# RESISTANCE COMPARISON MODEL

N99-B10-2640-10


## SAFETY INSTRUCTIONS :

- Be sure to read the SAFETY INSTRUCTIONS below before using the product. Use the product properly. Keep the manual in a safe place after reading it.
- These SAFETY INSTRUCTIONS are given to prevent harm to the user and other people, and damage to property. Be sure to observe them.

## WARNING ⚠

- Use of fire may cause extensive damage to the product.
- Disassembling the product may cause electric shock. Do not disassemble.
- Getting the product wet may cause electric shock or breakdown of the product. Do not get it wet.
- If children use this product, a guardian or instructor should teach the handling procedures. Even in using it, the guardian or instructor should check for proper use as instructed.
- Do not use if the product generates abnormal odors, heat, discoloration or deformation in unusual conditions during use or storage.
- Do not disconnect the bulbs and touch the electrode with a finger during use.

## CAUTION ⚠

- Do not store the product in a dusty or hot place.
- Do not use or leave the product in a place exposed to intense direct sunlight, such as a car under a hot sun, or any other hot place. Otherwise, it may become deformed or defective.
- Do not place the product on an unstable base or a tilted surface when conducting an experiment.
- Do not apply intense shocks to the product or throw it.
- Do not use the product with the terminals short-circuited.
- Do not use any other lighting than as specified for this product.
- Never connect any other power source than the handheld generator (12V DC) to this product. Inputting voltage exceeding 12V DC may break the product.

LOOK US UP ONLINE

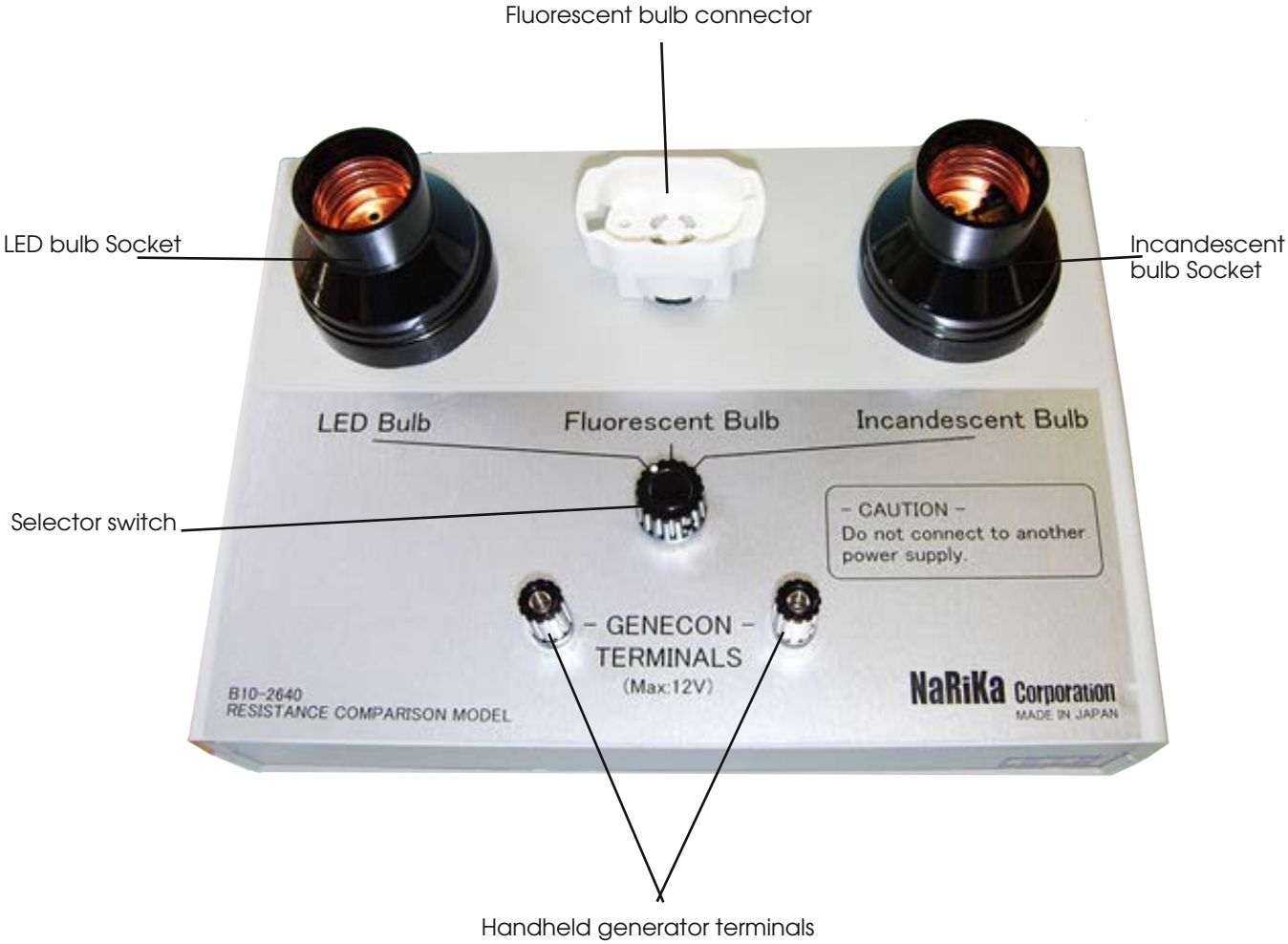
**Manual of Operations**

**IMPORTANT!**
**Read the following before using this equipment:**
*Carefully follow all instructions and observe all precautions given in this manual*

# SPECIFICATIONS :

- Experiment box body
  - Size: 245 × 175 × 100 mm (L x W x H)
  - Material: ABS
- Incondescent bulb
  - Voltage: 12 V
  - Power consumption: 20 W
  - Socket type: E-26
- Fluorescent bulb
  - Power consumption: 18 W
  - Lighting method: Inverter type
- LED bulb
  - Input voltage: 10–15 V DC
  - Power consumption: 2.5 W (equivalent to 20 W incandescent bulb)
  - Size: 100 mm × 52 ϕ
- GENECON™12


## COMPONENTS:



# USAGE :

## PREPARATION:

- Connecting bulbs

Connect the special bulb for the handheld generator, fluorescent lamp, and LED lamp supplied with the product according to the markings on the product.

Connecting fluorescent bulb

Connecting bulb

All bulbs connected

- Connecting GENECON™12

Clip on the GENECON™12 cable to the GENECON™12 terminals.

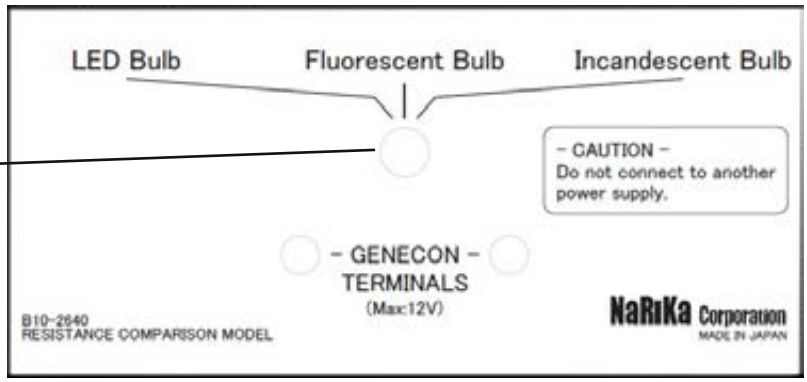
* This product has no polarity.



## USAGE:

1) Select the bulb to be turned on with the selector switch.

Selector switch




(2) Rotate the GENECON™12 to generate power to turn on the bulb.

* Rotate it slow at first and then faster when turning on the special bulb for the GENECON™12.

(3) Select three bulbs with the selector switch and turn them on with the GENECON™12.

# RELATIONSHIP BETWEEN VARIOUS BULBS AND HANDHELD GENERATOR :

The electric bulb, fluorescent bulb, and LED generate light in very different ways.

## ELECTRIC BULB:

The electric bulb is lit by converting electric energy into heat and light. In terms of brightness, it is dark and also wastes power. With this product, you may experience inefficient lighting using the handheld generator (GENECON™12) plus consumer a lot of power..

## FLUORESCENT BULB:

The fluorescent bulb utilizes ultraviolet light generated when electrons hit the enclosed mercury gas and the fluorescent paint applied internally emits light. In comparison with the electric bulb, it consumes very little power (about 1/4) for yielding the same brightness. This product provides bright light at a consumption as low as 18W. And as only relatively light rotation of the handheld generator (Genecon) is needed to light this bulb, it is highly efficient.,

## LED:

LED is a very efficient lighting that requires about 1/10 the power to yield light equivalent to a 20 W incandescent bulb. A blue light diode is covered with fluorescent material, which receives light from the blue light diode and emits light. This is the principle of the LED. It consumes very low power by nature and offers a long service life. Thus, it is watched with keen interest.
It is lit very easily in comparison with the bulb, and you may experience bright light for the energy generated by the handheld generator (Genecon) with this product.

# MAINTENANCE :

- Upon completion of an experiment, disconnect the bulb, fluorescent bulb, and LED and store them. Protect them with packing material, etc. to not break them, if they are stored in the connected condition.
- Wipe the panel with dry cloth or lightly with wet cloth if it is remarkably dirty. If solvent, etc., is used, the printing may peel off.
- Store the product in a place with little dust, etc..

# TROUBLESHOOTING :

## The bulbs are not lit :

- The bulb has run down or is broken, buy a new lbulb.
  Spare parts:
  - P70-0249-01 LED bulb (12V)
  - B10-2640-01 Special bulb (12V, 20W)
  - B10-2640-02 Fluorescent bulb
- The cable of the handheld generator (GENECON™12) is not connected to the terminals firmly.
  Check the connection with the terminals and retry the experiment.
- Incomplete connection
  Check again if the bulb, fluorescent bulb, and LED bulb are connected completely.
- Internal circuit is broken.
  If the bulb is not lit even if the connection and mounting are proper, the internal circuit may be broken. Contact the manufacturer.

## GENECON$^{12}$ is hardly rotating or cannot be rotated :

- Gears are broken.
  The gears in the GENECON™12 may be broken, resulting in bad rotation. Consider whether the inner gears should be replaced. Spare gear set for GENECON™12 is available.

- Short circuit
  The circuit may be short-circuited for some reason. Consider it if the handle is too stiff.
  Check the cable of the GENECON™12 and the terminals of the experiment box. If the product is not repaired, contact the manufacturer.
  When the selector switch is set to the bulb, the GENECON™12 rotates very stiffly. Check whether the bulb goes on in such a case. * It is necessary to rotate the GENECON™12 at high speed for a while until the bulb goes on.