## Elementary circuits kit 5422

This kit enables beginners of the study of the electrical physics, to do experiments on the simplest electric circuits.

Topics

- Lamp with switch;
- Lamps in series;
- Lamps in parallel

Equipment supplied

1 Battery holder - 4 positions
2 Knife switches
2 Lamps with lamp holder - 6V
6 Leads

5422

## Electrical leads, safety plugs

Available in black or red
Type: banana - banana
Diameter: 4 mm.
Max current: 8 A
Max voltage: 1000 V
Metal part with protective retractable sheath in order to avoid accidental contacts.

| | |
|---|---|
| Single, length 25 cm | 5160 |
| Single, length 50 cm | 5161 |
| Single, length 100 cm | 5162 |

5160 - 5161 - 5162

## Set of 10 cables 5191

Type: crocodile - crocodile
Length 50 cm. Max current: 5A.

5191

## Rack for cables 5325

24 spaces, it can be fixed to the wall.

## Knife switch 5147

Max voltage: 12 V. Max current: 5 A.

5147

## Lampholder 5164

Lampholder with two 6 V lamps.

5164

## Bulb E10 12V-3A 5271

Suitable for bulb-holder code 5164.

5271

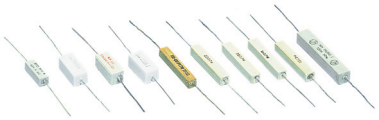
## Bulb E12 6V/2W 5010

To be used with bulb-holder code 5009.

5010

## Series of 10 resistors 5176

Values Ω: 10 - 12 - 15 - 18 - 22 - 56 - 68 - 100 - 120 - 150.
Power: 5 W. To be used with bases code 5056 (sold separately) in order to produce batteries in series and in parallel.

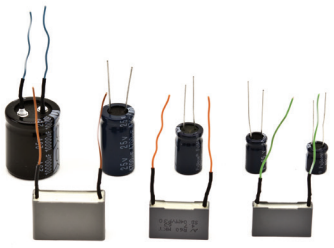


5176

## Set of 10 capacitors 8502

To be used with bases code 5056, sold separately, in order to constitute batteries in series and in parallel. Maximum voltage: 25V.
Equipment supplied:

2,2 µf - 1 pz
4,7 µf - 1 pz
10 µf - 1 pz
470 µf - 1 pz
1.000 µf - 2 pz
2.200 µf - 2 pz
4.700 µf - 1 pz
10.000 µf - 1 pz



8502

## Nickel-chrome wire 5076

Length 100 cm.
It has terminal piston pins to make tests on Ohm's laws.

5076

## Black crocodile clip 5062N
## Red crocodile clip 5062R

5062N - 5062R

## Crocodile clip 5192

With insulation, with button.

5192

## Lamp holder E12 on base 5009

To be used with code 5010.
Dimensions: 103x54x30 mm.

5009

## Switch on base 5008

Dimensions: 103x54x30 mm.

5008

## Deflector on base 5136

Dimensions: 103x54x30 mm.

5136

## Rheostat 22 Ω on base 5132

Dimensions: 103x54x30 mm.

5132

## Inverter on base 5137

Dimensions: 103x54x30 mm.

5137

## Resistor-holder and Capacitor-holder base 5056

Dimensions: 103x54x30 mm.

5056

## Silica diode on base 5146

Dimensions: 103x54x30mm.
It can straighten up a half-wave.

5146

## Thermistor NTC on base 5144

Dimensions: 103x54x30 mm.
Its resistance varies with a negative temperature.

5144

## Thermistor PTC on base 5389

Dimensions: 103x54x30 mm.
It's resistance with a positive temperature.

5389

## Photoresistor on base 5133

Dimensions: 103x54x30 mm.
It varies its resistance as a function of the light received.

5133

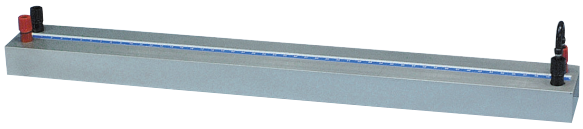
## Series of conductors 5098

For the verification of Ohm's laws. Dimensions: 1000 x 100 mm.
Composed of:
1 Kanthal wire, Ø 0,30 mm; 2 Nichel-chromium wire, Ø 0,3 mm; 1 Constantan string wire, Ø 0,4 mm; 1 Bridge; 1 Base.

5098

## Ohm's law table 8504

To be used with the set of wires code 8503 (see above) in order to test Ohm's laws. Dimensions: 500x60 mm.
It is supplied with a short-circuit bridge.



8504

## Set of 4 metal wires 10 m 8503

Composed of:

| | | | | | |
|---|---|---|---|---|---|
| Nichel | 1,376 Ω/m | Ø 0,3 mm | Nichel-Cromo | 15,63 Ω/m | Ø 0,3 mm |
| Constantan | 3,918 Ω/m | Ø 0,4 mm | Kanthal | 19,45 Ω/m | Ø 0,3 mm |

8503

## Kit for experiments on the electric circuits 5130

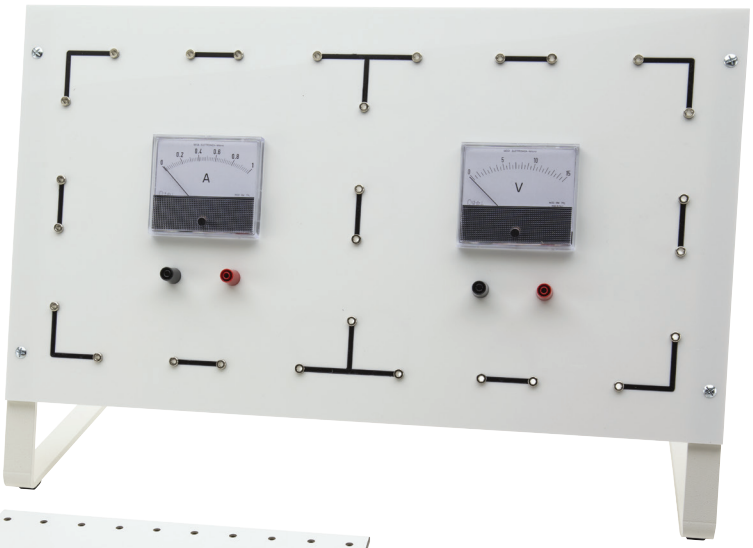
To be used with an electric, low-voltage power unit ,which can be adjusted from 0 to 12V DC.
Structure made of painted metal.Panel dimensions: 57x33 cm.

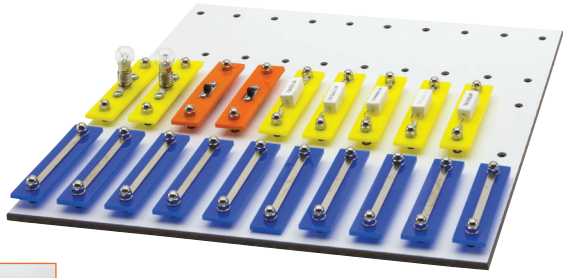
### Topics

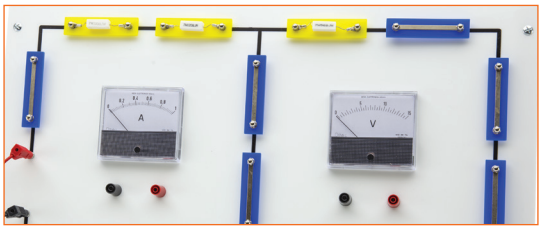
- The electric circuit
- Use of the instruments
- Verification of Ohm's first law
- Dependence of resistance on temperature
- Lamps in series
- Lamps in parallel
- Resistances in series
- Resistances in parallel
- Electrical net

### Equipment supplied

| | |
|---|---|
| 4 Electrical leads 30 cm | 2 Bridges with switch |
| 2 Electrical leads 100 cm | 1 Resistor bridge = 12 Ω |
| 2 Iron holders for panel | 1 Resistor bridge = 18 Ω |
| 1 Panel with instruments | 1 Resistor bridge = 56 Ω |
| 1 Plate for circuits | 1 Resistor bridge = 100 Ω |
| 10 Bridges with short-circuit | 1 Resistor bridge = 120 Ω |
| 2 Bridges with lamp | |



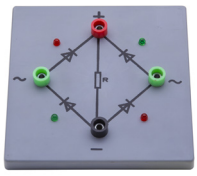




5130

## Graetz's bridge 5233

The item is mounted on base 100x100 mm. It can strighten up two half-waves, visualizing the conduction state of the diode through the use of LED.



5233

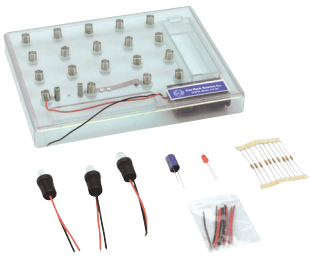
## Resistances box 5270

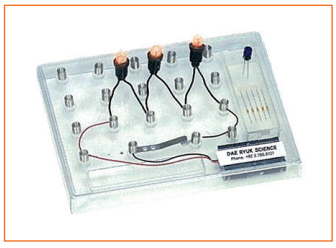
With six decade boxes.
Percentual mistake 0,1%.
Plastic case.
Measurement range: from 0 to 1.111.110 Ω with 1 Ω step.

5270

## Board for simple electric circuits 5712

This apparatus enables you to create connections in series and parallel between different electrical dipole, such as light bulbs, resistors, condensers, leds, etc. simply through the use of spring connectors. It includes a small space to store all different components and a battery-holder to insert two AA type batteries.



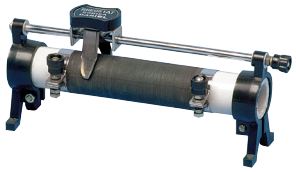


5712

## Linear didactic rheostats

For voltages up to 24 V.

| | |
|---|---|
| Resistance 10 Ω Max current 2 A | 5218 |
| Resistance 50 Ω Max current 1,5 A | 5219 |
| Resistance 200 Ω Max current 1,5 A | 5220 |



5218 - 5219 - 5220

## Support for mounting boards 5333

For a better view of the circuits assembled on the table.
It should be used with codes 5332 and 5334.

5333

## Modular kit to study electric circuits 5332

This modular kit enables the performance of many experiments on electrical conduction, reducing to a minimum, the use of connecting cables. In this way, besides simplifying the operating production of circuits, their layouts are highlighted. We suggest our power supply code 4991, not supplied with this apparatus.
Assembly table dimensions: 45x33 cm

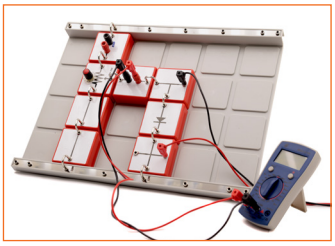
*14 feasible experiments*

### Topics

- Bulb with switch
- Protection fuse
- Bulb Series with single point
- Parallel Bulbs with single point
- Parallel Bulbs with 2-way switch
- Bulbs with dual control with 2-way switch
- Bulbs with dual control with relay
- Use of the voltmeter and the ammeter
- First ohm's law
- Second ohm's law
- The rheostat
- The potentiometer
- Series circuits
- Parallel circuits

### Equipment supplied

| | |
|---|---|
| 2 Modules with bulb holder | 1 Module with 20 Ω rheostat |
| 2 Bulb 6V 2W | 1 Module with relay |
| 6 Electrical leads 60 cm | 1 10 metres of kanthal wire |
| 1 Assembly table | 1 Couple of resistors 22 Ω - 56 Ω |
| 4 Linear conductors | 1 Nickel-chromium wire |
| 2 L-shaped conductors | 2 Crocodile clips |
| 1 T-shaped conductor | 10 U bolts |
| 1 Set of 4 insulators | 1 Voltmeter DC |
| 2 Modules with switches | 1 Ammeter DC |
| 1 Module with fuse holder | 10 Fuses |
| 4 Universal connectors | 1 Box |



5332

## Modular kit for the study of basic electronics 5334

This modular kit allows the performance of several experiments on electronical principles: from reactive components to semiconductors. The main advantage lies in the minimum use of the connecting cables. In this way, besides simplifying the operative production of circuits, their schemes are highlighted. The function generator (code 5718) required to perform the experiments with alternating current must be purchased separately.
Assembly table dimensions: 45x33 cm.

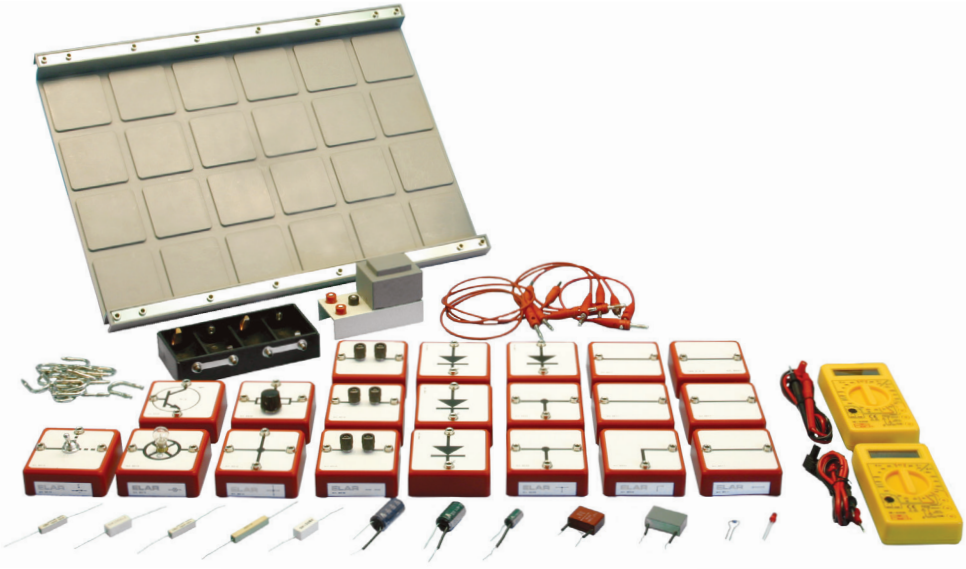
*18 feasible experiments*

### Topics

- The condenser with direct current
- Effective voltage and current
- The condenser with alternating current
- The capacitive reactance
- The inductive reactance
- The RCL circuit
- Low-pass filter
- High-pass filter
- Conductivity in metals and semiconductors
- P-N junction: the diode
- The half-wave rectifier
- The double half-wave rectifier
- The filtered rectifier
- The transistor
- The transistor as interrupter
- The transistor as amplifier
- The photoresistor
- The thermistor

### Equipment supplied

1 Module with bulb holder
1 Bulb 6V 2W
6 Electrical leads 60 cm
1 Mounting boards
5 Linear conductors
1 L-shaped conductor
2 T-shaped conductors
1 Module with deflector
6 Universal connectors
1 Set of 5 different condensers
1 Set of 5 different resistances
1 Module with potentiometer 2 KΩ 2 A
4 Modules with silicon diodes
1 Module with transistor
2 Universal digital Multimeter
1 Cross conductor
16 U bolts
1 Battery holder
1 Module with inductor
1 Photoresistor
1 NTC 47 Ω - 50 Ω
1 Box



5334