

B10-2632 Genecon DUE

NaRiKa
SCIENCE IS JUST THERE

Thank you for buying the NaRiKa Genecon DUE
Please pay attention to the following precautions to enjoy the experiment.

【 Precautions 】

- Do not expose the product to open flame or fire. Do not spill water on the product.
- Do not store the product in high-temperature and/or high-humidity environments.
- Do not drop the product. The impact may damage the product.
- Be careful of electrical shock. In particular, experiments where several units of Genecon are connected generate very high voltage, posing the danger of electrical shock.
- Do not use the product for other purposes than the experiment in science class. (e.g. charging a cell phone)
- Turning the handle suddenly with the short circuit condition or with a small resistance attached may damage the product. Be careful.
- The pole changes according to the direction of the turn. Be sure to confirm the pole before making the connection.
- If the inner gear breaks, use the [Repair gear set for the Genecon DUE].



Contents of the set

- Genecon DUE
- Dedicated cable
- A/B seals (To be used for two units at the same time)

How to use the Genecon DUE

1. Insert the connector for the dedicated outlet into the Genecon DUE.
Be sure to insert it all the way as in an outlet.
2. Hold the Genecon DUE in one hand and turn the handle to generate electricity.
Connect the plastic covered clip of the dedicated cable to the experimental devices

[Precaution on pole]

The polarity of the Genecon DUE changes according to the direction that the handle is turned.

Turn the handle to the right. : The upper part of the connector is plus and the lower part is minus.

Turn the handle to the left. : The upper part of the connector is minus and the lower part is plus.

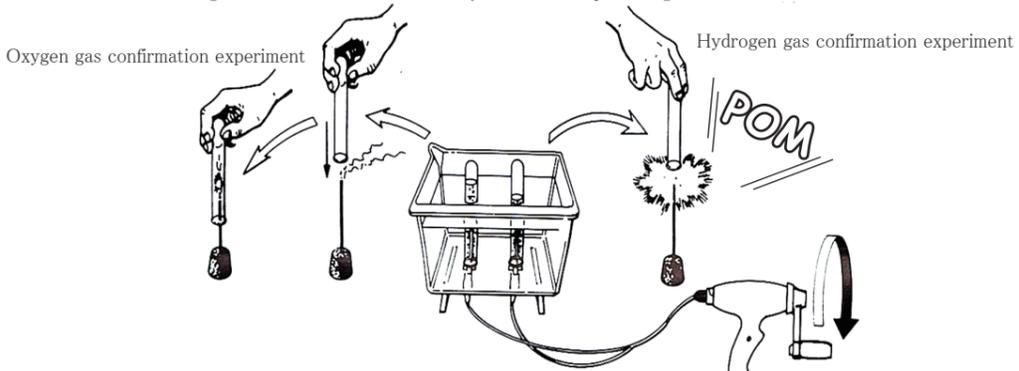
* Refer to the color of the cable to determine the upper or lower side of the connector for the dedicated cable and the polarity of the plastic covered clip.

Experimental devices that use the Genecon and examples of experiments

1. Electrolysis experiment

Use the Genecon as the power source for the electrolysis device to perform electrolysis of water or the like. When you get flame near the gas accumulated in a test tube, the sound "pon" is emitted if the polarity is minus. When an incense stick is exposed to the gas with plus polarity, the incense stick will burn with a flame.

Relevant goods F35-1305 Electrolysis device for junior high school students EA-400N



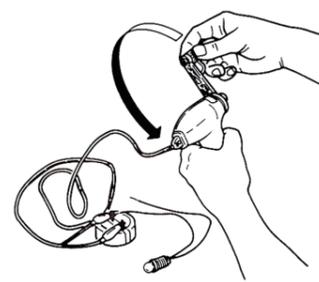
2. Electric discharge experiment

●P70-0575 Experiment using 1F condenser

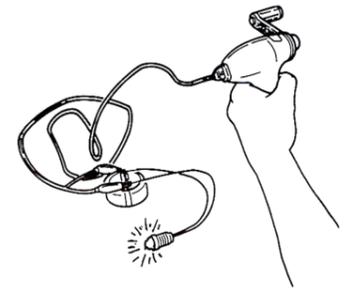
Charge the 1F condenser using the Genecon. Then, when releasing the handle, the handle turns by itself and grinds to a halt after discharge. Also, when the Genecon is removed after the charge and a small lamp is connected, the lamp will glow and then grow dim after discharge.

These experiments are considered energy conversion.

Charge the 1F condenser.



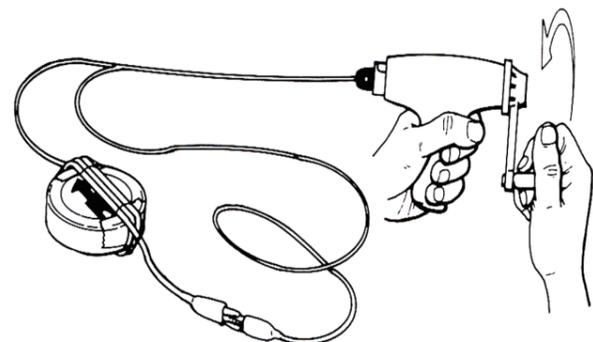
Remove the Genecon from the charged condenser and a small lamp is connected to the condenser.



3. Electric current and magnetic field experiment

Use of the Genecon as a battery allows the experiment to be repeated.
You can be clearly aware of the electric current by turning the Genecon.

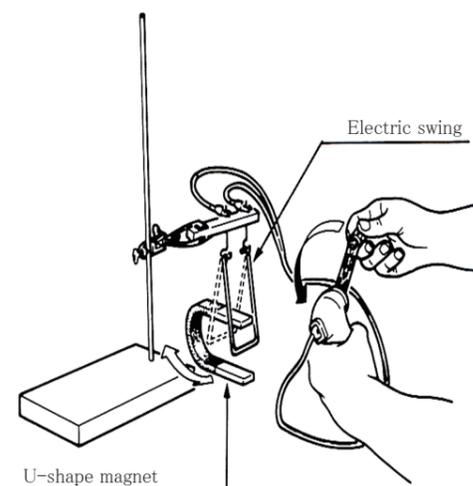
Wind one of the lead wires around the transparent case in the direction of the magnetic needle (for projection) and secure it with tape. Be sure the N and S poles of the magnetic needle come over the lead wire.



Relevant goods B10-3570 Direction needle with oil
B10-3590 Direction magnetic needle (For projection)
B10-3600 Direction needle for current test

●Experiment using B10-2631-03 and B10-2631-04 electric swing

Connect the Genecon as shown in the figure below and turn the handle to let the conductor hop forward or backward. When turning the handle the other way, the conductor will hop the other way as well.

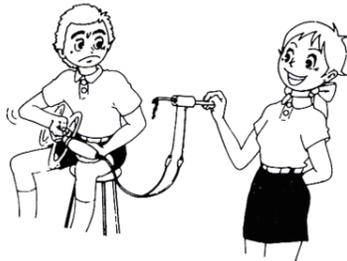


[Specifications of B10-2631-03 Electric swing (with U-shape magnet)]
Swing: Single wire made of copper wire plated with tin
Size of wood handle: 120 x 15 x 10 mm (made of varnished lauan)
Size of single wire: 100 mm (length) x 50 mm (width) 1 mm (thickness)
U-shape magnet: Steel, varnished finish
Size: 50 x 100 mm
Relevant goods: B10-2631-04 electric swing only (six-unit set)

●Experiment with electric magnet using B10-2631-05 coil for the electric magnet

Let's conduct an experiment using an electric magnet with an iron coil

1. Wind the conducting wire around the small plastic bobbin to make a coil for the electric magnet.
2. Connect the Genecon to the terminal of the bobbin and turn the handle.
3. When you bring Gem clips, iron powder, or B10-3720 Mag chips close to one end of the iron coil, the objects will be drawn to the tip of the iron coil.



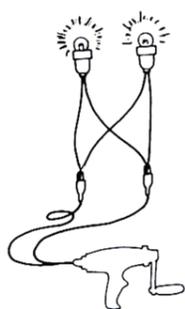
[Specifications of the B10-2631-05 Coil for electric magnets]
 Bobbin: Plastic, 20 mm (diameter) x 27.4 mm (height), 6.9 mm (inner bore diameter)
 Coil: Enamel wire (thickness 0.4 mm, approximately 400 winds)

4. As an experimental device for energy conversion



Let's conduct an experiment as a pair after combining two Genecon units.

The Genecon whose handle is turned will be the generator and the Genecon that rotates will be the motor.

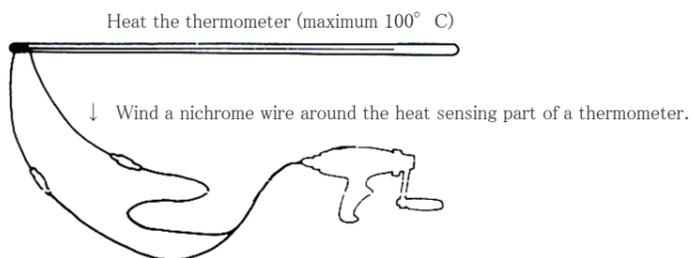


You can feel the resistance from turning the handle when a small lamp is connected one by one in parallel as shown in the figure.

Also, small lamps are used in an experiment of inductive current.

*On that occasion, be careful that the plastic covered clips do not come in contact with each other.

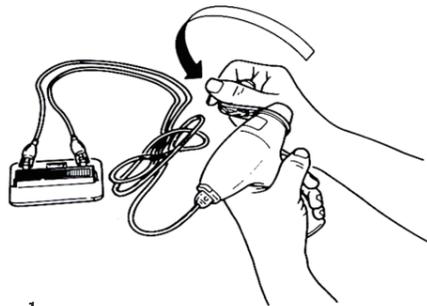
Wind a nichrome wire (0.2 mm) 10-15 times around the heat sensing part of a thermometer and connect both ends of the nichrome wire to the lead wire of the Genecon and then turn the handle of the Genecon.



●B10-2631-01 Resistance with a liquid crystal thermometer (6 resistances)

Attach the Genecon to the resistance with a liquid crystal thermometer as shown in the figure and turn the handle to see the scale of the liquid crystal thermometer change.

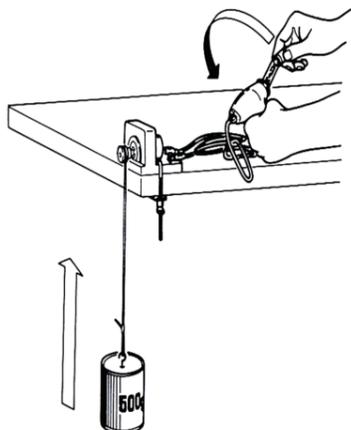
[Specifications of B10-2631-01 Resistance with a liquid crystal thermometer (6 resistances)]
 Temperature range: 10° C to 56° C
 Heater: Cement resistance 20 W, 5 Ω
 Outer size: 50 x 80 x 20 mm



●B10-2631-08 Motor with a stand

Suspend a thread from a pulley of the motor with a stand and attach a weight to it.

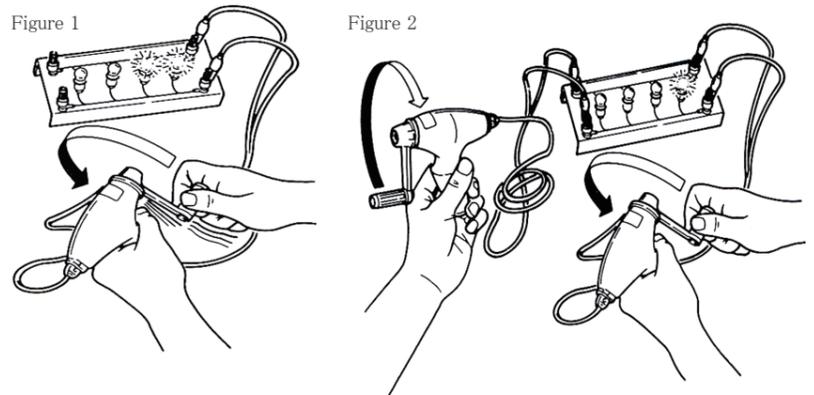
Then, turn the handle of the Genecon to elevate the weight. In this case, the Genecon works as a generator and activates the motor to elevate the weight.



●B10-2631-02 Experiment of electricity generation using the parallel small lamp stand

Figure 1 shows the parallel small lamp stand where four small lamps are attached in parallel. While one person turns the handle of the Genecon and the other person turns on the small lamps one by one, the change in the resistance of the handle can be felt.

Figure 2 shows two Genecon units connected to the above parallel small lamp stand. Two persons hold each Genecon. When one person turns the handle of one Genecon at a constant speed, the handle of the Genecon held by the other person will start to rotate at almost the same speed. Then, as the person who holds only one Genecon turns on small lamps one by one, the rotating speed of the handle slows gradually. This experiment is useful to understand electricity generation and work and loss in energy conversion.

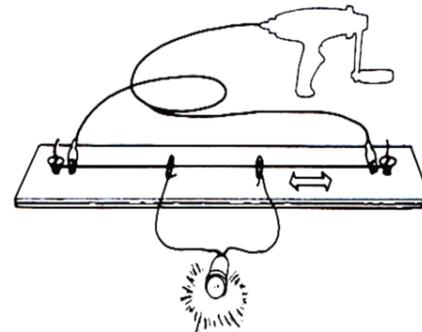


[Specifications of B10-2631-02 parallel small lamp stand]
 Stand: Transparent acryl stand, four small lamp holders with terminals
 Accessory: Small lamp (3.8 V/300 mA) x 4, Size:180 x 80 x 25 mm

5. For teaching how to use direct current voltage meter and direct current ampere meter and for an experiment involving Ohm's Law

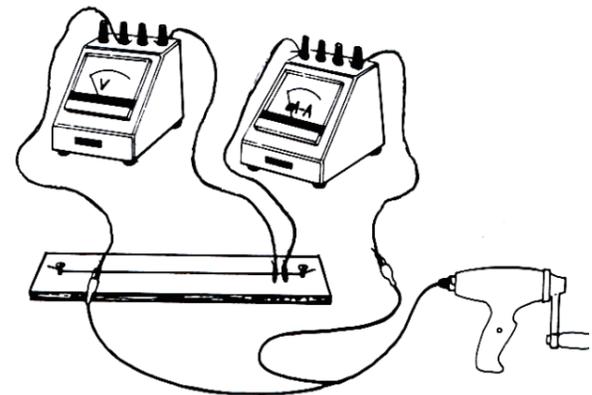
●B10-2631-06 Experiment using Ohm's Law experimental device

This experiment is conducted by a pair using nichrome wire as resistance as shown in the figure. Attach the plastic covered clips of the lead wire extending from the small lamp socket onto any place on the nichrome wire. While the handle of the Genecon is being turned, one clip is fixed and the other clip slides on the nichrome wire. You can observe as the brightness of the small lamp changes regularly.



When the Genecon is used as a power source in an experiment using a direct current voltage meter and a direct current ampere meter, experimental devices can be rarely damaged by pupils or students who are unfamiliar with power source devices.

In the experiment involving Ohm's Law, a nichrome wire is used as resistance and the experiment is conducted by a pair. Turn the handle of Genecon at a constant speed and record the voltage and the amperes. Next, change the speed (constant speed) and record the voltage and the amperes. Make a graph that shows the voltage and amperes to calculate the resistance of the nichrome wire.



[Specifications of B10-2631-06 Ohm's Law experimental device]
 Wood stand: Lauan-made, size: 500 x 40 x 12 mm
 Resistance wire: Nichrome wire (diameter 0.2 mm, length some 470 mm)
 Accessory: Small lamp holder with lead wire (with plastic covered clip) x 1, small lamp (3.8 V, 300 mA) x 1, spare resistance x 1

* This explanation cited as reference examples of experiments from [Start of Hand Turning Electricity Generation (Experiments with the Genecon) written by Norikazu Osumi and published by Kihara Shozou Dou (1978) and also from Kouji Hashimoto.