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Teaching guide in digital format

Minimum invoiced order: € 130,00 + VAT

The transfer of energy

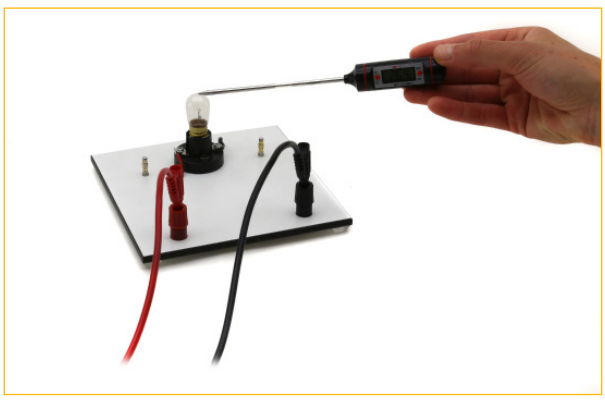
NEW

8140

Everyone knows that energy in the Universe is conserved, but have we ever wondered how this is possible? The answer is: through the transformations of energy.
In fact, energy exists in different forms and the conversion from one form to another allows its conservation.
With this kit it is possible to experience the main forms of energy and the different transformations that involve them: from the transformations of mechanical energy with and without the transport of matter, through the transfers of thermal energy through work and through the phenomena of irradiation, conduction and convection.

Topics

- Conservation of mechanical energy
- Mechanical energy transfer
- Mechanical energy transfer with material displacement
- Mechanical energy transfer without moving matter
- Mechanical waves
- Internal energy
- Molecular thermal agitation
- How to transfer thermal energy with work
- Other ways to transfer thermal energy
- Thermal conduction - heat
- Convection
- Thermal radiation
- Electromagnetic waves
- The principle of thermal radiation
- Irradiation and temperature
- The irradiation and the state of the surfaces
- The thermal equilibrium by radiation
- Solar radiation
- Solar energy incident on earth
- The greenhouse effect
- Air pollution
- Global warming



8140

MECHANICAL ↔ ELECTRICAL

Hydraulic turbine 5314

This model of hydraulic turbine permits to demonstrate the conversion of potential hydraulic power in electrical power, without using water sources.
It is fitted with an immersion pump which takes the water from the small basin and throws it against the turbine blades generating a continuous cycle. A voltmeter measures the voltage at the clamps of the dynamo and the electrical power produced can switch on a LED or make a small electric motor fitted with blade rotate.
The pump needs a continuous 12 V voltage. The use of power supply cod. 4991 (not supplied with the instrument) is suggested.

5314

Air generator 5316

Thanks to this generator it is possible to make work the wind turbine even in the

5316

Wind turbine model 5315

Used to demonstrate the conversion of wind kinetic energy into electrical power. Exposing the turbine to the wind, the movement power is transmitted to a small generator that transfoms it in to electric power.
Size: 25 x 25 x 30 cm.

5315

Small electrical motor 5276

Supplied in an assembly kit. Working with 3-6 V dc voltage. Suitable to develop practical capacities of students and make them understand how an electrical motor works.

5276

AC/DC motor generator, demonstration model 5803

It is an excellent demonstration model for studing electric current eneration. The generator produces AC/DC current when the hand wheel is turned. The presence of AC/DC voltage is visualized by lighting of bulbs. Cables included.

5803

THERMAL ↔ MECHANICAL

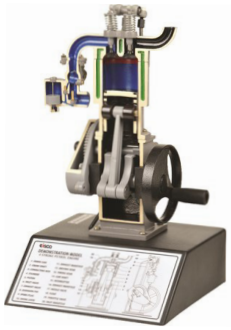
Two-stroke engine 2071

Operating section of a two-stroke engine with carburettor. Turn the crank handle, the spark of the candle coincides with the switch on of a light bulb powered by a 4,5 volt battery.

2071

Four-stroke engine 2101

This model shows the internal structure and the principle of operation of a diesel four-stroke engine water cooled.
Acting on the crank handle, the moving engine parts are visible. A light bulb simulates the spark of the spark plug (requires as a power supply 2 AA batteries not included).



2101

Diesel engine 2102

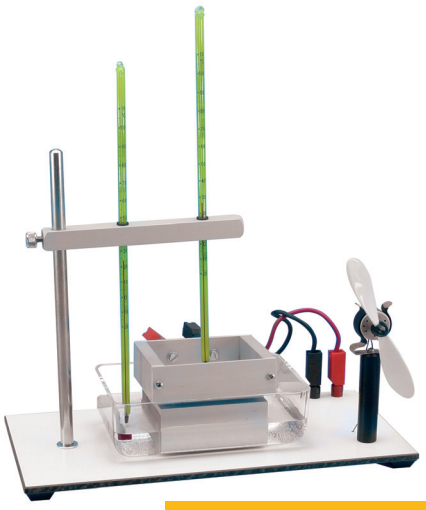
This model shows the internal structure and the principle of operation of a diesel four-stroke engine water cooled.
Acting on the crank handle, the moving engine parts are visible. A light bulb simulates the spark of the spark plug (requires as a power supply 2 AA batteries not included).

2102

ELECTRICAL ↔ THERMAL

Thermoelectric generator 5350

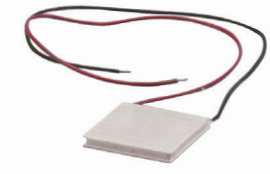
The sensitive part of this item consists of a Peltier cell. It is in contact on one side with a small aluminium wing to be immersed in hot water, on the other side with a small basin to be filled with ice and cold water. Due to the Seebeck effect, the difference in temperature produces a difference in potential that is noticeable at the terminals, this difference can make a small electric motor work: applying a difference in potential to the terminals (max 12V), due to Peltier effect, a great difference in temperature is set between the two faces of the ceramic bloc



5350

Peltier's cell 5374

It consists of 144 doped silicon bars, serial connected and close in a ceramic block.
Maximum voltage: 12V.



5374

RADIANT ↔THERMAL

Solar water heater 2000

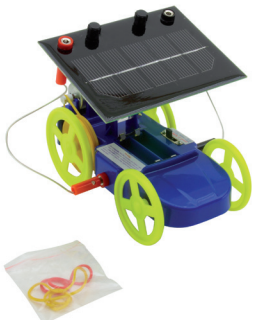
It is a model of the domestic use devices. Thanks to this item you can heat water by means of sun radiant power.
An immersion pump, working at 12 Vcc, make the water circulate in the heating coil of the solar panel.
After a few minutes it is possible to notice an increase in temperature.
It is supplied with a transformer.
The proposed experiment can be carried out using the temperature sensor (not supplied) Cod. 12903-00

2000

RADIANT ↔ ELECTRICAL ↔ MECHANICAL

Model of solar vehicle 5319

This model gets electric power from the solar panel.
When it is exposed to the sun it starts to move autonomously.



5319

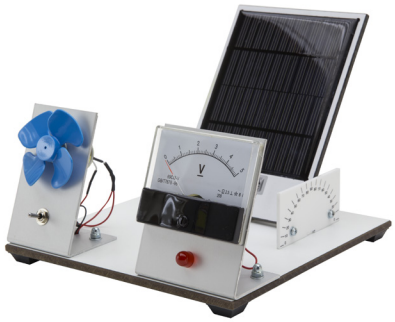
Solar energy motor 5317

Exposing the item to the sun, the panels convert solar energy into electrical power which can be used to make the disk rotating.
Size: 100x120 mm.

5317

Photovoltaic panel 5318

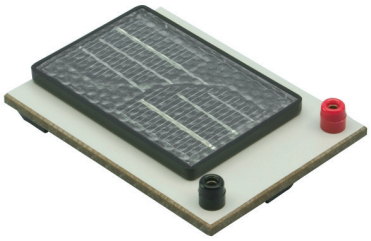
Exposing the panel to the sun you will get the transformation of solar power into electrical power thanks to which the motor starts to rotate, or a light bulb switches on. The panel is tilted and supplied with a protractor so you can easily evaluate its performance according to the angle of the solar rays incidence.



5318

Photovoltaic panel with base 5311

Suitable for rendering measurements.
Panel size: 10 x 6,5 cm.
V_{DC}max = 1,3 V.



5311

Fuel cell with separable devices 5412

This item permits measurements concerning conversion of light power into electrical energy.
The light energy produced by a 75 W lamp(similar to solar energy) is converted into electrical power by a photovoltaic panel.
This electrical energy is used to separate, thanks to a PEM electrolytic cell, (Proton Exchange Membrane) water molecules in the constituent components (with an increase in chemical potential energy contained in hydrogen and oxygen gases).
The two gases are mixed again through a PEM fuel cell, producing water and electric energy again, which is used to operate a fan (mechanical energy) by a small electric motor. The two PEM cells are identical and are both used as electro-chemical converters, once in a direction and then in the opposite.
The measurement of electrical quantities can be performed by means of two multimeters. it is possible to detect as vary the electrical quantities during the operation, making use of voltage and current sensors.

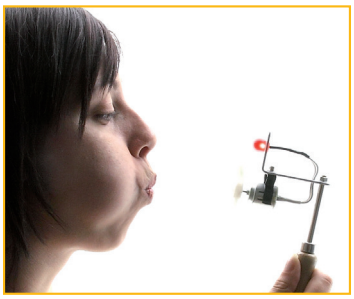
Equipment supplied

- 1 Base
- 1 Projector
- 1 220 V - 75 W lamps
- 1 Solar panel
- 1 PEM electrolytic cell with tanks
- 1 PEM fuel cell
- 1 Small motor with fan
- 2 Analogical portable multimeter
- 4 Electrical leads
- 1 Syringue
- 2 Taps
- 4 Adaptors
- 1 Distil water bottle
- 2 Tubes
- 2 Plugs

5412

Wind device 5423

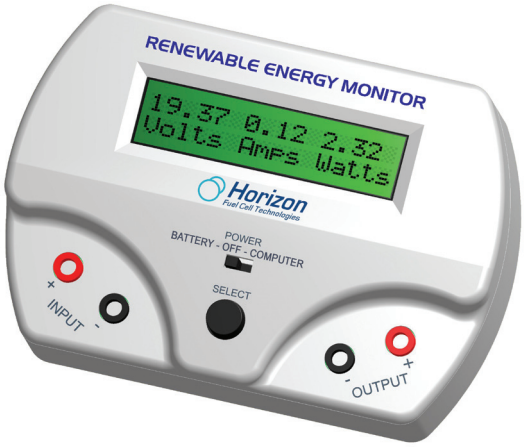
Blowing on the blades, a LED turns on to show that wind power has transformed into electric energy.



5423

Renewable Energy Monitor HZ07

Monitoring device with LCD display, designed to detect via PC the performances of all fuel cells and demonstration kits. Possibility to evaluate real-time voltage, current, power, resistance and even kit rotation speed with miniature wind turbines. The tool also works with battery power, can be used with or without a PC and away from electric energy sources.



HZ07

Hydro-Wind Kit HZ08

Capture wind power!
With this kit you can use the energy produced by a wind generator to power a fuel and hydrogen cell.

HZ08

Wind Energy Science Kit HZ10

Miniature wind turbine designed to assess how different quantities, sizes and blade angles influence the amount of energy produced. This kit contains 4 different models of blades, a special 3-phase AC alternator and a small device equipped with a LED voltmeter and a module for the reproduction of musical sounds.

HZ10