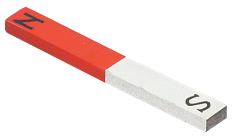
Rectangular magnet 5279
Dimensions: 170x20x10 mm..



5279

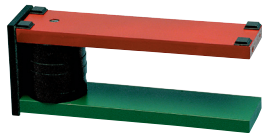
U-shaped magnet
Dimensions: 55x10x14 mm. **5281**
Dimensions: 75x16x40 mm. **5286**

5281 - 5286

Magnet 5206
U-shaped.

5206

U-shaped magnet 5173
Dimensions: 200x75x45 mm.



5173

Al- Ni-Co alloy magnets
Made of cobalt and nickel alloy, these magnets are able to create magnetic fields much more intense than those created by steel magnets.
Moreover, their magnetisation lasts for decades.

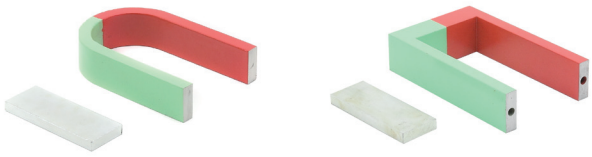
Linear magnets with round section
Dimensions: 60 x 6 mm circular, single. **5238**
Dimensions: 100 x 10 mm circular, single. **5024**
Dimensions: 150 x 12 mm circular, single. **5169**
Dimensions: 150 x 12 mm circular, couple. **5170**

5238 - 5024 - 5169 - 5170

U-shaped magnets with stand
Dimensions: 30 x 20 x 21 mm. Rod Ø 6 x 135 mm **5077**
Dimensions: 45 x 29 x 30 mm. Rod Ø 6 x 135 mm **5141**

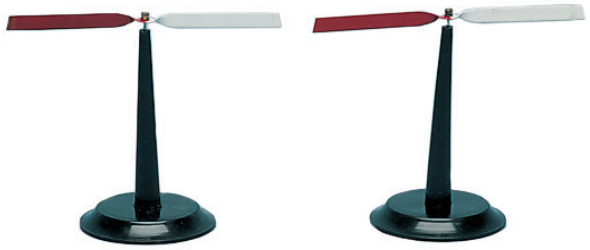
5077 - 5141

U-shaped magnets without stand
Dimensions: 80 x 52,7 x 21 mm. Poles distance: 40 mm. **5382**
Dimensions: 130 x 80,5 x 30 mm. Poles distance: 60 mm. **5383**



5382 - 5383

Couple of magnetic needles 5225
The item can show the interaction between magnetic poles
Needle length: 140 mm. Height: 120 mm.



5225

Disk magnet 5182
SINTEROX/F alloy
Diameter: 18 mm.
Thickness: 5 mm.

5182

Ring magnet 5183
SINTEROX/D alloy
Outer diameter: 51 mm.
Inner diameter: 24 mm.
Thickness: 9 mm.

5183

Neodymium magnets
Made of Neodymium-Iron-Boron alloy, they produce a magnetic field of exceptional intensity (about 1 Tesla).

Disc magnet 8516
Diameter 25 mm, Thickness 10 mm.

8516

Ring magnet 8517
Outer diameter: 25 mm.
Inner diameter: 10 mm; thickness 8 mm.

8517

Magnetic needle 5174
Magnetic needle with protractor.
Mounted on rod 100 mm and base.
Needle length: 60 mm.

5174

Rotating stand for magnets 5250
It consists of a stand ,rotating on a point, so to highlight the actions between magnetic poles.

5250

Set of 10 magnetic needles 5296

Needle length 30 mm; the neddles allow you to draw the flux lines of a magnetic field.

5296

Set of 10 magnetic in-box needles 5358

Diameter 20 mm, height 8 mm.

5358

Set of 12 compasses 5359

Diameter 25 mm, height 6 mm.

5359

Apparatus to show the magnetic spectrum 5027

Equipment supplied

1 "U"shaped magnet
1 Circular base
1 Plexiglas plate
1 Iron filings bottle

5027

Magnetic forces apparatus 5125

This item lets you visualise the remote action of magnetic forces.
With two ring magnets.

5125

Magnetoscopes 5293

Part 1

It is composed of a transparent cube (80 x 80 x 80 mm) containing a silicon oil solution with iron filings in suspension into it. Inserting the supplied linear magnet in the central hole, the wire-like iron particles line up to the space flux-lines of the field generated by the linear magnet.

Part 2

It is based on the same principle of the previous apparatus; it enables a bidimensional representation of the flux lines both of a linear and "U"-shaped magnet, both supplied as apparatus'equipment. Dimensions 120 x 60 mm.

5293

Magnetism kit 5414

The item can show, in an elementary way, the properties of magnets. It can also discover which substances are not subject to magnetic force.

5414

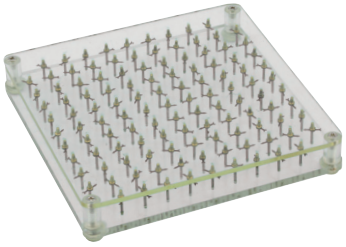
Magnetoscope 5405

98 iron bars protected by a housing are free to be arranged randomly.
Under the action of an external magnetic field, for example by inserting the magnet model into the extensible solenoid, code 5178, the bars align like the magnetic moments of the molecules of ferromagnetic bodies. It can be used to display the force lines of the magnetic field.
With magnets code 5024 or code 5286. Dimensions 75x150 mm.

5405

Magnetoscope with needles 5420

As in 5405, 117 small iron bars, protected by a case, are free to move randomly.
Dimensions: 150x150 mm.



5420

"Play and learn" kit 5541

You can learn the properties of magnetic bodies enjoying yourself.

Equipment supplied

1 Magnetic spade	50 Magnetic clips
1 Horseshoe magnet	24 Coloured magnetic tokens
10 Magnetic balls	1 Magnets stand

5541

Set of accessories for experiments on magnetism 5322

Topics

- The magnet
- Two magnetic poles
- The compass
- Magnetic forces
- Magnetic induction
- The magnetic spectrum

Equipment supplied

2 Magnetic needles
2 Linear alloy-made magnets
1 "U"-shaped steel magnet with stand
1 Plexiglas plate
1 Rotating stand
1 Iron filings bottle
1 Compass
1 Case

5322

Precision compass 5231

Diameter: 100 mm.
With wind rose.

5231

Big didactic compass 5135

Thanks to its dimensions it can be seen from far away. Diameter: 200 mm.

5135

Simple compass 18/E

Diameter: 45 mm.

18/E

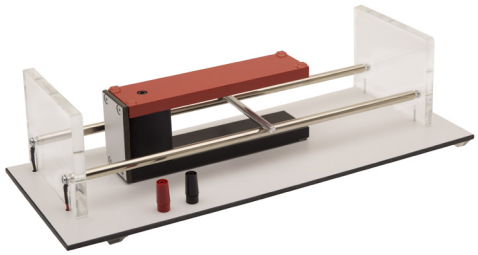
Walk compass 5171

Liquid pocket compass Ø 45mm with cover, ring and indicator. Plastic body.

5171

Apparatus for the verification of Lorentz force 5177

It consists of two metal tracks where a cylindrical aluminium bar can roll while positioned in order to be immersed in the field of a permanent magnet. Allowing the current to flow in the aluminium bar through the use of generator code 5248, the bar is given a force whose direction is determined through the "the left hand" rule.
Track length: 45x17 cm.



5177

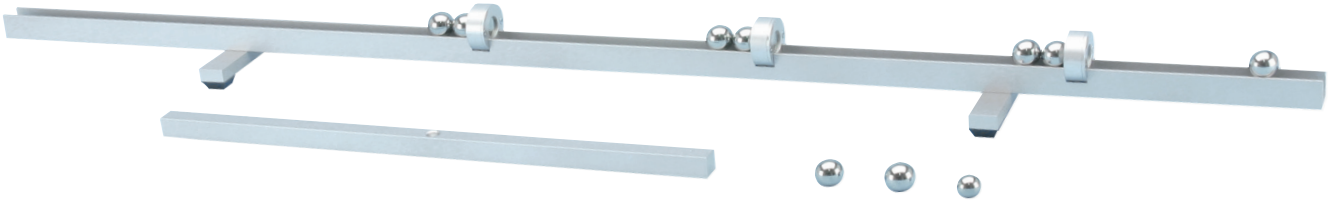
1 Stage magnetic gun (Gauss gun) 5369

The magnetic field of a permanent magnet decreases quickly as distance increases. The sphere in the charger, is located in the field of a powerful neodymium magnet; therefore it is abstracted by a force which increases quickly as the sphere's distance from the magnet decreases.
Once delivered, its potential energy turns into kinetic energy.
Two 1 stage guns may be connected in series to create a 2 stage gun.
Gun length: 40 cm.

5369

3 Stage magnetic gun 5370

The magnetic gun is a mechanical model that allows you to explore in a simple and intuitive way, without any calculation, concepts such as energy configuration, exothermic systems and reversible reactions.
It is also a very useful exercise to understand mechanical systems using energy balances and symmetries rather than analytical or mathematical details.
Supplied with 3 magnets, 2pcs Ø 16 mm spheres and 8pcs Ø 20 mm spheres.
Track length: 100 cm.



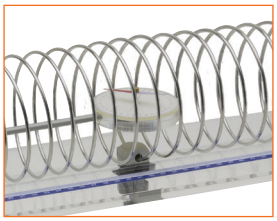
5370

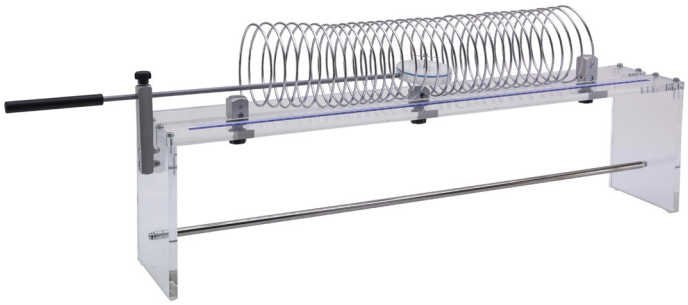
Extensible solenoid 5178

This item allows the study of the magnetic field generated by a solenoid, because it is possible to vary the coil number per length measurement unit. Once the magnetic needle has been positioned toward the earth field and the solenoid has been positioned in a perpendicular direction, the tangent of the needle's deviation angle is proportional to the intensity of the magnetic field and, therefore, to the intensity of the electric current and to the number of coils per length measurement unit.
To be used with generator code 5360. Dimensions: 63x15x20 cm.
It is possible to study the dependence of the magnetic field by the number of turns per meter using a magnetic field sensor.

Equipment for online use - not supplied

1 Sensor holder	code 5399
1 Magnetic field sensor	code 9091
1 Current sensor	code 9027
1 Interface	code 9001
or	
1 USB magnetic field sensor	code 9067
1 USB current sensor	code 9073





Suitable to be used with sensors

5178

Electromagnetic scale 5179

The electromagnetic scale has a solid and elegant plexiglass structure. One of the two arms ends with a rectangular aluminium coil immersed in the field of a powerful permanent magnet. The other arm has two sliding masses, which allow the item to obtain equilibrium at rest. Allowing the current to flow through the use of apparatus code 5361, a force F appears between the magnetic field B and the electric current i, whose value is given by the Ampere law:

$F = B \cdot l \cdot i \cdot \text{sen } \alpha$

where l is the length of the conductor and α is the angle created between the conductor and the magnetic field. It is possible therefore to verify that the intensity of the force reaches its maximum when α=90° and it is zero when α=0°. Using the power supply, the value i of the electric current can be read with an ammeter and, therefore, it is possible to deduce the permanent magnet's induction value B. The experiment can be repeated replacing the permanent magnet with the solenoid. In this way it is possible to verify the ratio which gives the value of the magnetic field inside a solenoid. Scale sensibility: 10 mg. Dimensions: 58x18x17cm.

Equipment supplied

1 Electromagnetic scale
1 Permanent magnet
1 Solenoid
1 Weight box 200 g with gram fractions

5179

Electromagnetic actions kit 5184

With this apparatus it is possible to experiment on currents-magnets and currents-currents interactions. Recommended power supply code 5360 not provided.

Equipment supplied

1 Frame
2 Electrical leads 60cm
1 Rectangular reel
1 "U"conductor
2 Crocodile clips
1 Linear magnet
1 Magnetic needle
1 "U"shaped magnet
1 Set magnetic needle

5184

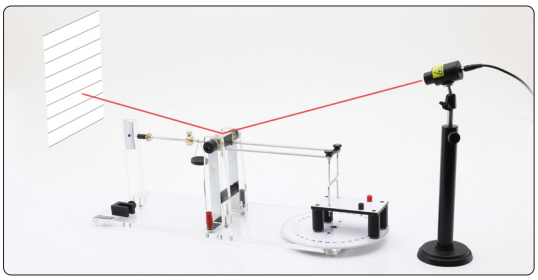
Accessories for electromagnetic scales

Set of accessories for 5179 5458

Thanks to this set it is possible to deepen the Ampère principle and the Ørsted experiment.

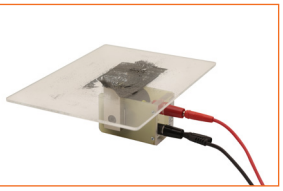
Laser for optical lever 5459

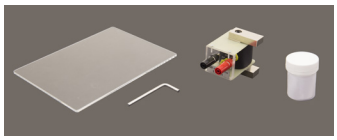
Thanks to the optical lever, every small angle variation is amplified for easier measurement.



Apparatus to show the field of an electromagnet 5356

It consists of a plastic material plate and an electromagnet (composed of an inductor and a metal nucleus) which must be placed under the plate. The item is supplied with a bottle of iron filings and an allen screw to assemble the electromagnet.
Maximum voltage: 6V.





5356

Coil 400 turns, 0,69 A 5375

Internal hole for core: 28x28 mm.

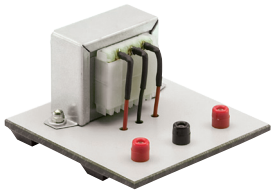
5375

Coil 1600 turns, 1A 5078

Internal hole for core: 20x20 mm.

5078

Inductor 8510

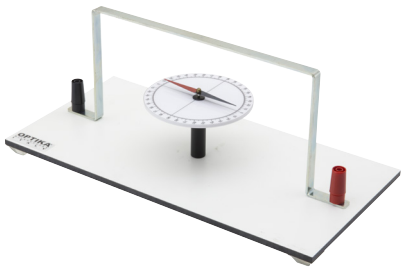


Features in alternating current 1 kHz:
L=0,22 H, R= 56 Ω between two extreme poles;
L= 58 mH, R= 24 Ω between an extremity and the intermediate pole
Features in direct current:
R= 0,6 Ω between two extreme poles, R= 0,3 Ω between an extremity and the intermediate pole.

8510

Linear Ørsted apparatus 5857

The item can show the magnetic effect of electric current flowing in a linear conductor.
Provided with magnetic needle and goniometer that allows you to take measures during the experimentation. To be used with a power supply: 5 A.



5857

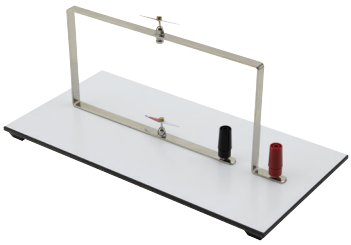
Circular Ørsted apparatus 5858

The item can show the magnetic effect of the electric current flowing in a circular conductor.
Provided with magnetic needle and goniometer.
To be used with a power supply: 5 A.

5858

Ørsted apparatus with two needles 5122

The item can show the magnetic effect of the electric current flowing in a circular conductor through the use of 2 magnetic needles.
To be used with a power supply: 5 A.



5122

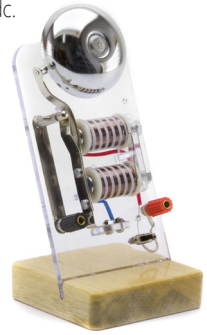
Horseshoe-shaped electromagnet 5274

With anchor and stand.
Voltage: 3 Vdc. Height: 35 cm.

5274

Electric alarm model 5186

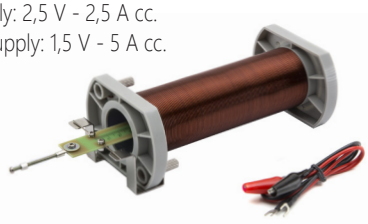
It can show the functioning principle of an electric alarm. Dimensions: 9x9x19 cm.
Voltage: 6 V dc.



5186

Apparatus for the electrodynamic actions 5288

This apparatus consists of a solenoid containing a linear conductor positioned perpendicularly to the flux lines. Being possible to balance the electrodynamic interaction force, it is possible to perform quantitative experiments too.
Dimensions: 200x90x90mm. Internal diameter: 38mm.
Scale power supply: 2,5 V - 2,5 A cc.
Winding power supply: 1,5 V - 5 A cc.



5288

Faraday's experiments kit 5128

With this kit it is possible to perform the fundamental experiments on electromagnetic induction.

Equipment supplied

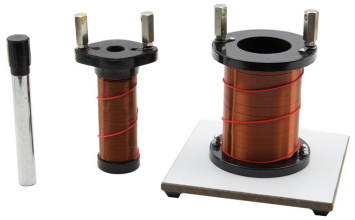
1 Battery	2 Electrical leads 60 cm
1 Switch	3 Electrical leads30 cm
1 Galvanometer	2 Crocodile clips
1 Linear magnet	1 Box
1 Double coil	

5128

5274

Double coil for induced currents 5273

This item enables you to perform the most important experiments of Faraday on electromagnetic induction. The closure or the opening of the primary solenoid , its movement or that of its iron nucleus, produce induced currents in the secondary solenoid; these currents can be highlighted with the galvanometer code 5047.
Primary number of coils: 400. Secondary number of coils: 1150.
Work voltage: 6 - 10 V. Dimensions: 65 x 65 mm.



5273

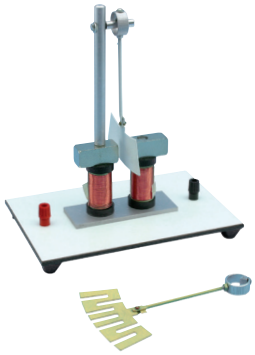
Apparatus for the verification of Lenz's law 5285

This simple apparatus allows the verification of Lenz law in a simple way. If you insert a linear magnet into the non-interrupted ring, the ring is rejected , while it is attracted during the extraction of the magnet; this fact proves that the induced currents' direction is always opposite to the one of what has generated them. The same thing doesn't happen with the interrupted ring.

5285

Waltenhofen pendulum 5120

If you allow two aluminium sectors, one whole and the other cut, to oscillate with the excited magnet, you can see that the oscillation slows down more quickly in the first instance, because of the parasitic currents.



5120

Ruhmkorff's coil 5208

For 50 mm long sparks; power supply :6-12 V dc. It is supplied with automatic switch. A power supply is required (code 4991, not provided).

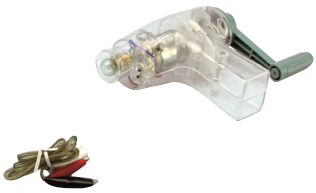
Weight
2.450 Kg
Length
295 mm
Width
180 mm
Height
208 mm

Input voltage
9-12 V, DC
Max current
5 Amp
Maximum sparkle
50 mm

5208

Manually operated dynamo 5393.1

It is contained into a transparent case, in order to let you see how electromagnetic induction can be exploited to produce electric energy. Moreover it is possible to verify the dynamo's principle of reversibility. With double-ended crocodile clips cable.



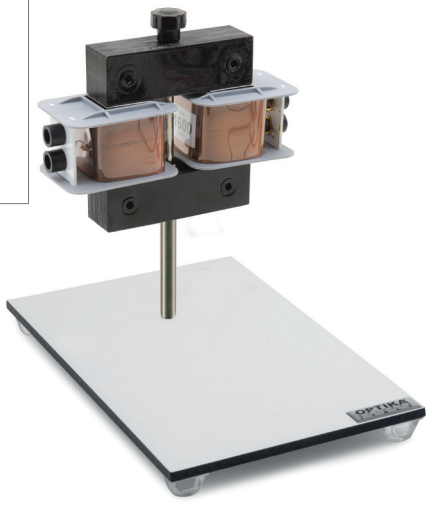
5393.1

Modular transformer 5114

It consists of a nucleus made of laminated ferromagnetic material which can be divided into two parts (one is "U" shaped, the other straight) in order to replace the coils. Max. applied voltage: 6 V ac.

Equipment supplied

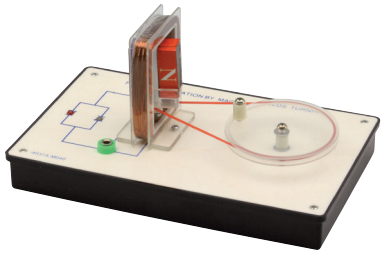
1 base
1 "U"shaped nucleus made of laminated iron
1 Closure yoke
1 Asta di sostegno
1 Coil 1600 turns
1 Candle
1 Aluminum ring with cut
1 Coil 400 turns
1 Coil 50 turns
1 Aluminium ring
1 Melting pot with handle



5114

Alternator-engine model 5419

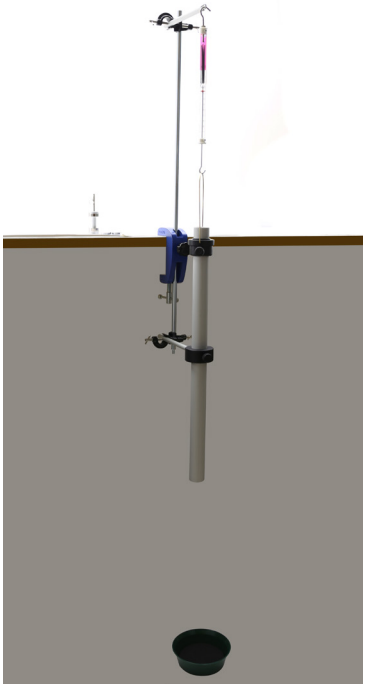
By turning the handle, the magnet rotates inside the coil, inducing an electric current which turns on the LEDs. Dimensions: 205 x 125 x 25 mm.



5419

Apparatus to verify the electromagnetic induction law and the principle of action-reaction 1342

Inside the aluminium tube, a magnet falls with uniform motion. The explanation is the following: during the fall of the magnet, the aluminium tube is linked to a variable magnetic flux and therefore it has induced currents whose directions, according to Lenz's law, are opposite to what has generated them, i.e. the magnet's motion, in this case. The consequence is that the latter , in the beginning phase, falls with uniformly accelerated motion because it's moved by a vertical force whose intensity is equal to the difference between its weight P and the electromagnetic force F. This force is proportional and opposed to the speed of the fall, i.e. it is a viscous force: F = - kv. The moment the magnet reaches the speed v0 so that P - kv0 = 0, its motion becomes uniform.
Thanks to the principle of action and reaction, the magnet reacts on the tube with an equal and opposite force and, therefore, during the fall with uniform motion of the magnet, the spring scale measures a force with an intensity equal to the sum of the tube's and the magnet's weights.



1342

Equipment supplied

1 Table clamp
2 Double bossheads
1 Rod 750 x 10 mm
1 Spring scale 1000 g
1 Kit of magnets
4 10 g masses, diameter 4 mm
1 Aluminium tube with ring-shape support
1 Container to collect the magnets
1 Ring-shape PVC support for tube
1 Support for spring scale

Electromagnetic Fall 5424

A free-falling magnet going through coils produces an induced voltage that lets the LEDs turn on. The production of light energy is obtained at the expense of the kinetic energy of the magnet, which slows down when passing through the coils. If you make a dynamic comparison with an identical magnet, falling down simultaneously along a tube without coils, it can be seen that the latter always comes down first.

5424

Electromagnetic pendulum 8515

Essential item to study electromagnetic interactions. It consists of a linear magnet hanging from a spring and where a spool is located. Starting the magnet's motion, an electromotive force is induced in the spool which is measurable at the resistor's ends. Similarly, making a/c circulate in the spool, the magnet starts its motion.

Topics

- Electromagnetic induction;
- A/c production;
- Electromagnetic resonance.

Equipment required, not supplied

1 Function generator	code 5718

Equipment supplied

1 1600 turns coil fitted with support and plexiglas tube
1 Linear magnet, diam. 10 mm with support
2 Coil spring
1 Magnetic weights-holder
2 Mass 10 g
2 Mass 20 g
2 Electrical leads 120 cm
1 Rectangular base with rod 10x800 mm
2 Boss-head
1 Bar with hook
1 Base with two bonding posts boss-heads
2 Resistors

Equipment for online use - not supplied

1 Interface code 9001
2 Voltage sensor code 9029
2 Current sensor code 9027
1 Magnetic field sensor code 9039
or
2 USB Voltage sensor code 9074
2 USB Current sensor code 9073
1 USB Magnetic field sensor code 9067

Suitable to be used with sensors

8515

Uniform motion trolley 5327

Along the inclined plane made of plastic laminate, the motion of the trolley is uniformly accelerated; along the aluminium inclined plane, the motion is uniform because of the electromagnetic brake previously described.

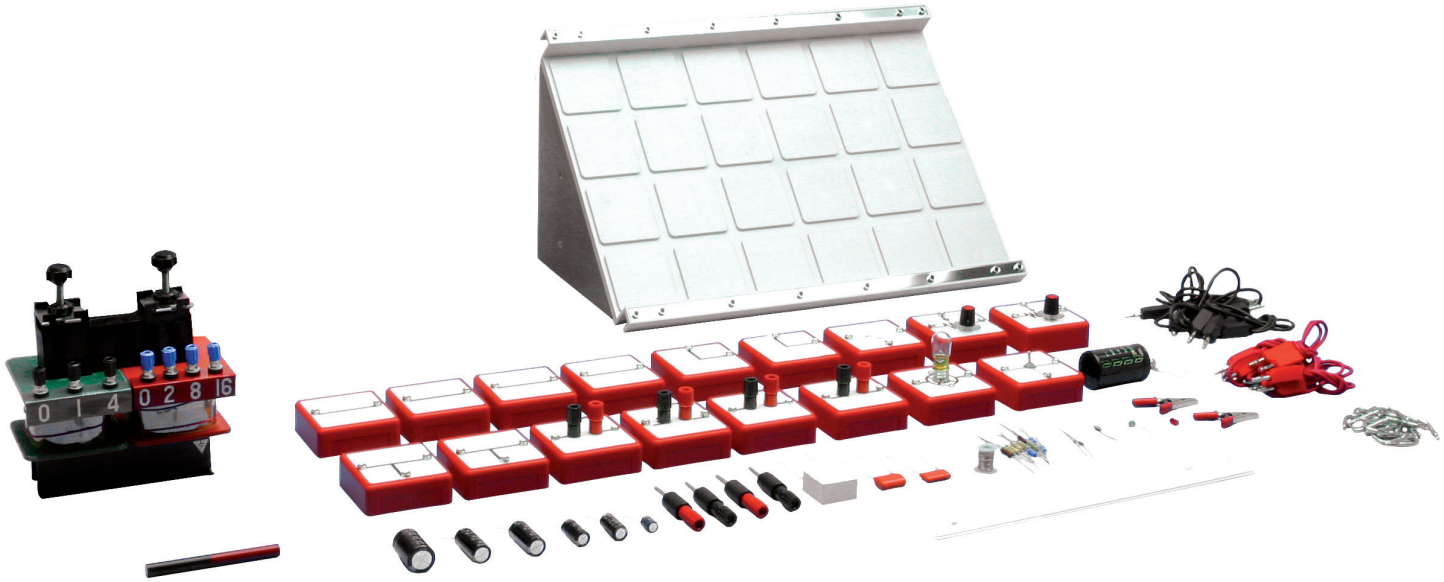
Equipment supplied

1 Aluminium plane 600x80 mm
1 Plastic laminate plane 600x80 mm
1 Wood block 100x50x25 mm
1 Low-friction trolley supplied with one neodymium magnet
4 20 g masses

5327

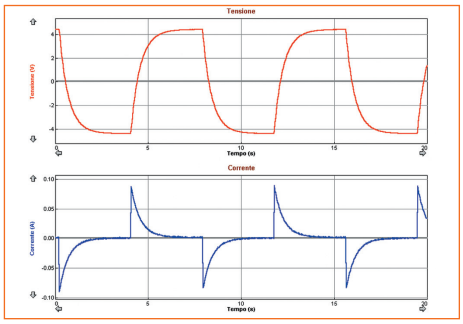
Electromagnetism kit 8514

Laboratory experiments on electrical circuits are difficult due to the use of cables to connect the different parts. It becomes difficult to vary the typology of a circuit without risking incorrect or damaging connections. In addition we risk losing sight of the structure of the circuit. This kit is based on modules which can be quickly assembled on a table. In this way, the type of circuit is immediately recognizable and replacing a part or changing the circuit become simple and quick.



Topics

- Ohm' Laws
- Adjustment in series/parallel
- Charging and discharging of the condenser
- Autoinduction
- The reactive components in a/c
- Magnetic field in a solenoid
- Electromagnetic induction
- Tranformer
- Oscillator circuits
- Resonance
- Rectifier circuit



Charge and discharge of a capacitor

To perform the experiment "the magnetic field in a solenoid" is recommended the product code 5178 "Extensible solenoid".

Equipment supplied

1 Assembling table	2 "T" conductors	1 Kantal wire	1 Modular transformer
14 U bolts	4 Linear conductors	2 Crocodile clips	1 Linear ruler
1 Set of 10 resistors	2 "L" conductors	1 Potentiometer, 22 Ω	1 Set of spring hook for magnet
1 Set of 4 non linear dipoles	1 Switch	1 Bulb holder	1 pdf teaching guide
1 Set of 10 Capacitors	4 Universal connectors	1 Bulb	4 Extensions to crocodile clips
10 Electrical leads	4 Insulators	1 Bar magnet	

Equipment required - not supplied

1 Generator of low frequency signals	code 5718
1 Power unit 0-5A	code 5248

Equipment for online use - not supplied

1 Interface code 9001
1 Magnetic field sensor code 9039
2 Voltage sensor code 9029
2 Current sensor code 9027
or
1 USB magnetic field sensor code 9067
2 USB voltage sensor code 9074
2 USB current sensor code 9073

Suitable to be used with sensors