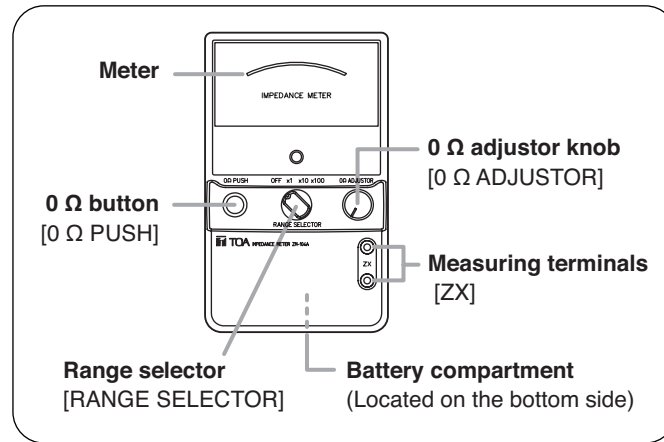


## OPERATING INSTRUCTIONS

# IMPEDANCE METER

## ZM-104A (with carrying case)

Thank you for purchasing TOA Impedance Meter.  
Please carefully follow the instructions in this manual to ensure long, trouble-free use of your equipment.



### 1. SAFETY PRECAUTIONS

- Before installation or use, be sure to carefully read all the instructions in this section for correct and safe operation.
- Be sure to follow all the precautionary instructions in this section, which contain important warnings and/or cautions regarding safety.
- After reading, keep this manual handy for future reference.

#### CAUTION

Indicates a potentially hazardous situation which, if mishandled, could result in moderate or minor personal injury, and/or property damage.

- When leaving the unit unused for 2 weeks or more, be sure to take the batteries out of the unit because battery leakage may cause a fire, personal injury, or contamination of environment.
- Make sure to observe the following handling precautions so that a fire or personal injury does not result from leakage or explosion of the battery.
  - Do not short, disassemble, heat nor put the battery into a fire.
  - Avoid using both new and old batteries together.
  - Do not solder a battery directly.
  - Be sure to use the specified type of batteries.
  - Note correct polarity (positive and negative orientation) when inserting a battery in the unit.
  - Avoid locations exposed to the direct sunlight, high temperature and high humidity when storing batteries.
- Do not forcibly pull the unit if hung by its strap as this may cause the strap to break and the unit may fall off, possibly resulting in personal injury.

### 2. SPECIFICATIONS

Power Supply	AA (R6) battery x 4 (1.5 V DC x 4)
Current Consumption	39 mA
Reading	Direct reading meter, unit: Ω
Measurement Range	x1 range: 5 Ω – 1 kΩ, x10 range: 50 Ω – 10 kΩ, x100 range: 500 Ω – 100 kΩ
Accuracy	± 10%
Oscillation Frequency	1,000 Hz ± 10 %
Battery Life when continuously used	x1 range: 30 hours x10 range and x100 range: 60 hours
Operating Temperature	-5 to +40 °C (23 to 104 °F)
Dimensions	Unit: 110 (w) x 180 (h) x 58 (d) mm (4.33" x 7.09" x 2.28") Carrying case: 120 (w) x 220 (h) x 63 (d) mm (4.72" x 8.66" x 2.48")
Finish	ABS resin, black
Weight	700 g (1.54 lb) (unit and carrying case)
Accessory	Test leads (red and black): 1 set
Measurement Category	CAT I

#### Notes

- Since no batteries are supplied with the unit, prepare them separately.
- The design and specifications are subject to change without notice for improvement.

### 3. GENERAL DESCRIPTION

The TOA ZM-104A Impedance Meter can measure the impedance of speaker lines easily in the same manner as a circuit tester measures resistance. It is equipped with a 3-step Range Selector which permits measuring of the impedance in the range of 5 Ω to 100 kΩ.

### 4. HOW TO USE

**Step 1.** Before use, check to be sure that AA batteries (R6) are inserted correctly into the unit's battery compartment (located on the bottom side).  
Since no batteries are supplied with the unit, prepare them separately.

**Step 2.** Insert the supplied test leads into the measuring terminals.  
The test leads (red and black) have no polarity.

**Step 3.** Set the Range Selector to x1, x10, or x100 range that is most appropriate for your measurement.

**Step 4.** Perform 0 Ω adjustment.  
Adjust the meter pointer to 0 Ω by turning the 0 Ω Adjustor knob while holding down the 0 Ω button. Instead of pressing the 0 Ω button, you may short the test leads. This achieves the same result.

#### Notes

- Perform 0 Ω adjustment each time the Range Selector is switched over to other range.
- The batteries seem to be dead if the meter will not read 0 Ω even by fully turning the 0 Ω Adjustor knob. Replace the batteries with new ones, then perform 0 Ω adjustment again.

**Step 5.** Measure the impedance.  
Keep the unit in a flat or upright stable position, then securely touch the test leads to the speaker lines to be measured.

#### Notes

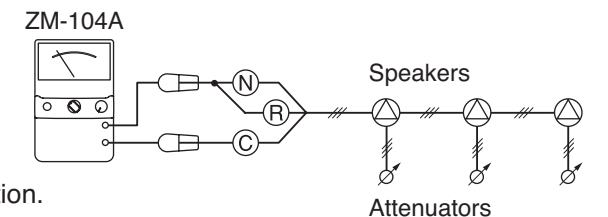
- Do not measure the impedance while the speaker lines are connected to the amplifier as impedance cannot be measured correctly.
- When measuring, check that no voltage is applied to the speaker line. Failure to do so may cause damage to the unit.

#### [Impedance measuring methods in a 3-wire system]

Maximum load impedance of the speaker lines can be measured.  
(This measuring condition corresponds to the state of either All-call or an emergency broadcast.)

#### Note

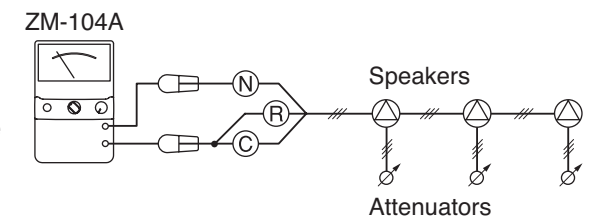
Meter reading is constant, regardless of the attenuator operation.



Impedance can be measured in the status that the attenuators on the speaker lines are operative.

#### Notes

- Entire operation of the attenuators and speaker lines can be checked.
- Meter reading changes with the attenuator switch positions.



**Step 6.** Set the Range Selector to the OFF position after use.  
Otherwise, the batteries run low as current continues to flow through the inner circuit.

#### Note on cleaning the unit

Wipe with a soft dry cloth. If it gets very dirty, use the soft cloth slightly moistened in neutral cleanser. Never use benzene, thinner, alcohol, or chemically-treated cleaning cloth because such volatile liquids could deform or discolor the unit.

#### Traceability Information for Europe (EMC directive 2004/108/EC)

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