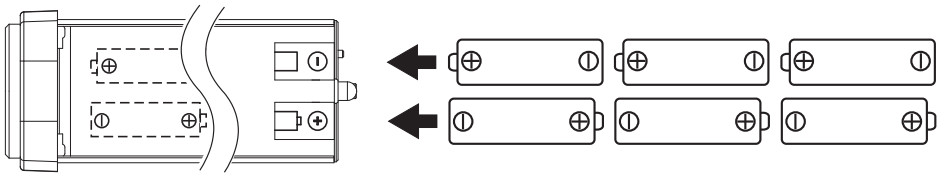


1. Remove the cover from the unit.
   Insert a flat-blade screwdriver into the slot of the battery compartment screw and turn it counterclockwise to remove the cover. Make sure not to turn the screw too much to prevent it from coming off.

2. Set the switch to the correct position, according to the battery type in use. When using alkaline batteries (LR6) or manganese batteries (R6P), select the “ALKALINE/MANGANESE” position. When using nickel-hydride rechargeable batteries (HR6), select the “Ni-MH” position.

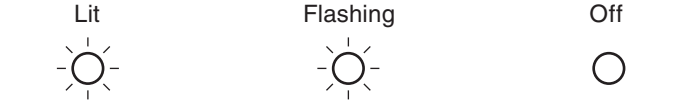
Important
Even if the switch setting does not match the battery used, there is no effect on the calibration result. However, be sure to switch to the correct position to prevent the risk of battery fluid leakage that can cause corrosion and damage.

3. Insert six fresh batteries into the battery compartment, with correct +, – orientation as shown below. The label in the battery compartment also indicates the polarity.
4. Press the cover against the unit and turn the battery compartment screw clockwise with the flat-blade screwdriver until the screw is tight.



Important
- To avoid dropping the batteries, perform battery replacement at a suitable and safe location. - Make sure to insert batteries with correct +, – orientation as shown above. (The label in the battery compartment also indicates the polarity.) - A total of six batteries are required. - Do not mix old and new batteries. - Do not mix different battery types. - To prevent the risk of battery fluid leakage that can cause corrosion and damage, be sure to remove the batteries from the unit when not using it. - Dispose of used batteries in accordance with local laws and regulations.

Checking the battery voltage



When turning power to the unit on, use the battery voltage monitor (LED) to check the state of the batteries.

If the battery voltage monitor (LED) is off, the batteries must be replaced. If the battery voltage monitor (LED) is flashing, the batteries will have to be replaced soon. For information of how to replace the batteries, see pages 8 to 10.

The expected battery life when using the unit at room temperature (approx. 23°C) is at least 15 hours with alkaline batteries (LR6), at least 4 hours with manganese batteries (R6P), and at least 13 hours with nickel-hydride rechargeable batteries (HR6).

Note
When near the lower temperature limit (–10°C) of ambient conditions for operation, it is recommended to use alkaline batteries (LR6) or nickel-hydride rechargeable batteries (HR6). This is because manganese batteries (R6P) generally have a significantly reduced battery life at low temperatures compared with other batteries.

Sound pressure measurement system (sound level meter) calibration

1. Make sure that power to the pistonphone is turned off.
2. Set the frequency weighting of the sound pressure measurement system (sound level meter) to “Z” or “C”.
3. Select the measurement range of the sound pressure measurement system (sound level meter) so that 114 dB can be measured.
4. Carefully insert the microphone of the sound pressure measurement system (sound level meter) fully into the coupler of the pistonphone.

Important
When inserting the microphone into the pistonphone, always proceed very slowly and carefully, to avoid the possibility of damage to the microphone diaphragm caused by abrupt changes in air pressure. Also, do not rotate the microphone or the pistonphone while inserting. Otherwise the protective grid of the microphone may become loose or detached, causing damage to the microphone diaphragm.

Note
Provided that the microphone inserted into the coupler of the pistonphone is seated firmly without play, the pistonphone may basically face any direction during use. The recommended calibration procedure is as follows. Position the pistonphone and microphone horizontally and insert the microphone. Adjust the position so that the coupler and the microphone are at the same height, and make sure that there is no play. Then perform calibration.

5. After inserting the microphone into the pistonphone, wait at least 1 minute.

Note
If calibration is performed immediately after inserting the microphone, correct results cannot be achieved due to the change in air pressure. You must wait about 1 minute until the pressure inside the microphone stabilizes. The exact amount of required time varies depending on the microphone. Refer to the documentation of the microphone or the sound pressure measurement system (sound level meter) for more information.

6. When the indication of the sound pressure measurement system (sound level meter) has stabilized, read the indicated value.

7. Turn the power to the pistonphone on.
   Wait until the indication of the sound pressure measurement system (sound level meter) has stabilized. Then read the indicated value. Verify that the value is at least 30 dB higher than the value obtained in step 6.

Important
If the difference in readings is less than 30 dB, correct calibration will not be possible, due to the influence of background noise.

8. Adjust the sound pressure measurement system (sound level meter) so that it reads 114 dB*.
   * The output sound pressure level generated by the pistonphone varies depending on the static pressure (atmospheric pressure) and the effective load volume of the microphone to be calibrated. To perform an accurate calibration, two corrections need to be made. Calculate the correction value using the specified sound pressure level as noted on the supplied calibration chart, and the static pressure (atmospheric pressure) value as read from the supplied barometer when doing the calibration (see “Reference” on pages 17 to 27).

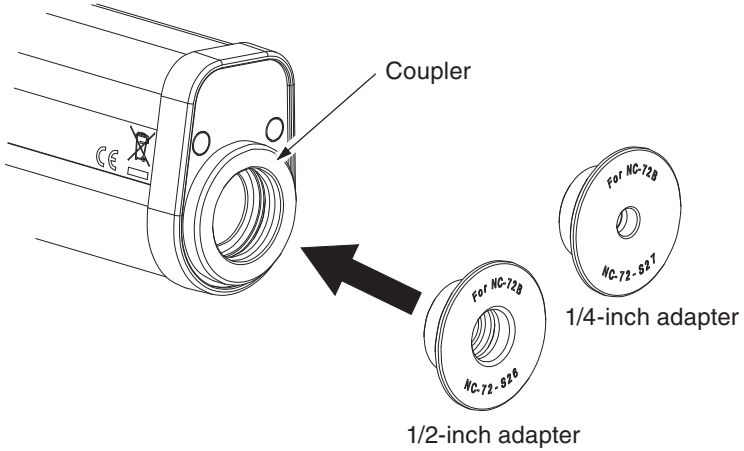
9. When level adjustment is completed, turn the power to the pistonphone off.
10. Carefully and slowly remove the microphone of the sound pressure measurement system (sound level meter) from the pistonphone.

Important
When removing the microphone from the pistonphone, always proceed very slowly and carefully, to avoid the possibility of damage to the microphone diaphragm caused by abrupt changes in air pressure. Also, do not rotate the microphone or the pistonphone while removing. Otherwise the protective grid of the microphone may become loose or detached, causing damage to the microphone diaphragm.

Using the microphone adapters

When the external diameter of the microphone is 1/2 inch or 1/4 inch, use the supplied 1/2-inch or 1/4-inch adapter.

- Insert the adapter fully into the coupler. Otherwise correct calibration is not possible.
- After use, be sure to remove the adapter from the coupler.



Reference

Output sound pressure level compensation

The output sound pressure level generated by the pistonphone depends on a certain extent on the static pressure (atmospheric pressure) and on the effective load volume that is applied due to the mounting of the microphone (this will differ according to the microphone type). When performing calibration, compensation for these two quantities must be provided to determine the exact output sound pressure level.

Change of output sound pressure level according to static pressure (atmospheric pressure)

The output sound pressure p (N/m^2) produced by the pistonphone changes at a rate proportional to the static pressure (atmospheric pressure). In order to calculate the exact sound pressure level, the static pressure at the time of use must be measured, and the sound pressure level given on the supplied calibration chart must be corrected according to the static pressure.

$$p = \gamma \times P \times \frac{2 \times A_p \times S}{V \times \sqrt{2}} \quad \text{..... Equation 1}$$

γ:	Specific heat ratio of air	1.402
P:	Static pressure	Pa
S:	Piston cross section	m^2
A_p:	Cam stroke	m
V:	Coupler volume	m^3

The output sound pressure level L (dB) is expressed by equation 2.

$$\text{Output sound pressure level } L \text{ (dB)} = 10 \times \log_{10} \frac{p^2}{{p_0}^2} \quad \text{..... Equation 2}$$

p_0: Reference sound pressure 2×10^{-5} Pa

The output sound pressure level L (dB) with compensation for static pressure (atmospheric pressure) is expressed by equation 3.

$$\text{Output sound pressure level } L \text{ (dB)} = L_s + 20 \times \log_{10} \frac{P_a}{P_o} \quad \text{..... Equation 3}$$

P_a: Static pressure at time of use kPa

P_o: Reference static pressure 101.325 kPa (reference conditions)

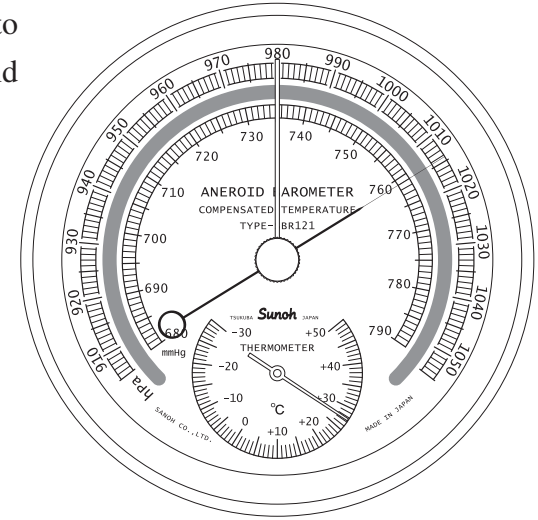
L_s: Specified sound pressure level for microphone in use dB

Output sound pressure level compensation using supplied barometer

The barometer supplied with this unit supports both class LS/M and class 1/M. It can be used to provide compensation of the sound pressure level for a static pressure (atmospheric pressure) range of 905 hPa to 1055 hPa (90.5 kPa to 105.5 kPa).

Place the barometer on a level horizontal surface and lightly tap it with your fingertip to stabilize the needle.

When using the pistonphone, read the current static pressure (atmospheric pressure) from the scale of the barometer and insert the value into Equation 3 (page 19) to calculate the output sound pressure level with compensation.



Important

The barometer is a precision mechanical instrument. Do not tap it too forcefully, and make sure not to drop it.

Microphone effective load volume and output sound pressure level change

Depending on the microphone type, there will be a slight difference in output sound pressure level inside the coupler of the pistonphone. This is due to differences in the microphone prechamber volume and diaphragm equivalent volume, which cause a difference in the total volume of the coupler. (For information on the specified sound pressure level for various microphone types, see the supplied calibration chart.)

For microphones not listed in the calibration chart, the output sound pressure level from the effective load volume (prechamber volume + diaphragm equivalent volume) can be calculated by using the equation given below (approximate value).

1-inch microphone

Output sound pressure level L (dB) = 114.00* + (V_L − 960) × (−0.00041)

V_L (mm^3): Microphone dependent effective load volume (prechamber volume + diaphragm equivalent volume)

1/2-inch microphone

Output sound pressure level L (dB) = 114.00* + ((V_L + 909) − 960) × (−0.00041)

1/4-inch microphone

Output sound pressure level L (dB) = 114.00* + ((V_L + 832) − 960) × (−0.00041)

* Use the specified sound pressure level as noted on the supplied calibration chart (at reference environmental conditions and effective load volume 960 mm^3 (reference load volume)).

Output sound pressure level change according to effective load volume (compensation values)

Microphone type	Change (compensation value, dB)	Remarks
UC-25	−0.08	1-inch microphone
UC-27	−0.03	
UC-34	−0.10	
UC-26	−0.13	1/2-inch microphone Using 1/2-inch adapter (NC-72-S26)
UC-28	−0.09	
UC-30	−0.09	
UC-31	−0.06	
UC-33P	−0.07	
UC-52	−0.03	
UC-53A	−0.09	
UC-57	−0.06	
UC-59	−0.07	
UC-59L	−0.07	
MS-10	−0.09	
MS-11	−0.09	
MS-11A	−0.09	
UC-29	+0.01	1/4-inch microphone Using 1/4-inch adapter (NC-72-S27)
UC-54	+0.01	

Change for other brand microphones (compensation value, for reference)

Microphone type	Change (compensation value, dB)	Remarks
Tokyo Riko MR-103	+0.24	1-inch microphone
Tokyo Riko MR-103 without grid	+0.12	
B&K 4160 without grid	+0.12	
B&K 4180	0.00	1/2-inch microphone Using 1/2-inch adapter (NC-72-S26)

Output sound pressure level compensation (example)

In actual use, the output sound pressure level generated by the pistonphone is calculated by applying compensation for the microphone effective load volume (differs according to microphone type) and the static pressure (atmospheric pressure). The output sound pressure level L (dB) is therefore obtained as follows.

1. When specified sound pressure level L_s (as per calibration chart) is known

$$\text{Output sound pressure level } L \text{ (dB)} = L_s + 20 \times \log_{10} \frac{P_a}{101.325}$$

P_a: Static pressure at time of use (kPa)

Reference static pressure:

101.325 kPa

Example: Output sound pressure level L with UC-59

Specified sound pressure level L_s: 113.98 dB (example, as per calibration chart)

Static pressure at time of use P_a: 98.83 kPa (example, measured with barometer at time of use)

$$\boldsymbol{L} = 113.98 + 20 \times \log_{10} \frac{98.83}{101.325} = \mathbf{113.76\ dB}$$

2. When compensation value C_v for effective load volume of microphone is known

$$\text{Output sound pressure level } L \text{ (dB)} = L_0 + C_v + 20 \times \log_{10} \frac{P_a}{101.325}$$

L_0: Specified sound pressure level (at reference environmental conditions and reference load volume, as noted on calibration chart, dB)

P_a: Static pressure at time of use (kPa)

Reference static pressure:

101.325 kPa

Example: Output sound pressure level L with UC-59

Specified sound pressure level L_0: 114.05 dB (example, at reference environmental conditions and reference load volume, as noted on calibration chart)

Static pressure at time of use P_a: 98.83 kPa (example, measured with barometer at time of use)

Compensation value for effective load volume of microphone C_v: −0.07 dB (as per table on page 22)

$$\boldsymbol{L} = 114.05 + (-0.07) + 20 \times \log_{10} \frac{98.83}{101.325} = \mathbf{113.76\ dB}$$

3. When effective load volume of microphone is known

1-inch microphone

Output sound pressure level L (dB)

$$= L_0 + (-0.00041 \times (V_L - 960)) + 20 \times \log_{10} \frac{P_a}{101.325}$$

1/2-inch or 1/4-inch microphone

Output sound pressure level L (dB)

$$= L_0 + (-0.00041 \times (V_L + V_A - 960)) + 20 \times \log_{10} \frac{P_a}{101.325}$$

L_0: Specified sound pressure level (at reference environmental conditions and reference load volume, as noted on calibration chart, dB)

P_a: Static pressure at time of use (kPa)

V_L: Effective load volume of microphone in use (mm^3)

V_A: Effective load volume with 1/2-inch adapter or 1/4-inch adapter

Load volume with 1/2-inch adapter: 909 mm^3

Load volume with 1/4-inch adapter: 832 mm^3

Reference load volume of microphone: 960 mm^3

Reference static pressure: 101.325 kPa

Output sound pressure level change according to microphone effective load volume: −0.00041 dB/mm^3

Example: Output sound pressure level *L* for 1/2-inch microphone with known effective load volume

Specified sound pressure level L_0: 114.05 dB (example, at reference environmental conditions and reference load volume, as noted on calibration chart)

Static pressure at time of use P_a: 98.8 kPa (example, measured with barometer at time of use)

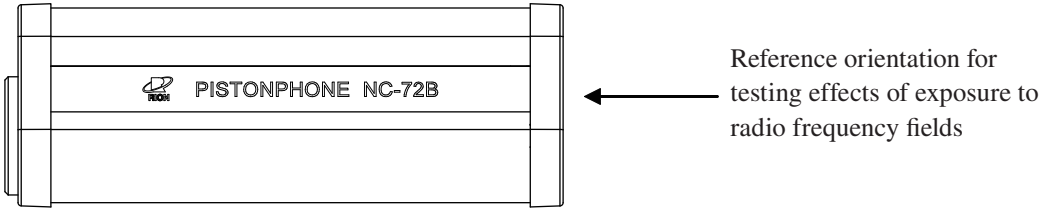
Microphone effective load volume V_L: 224 mm³ (example, according to catalog data for microphone)

$$\boldsymbol{L} = 114.05 + (-0.00041 \times (224 + 909 - 960)) + 20 \times \log_{10} \frac{98.8}{101.325} = \mathbf{113.76\ dB}$$

Electromagnetic compatibility

Reference orientation for testing effects of exposure to radio frequency fields:

Opposite side of microphone insertion opening (see illustration below)



Radio frequency emissions

Electric field strength of radio frequency emissions produced by the unit (quasi-peak value at a distance of 10 m)

Frequency range 30 MHz to 230 MHz: 30 dB (reference 1 µV/m) or less

Frequency range 230 MHz to 1 GHz: 37 dB (reference 1 µV/m) or less

The configuration for greatest radio frequency emissions:

power ON

Immunity to electrostatic discharges

No malfunction after the following electrostatic discharge tests

- Contact discharge: up to ±4 kV (versus ground potential)
- Air discharge: up to ±8 kV (versus ground potential)

Immunity to power frequency and radio frequency fields

Output sound pressure level deviation when placed under the influence of power frequency and radio frequency fields as specified below:

±0.10 dB or less

- Root-mean-square electric field strength up to 10 V/m (non-modulated), frequency range 26 MHz to 1000 MHz, 900 Hz sinusoidal wave, 80% amplitude modulation
- Root-mean-square electric field strength up to 3 V/m (non-modulated), frequency range 1400 MHz to 2700 MHz, 900 Hz sinusoidal wave, 80% amplitude modulation
- Root-mean-square electric field strength up to 10 V/m (non-modulated), frequency range 80 MHz to 1000 MHz, 1 kHz sinusoidal wave, 80% amplitude modulation
- Root-mean-square electric field strength up to 3 V/m (non-modulated), frequency range 1400 MHz to 6000 MHz, 1 k Hz sinusoidal wave, 80% amplitude modulation
- Root-mean-square magnetic field strength up to 80 A/m, frequency 50 Hz and 60 Hz

The configuration that produce minimum immunity (maximum susceptibility) to power frequency and radio frequency fields:

power ON

Specifications

* The tolerance values given in these specifications exclude the uncertainties of measurement.

Applicable standards
IEC 60942:2017 class LS/M, class 1/M
ANSI/ASA S1.40-2006 (R2016) class LS/C, class 1/C
JIS C 1515:2020 class LS/M, class 1/M
CE marking, UKCA marking, WEEE Directive, China RoHS

Specified microphones

Microphones made by RION as well as microphones made by other manufacturers that meet the IEC 61094-1, IEC 61094-4 size specifications

1-inch microphones
1/2-inch microphones (supplied adapter NC-72-S26 is used)
1/4-inch microphones (supplied adapter NC-72-S27 is used)

Reference environmental conditions

Static pressure (atmospheric pressure)

101.325 kPa

Ambient temperature

23°C

Relative humidity 50% RH

Reference load volume of microphone

960 mm^3 (total coupler volume 21245 mm^3 (representative value))

Load volume of supplied microphone adapters

1/2-inch adapter

Model NC-72-S26

Load volume 909 mm^3 (representative value)

1/4-inch adapter

Model NC-72-S27

Load volume 832 mm^3 (representative value)

Sound pressure level variation caused by microphone effective load volume variation

−0.00041 dB/mm^3 (representative value)

Ambient conditions for operation

Static pressure (atmospheric pressure)

65 kPa to 108 kPa

Ambient temperature

–10°C to +55°C

Relative humidity 10% to 90% RH (no condensation)

Ambient temperature range for storage

–20°C to +60°C (no condensation)

Dimensions Approx. 44 mm (W) × 62 mm (H) × 170 mm (D)

Weight Approx. 750 g (including batteries)

Power supply Six batteries

(Alkaline batteries LR6, Manganese batteries R6P, Nickel-hydride rechargeable batteries HR6)

Power supply voltage Nominal: 9.0 V, Max.: 9.9 V

Battery voltage indication

LED lit:	Possible to use (voltage normal)
LED flashing:	Possible to use (voltage low)
LED off:	Not possible to use

Battery life	15 hours or higher (using six LR6 batteries, at reference environmental conditions) 4 hours or higher (using six R6P batteries, at reference environmental conditions) 13 hours or higher (using six HR6 batteries, at reference environmental conditions)
Nominal sound pressure level	114 dB
Specified sound pressure level	As noted on supplied calibration chart (114.0 dB ±0.2dB (at reference environmental conditions, with microphone reference load volume))
Specified sound pressure level tolerance	Using specified sound pressure level on supplied calibration chart as reference, ±0.10 dB (at reference environmental conditions)
Nominal frequency	250 Hz
Specified frequency	As noted in supplied calibration chart (251.19 Hz ±0.10 Hz (at reference environmental conditions))

Specified frequency tolerance

Using specified frequency on supplied calibration chart as reference, ±0.1% (at reference environmental conditions)

Sound pressure level stabilization duration

After power-on: 5 seconds or less (at ambient conditions for operation)

After microphone insertion:

30 seconds or less (at ambient conditions for operation)

Sound pressure level stability (short-term fluctuations)

±0.03 dB (at reference environmental conditions)

[60 s, Time Weighting F (IEC 61672-1:2013, JIS C 1509-1:2017)]

Sound pressure level stability (Influence of power supply voltage)

±0.02 dB (at reference environmental conditions, within power supply voltage range)

Frequency stabilization duration

After power-on: 5 seconds or less (at ambient conditions for operation)

Frequency stability ±0.1% (at reference environmental conditions, 60 s, average time 1 s)

THD + noise rating of generated sound

2.0% max. (22.4 Hz to 22.4 kHz, within ambient conditions for operation)

Influence of static pressure, ambient temperature and humidity

Sound pressure level

within ±0.10 dB (at ambient conditions for operation)

Frequency within ±0.1% (at ambient conditions for operation)

Permissible ambient sound level

94 dB max.

Output sound pressure level compensation for static pressure (atmospheric pressure)

The output sound pressure generated by the NC-72B changes at a rate proportional to the static pressure (atmospheric pressure) (See "Reference" section on page 17). To determine the exact output sound pressure level, the static pressure at the time of use should be measured, and compensation according to the specified sound pressure level data given in the calibration chart should be applied

Specifications of supplied barometer

Measurement range

905 hPa to 1055 hPa (90.5 kPa to 105.5 kPa)

Dimensions 135 mm dia. × 45 mm (H)

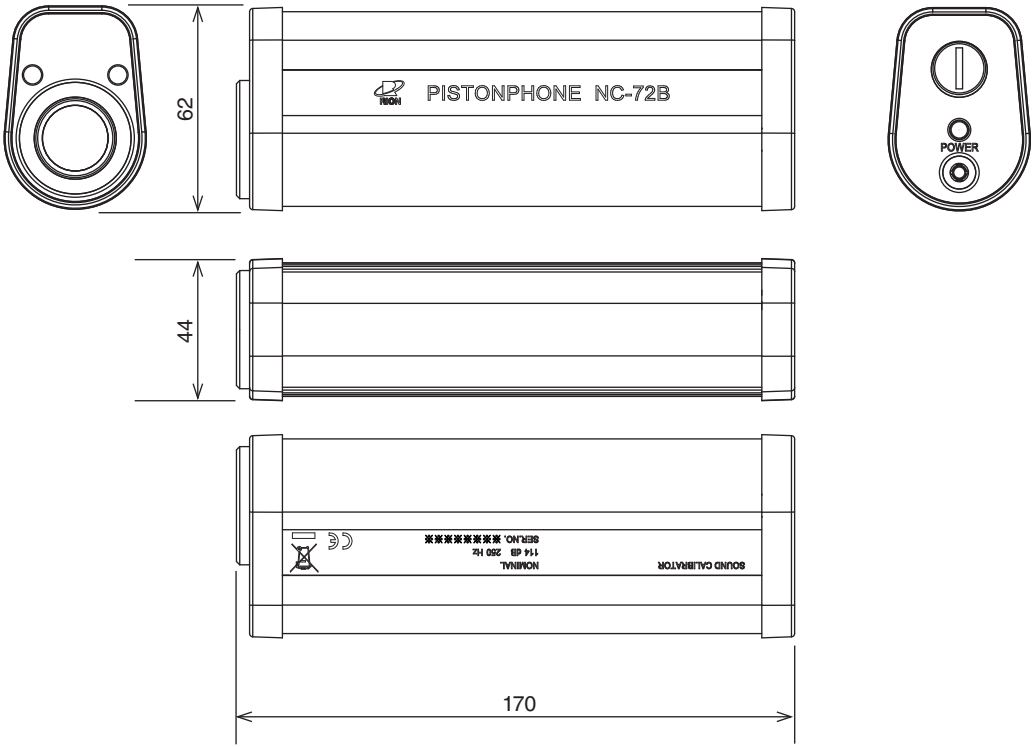
Weight 345 g

Expanded measurement uncertainty

0.02 dB (0°C to +30°C)

Supplied accessories

Carrying case NC-72-210	1
1/2-inch adapter NC-72-S26	1
1/4-inch adapter NC-72-S27	1
Barometer	1
Alkaline batteries (LR6)	6
Instruction manual	1
Calibration chart	1
Inspection certificate	1



Unit:mm

Dimensional drawings

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