



# magnetostatics & electricity experiments - "inno system"



## MAGNETOSTATICS

DE715-0SE Experiment manual "Magnetostatics", b/w booklet  
DE715-0CE Experiment manual "Magnetostatics", CD-ROM

- MAI 001 Magnet as a compass
- MAI 002 Poles of a magnet
- MAI 003 Magnetic and non-magnetic substances
- MAI 004 Shielding a magnetic field
- MAI 005 Attraction and repulsion (mutual effects) between magnets
- MAI 006 A natural magnet
- MAI 007 Magnetic force
- MAI 008 Mutual effect of magnets and iron on each other
- MAI 009 Molecular magnets - making a permanent magnet
- MAI 010 Dividing a permanent magnet
- MAI 011 Demagnetizing a permanent magnet
- MAI 012 Magnetic fields - field line patterns
- MAI 013 Magnetic field of a bar magnet
- MAI 014 Representing a magnetic field- magnetic field model
- MAI 015 Magnetic influence with iron and steel
- MAI 016 Effect of a magnetic field on two iron rods hanging beside each other
- MAI 017 The earth's magnetic field - magnetic declination and inclination
- MAI 018 Ferro-, para- and diamagnetism

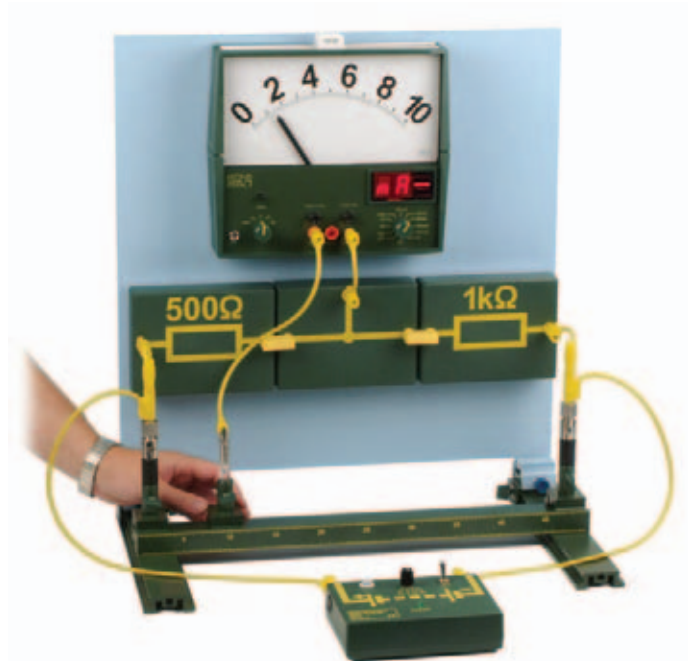


## ELECTRICITY 1

DE715-1SE Experiment manual "Electricity 1", b/w booklet  
DE715-1CE Experiment manual "Electricity 1", CD-ROM

### Basic circuits, conductors and non-conductors

- ELI 001 Electrical circuits
- ELI 002 Double-throw switches
- ELI 003 Two-way circuits
- ELI 004 Conductors and non-conductors - solids
- ELI 005 Voltage
- ELI 006 Voltage sources in series circuits
- ELI 007 Voltage sources in parallel circuits
- ELI 008 Terminal voltage
- ELI 009 Voltage drop across a light bulb
- ELI 010 Amperage
- ELI 012 Voltage sources in parallel circuits - short-circuit current
- ELI 013 Voltage sources in series circuits - amperage measurement
- ELI 014 Voltage sources in parallel circuits - amperage measurement
- ELI 015 Conductors and non-conductors - liquids
- ELI 016 Conductivity of gases
- ELI 017 The human body as an electrical conductor
- ELI 018 The human body in contact with water as an electrical conductor
- ELI 019 Closing a circuit by grounding - electrical resistance
- ELI 020 Ohm's law
- ELI 021 Application of Ohm's law
- ELI 022 Measuring resistance with an ohmmeter
- ELI 023 Resistance of wires
- ELI 024 Specific resistance of wires
- ELI 025 Iron wire is not an ohmic resistor
- ELI 026 Iron wire is a PTC conductor
- ELI 027 A light bulb is a PTC conductor
- ELI 028 Ohmic resistors in series circuits



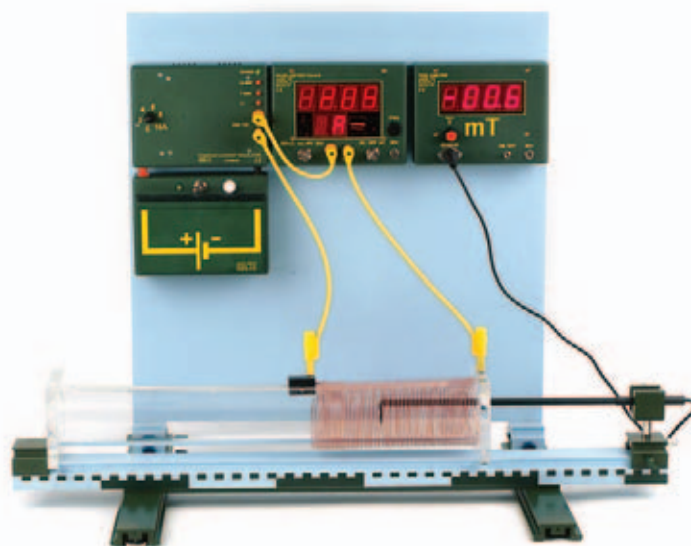
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- ELI 029 Ohmic resistors in parallel circuits
- ELI 030 Resistors in mixed circuits
- ELI 031 Voltage divider
- ELI 032 Variable resistor
- ELI 033 Model of a potentiometer
- ELI 034 Sliding resistor as a variable barrier resistor
- ELI 035 Sliding resistor as a variable voltage divider
- ELI 036 Regulating lighting using a potentiometer
- ELI 037 Model of a fader
- ELI 038 Potentiometer not under load
- ELI 039 Potentiometer under load
- ELI 040 Light bulbs in parallel circuits (loads)
- ELI 041 Light bulbs in series circuits
- ELI 042 Internal resistance of a voltmeter
- ELI 043 Internal resistance of an ammeter
- ELI 044 Internal resistance of a voltage source
- ELI 045 Expanding the measuring range of a voltmeter
- ELI 046 Expanding the measuring range of an ammeter
- ELI 047 Wheatstone bridge circuit

## Thermal effects of electrical current - heat energy from electrical energy

- ELI 048 Converting electrical energy into heat energy
- ELI 049 Heat build-up with various thicknesses of wires
- ELI 050 Short circuits are a fire hazard
- ELI 051 Fuses prevent fire hazards
- ELI 052 The incandescent effect of a filament
- ELI 053 Overloading causes fire hazards - fuses
- ELI 054 Model of a hot-wire instrument
- ELI 055 Model of a bi-metallic fuse
- ELI 056 Bi-metallic thermostat
- ELI 057 Model of a bimetallic fire alarm
- ELI 058 Principle of the thermocouple element



## Work and power

- ELI 060 Power of an electric motor
- ELI 061 Model of an immersion heater (electricity at work)
- ELI 062 Heat radiation and amperage
- ELI 063 Thermal equivalent of electricity
- ELI 064 Water equivalent
- ELI 065 Mechanical work and power of electrical current

## Chemical effects of electrical current - electrochemistry

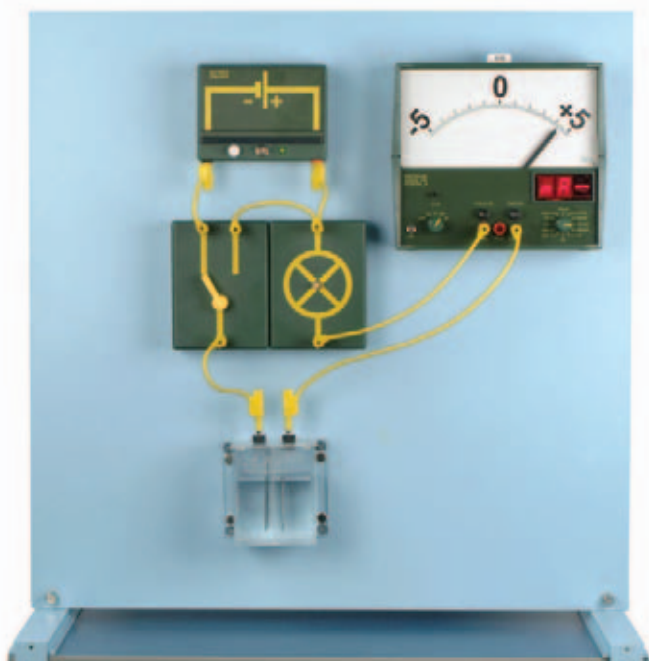
- ELI 066 An electrochemical cell
- ELI 067 Voltaic cell
- ELI 068 Electrolysis
- ELI 069 Galvanizing
- ELI 070 Lead battery
- ELI 071 An electrolytic rectifier
- ELI 072 Voltage experiment series

## ELECTRICITY 2

- DE715-2SE Experiment manual "Electricity 2", b/w booklet
- DE715-2CE Experiment manual "Electricity 2", CD-ROM

## Magnetic effect of electrical current - electromagnetism

- ELI 073 Creating a magnet with the aid of electrical current
- ELI 074 Oersted's experiment (electrical current creates a magnetic field)
- ELI 075 Magnetic field line patterns
- ELI 076 Force caused by a flexible current-carrying conductor within the inhomogeneous magnetic field of a bar magnet
- ELI 077 Magnetic field of a current-carrying coil
- ELI 078 Determining the poles of a current-carrying coil using a permanent magnet
- ELI 079 Magnetic force of a current-carrying coil
- ELI 080 Effect of the magnetic force of a current-carrying coil





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- ELI 081 Mutual effect of a permanent magnet and an electromagnet on each other
- ELI 082 Magnetic force of a current-carrying coil depends on amperage
- ELI 083 Magnetic force of a current-carrying coil depends on number of turns
- ELI 084 Measuring the magnetic field of a current-carrying coil
- ELI 085 Measuring the magnetic field of a current-carrying coil as a function of amperage
- ELI 086 Measuring the magnetic field of a current-carrying coil as a function of the number of turns
- ELI 087 Measuring the magnetic field of a current-carrying coil as a function of the coil's length
- ELI 088 The principle of the electromagnet
- ELI 089 An electromagnetic force apparatus
- ELI 090 Model of a hoisting magnet
- ELI 091 Opening and closing a circuit with the aid of a bar magnet
- ELI 092 The Reed relay

## Uses of electromagnetism

- ELI 093 Model of a relay with break contact
- ELI 094 Model of a relay with make contact
- ELI 095 Model of a relay with break and make contact
- ELI 096 Wagner's hammer
- ELI 097 AC buzzer
- ELI 098 Electric bell
- ELI 099 Model of a magnetic fuse

## Kinetic energy from electrical energy

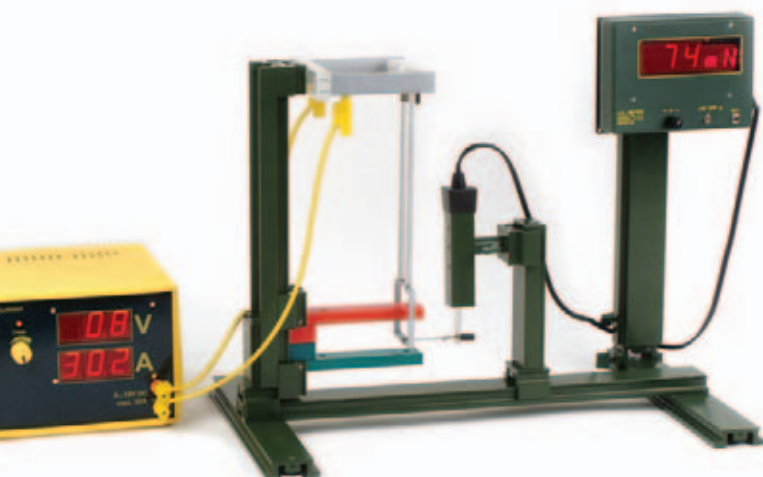
- ELI 100 Force on a current-carrying conductor in a magnetic field - conductor swing
- ELI 101 Lorentz force - a catapult
- ELI 102 Force on a straight, current-carrying conductor parallel to a magnetic field
- ELI 103 Testing for Lorentz force in a metal disc rotating in a magnetic field
- ELI 104 A current-carrying coil in a magnetic field - moving coil
- ELI 105 Principle of a moving-iron instrument



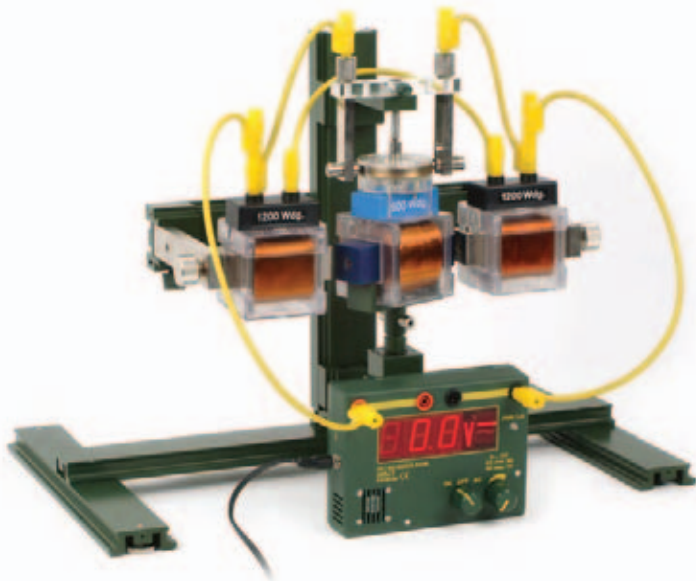
- ELI 106 Model of a moving-iron instrument
- ELI 107 Model of a simple soft-iron instrument
- ELI 108 Model of a galvanometer
- ELI 109 Forces between parallel current-carrying conductors
- ELI 110 Forces between current-carrying coils
- ELI 111 Definition of an ampere
- ELI 112 Current balance - qualitative view
- ELI 113 Current balance - quantitative view
- ELI 114 Principle of an electric motor
- ELI 115 How slip rings work
- ELI 116 How commutators work
- ELI 117 Simple electromotor with two-pole rotor
- ELI 118 Simple electromotor with drum armature
- ELI 119 Series-wound electric motor
- ELI 120 Shunt-wound electric motor

## Electroacoustics

- ELI 121 Model of a carbon granule microphone
- ELI 122 Model of a telephone
- ELI 123 Model of an electromagnetic loudspeaker
- ELI 124 How an electrodynamic loudspeaker works - sound generation
- ELI 125 How an electrodynamic microphone works
- ELI 126 Telecommunication
- ELI 127 Wireless telecommunication - electromagnetic waves



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## ELECTRICITY 3

DE715-3SE Experiment manual "Electricity 3", b/w booklet  
DE715-3CE Experiment manual "Electricity 3", CD-ROM

### Electromagnetic induction

- ELI 128 Induced voltage in conductor loops
- ELI 129 Creation of induced voltage in a coil
- ELI 130 Interaction of a fixed coil and a moving magnet as well as a fixed magnet and a moving coil
- ELI 131 Dependence of induced voltage on the number of turns of a coil
- ELI 132 Dependence of induced voltage on the velocity of movement
- ELI 133 Dependence of induced voltage on the force of a magnetic field
- ELI 134 Induced voltage and shunting
- ELI 135 Energy transfer and induction
- ELI 136 Shielding by means of a short-circuit coil
- ELI 137 Voltage is not always induced
- ELI 138 Induced voltage and effective coil surface area
- ELI 139 Demonstrating the earth's magnetic field by induction
- ELI 140 Dependence of induced voltage on the velocity with which a magnetic field changes
- ELI 141 Independence of induced voltage on the coil's surface area
- ELI 142 Dependence of induced voltage on the number of turns
- ELI 143 Lenz's law
- ELI 144 Lenz's law applied
- ELI 145 Stopping movement by means of induced current
- ELI 146 Induction and movement
- ELI 147 Eddy currents
- ELI 148 Eddy current (Waltenhof) pendulum
- ELI 149 Eddy current brake
- ELI 150 Arago's experiment
- ELI 151 Creating a rotating field - shaded-pole effect
- ELI 152 Reversing a rotating field
- ELI 153 AC electricity meter
- ELI 154 Heating by means of eddy currents
- ELI 155 Electromagnetic induction - periodic changes in the magnetic field
- ELI 156 Interaction of a rotating magnet and a rotating coil
- ELI 157 Revolving field generator with a permanent magnet rotor
- ELI 158 Bicycle dynamo
- ELI 159 Speedometer - model of a bicycle tachometer
- ELI 160 Simple AC generator
- ELI 161 Revolving armature generator with a permanent magnet as stator
- ELI 162 Revolving armature generator with an electromagnetic stator
- ELI 163 Revolving field generator with an electromagnetic rotor
- ELI 164 DC motor with two-pole rotor
- ELI 165 DC generator under load
- ELI 166 DC generator with drum armature
- ELI 167 DC generator with an electromagnetic stator
- ELI 168 Self-exciting AC generator
- ELI 169 DC motor drives a DC generator - DC generator powers a DC motor
- ELI 170 A coil under DC voltage
- ELI 171 Self-induction when switching on direct current
- ELI 172 Turn-off surges caused by self-induction
- ELI 173 Opening and closing current
- ELI 174 Braking effect due to self-induction
- ELI 175 A coil under AC voltage
- ELI 176 AC resistance of a coil
- ELI 177 How a transformer works
- ELI 178 Voltage transformation in a non-loaded transformer
- ELI 179 Voltage transformation in a loaded transformer
- ELI 180 Primary amperage in a non-loaded and loaded transformer
- ELI 181 Amperage is also transformed
- ELI 182 Transformer with aluminium ring
- ELI 183 Transformer with solid iron core (heat build-up - voltage drop)
- ELI 184 Horn-shaped lightning arrester
- ELI 185 Model of an arc lamp
- ELI 186 Melting nails
- ELI 187 Arc welding
- ELI 188 Model of an induction smelting furnace
- ELI 189 Magnetic (Thomson) cannon
- ELI 190 High-voltage transmission lines
- ELI 191 Model of a fault-current cut-out

### Conversion of energy

- ELI 192 Generator - work and power
- ELI 193 Motor drives a generator - generator powers a motor
- ELI 194 Converting mechanical energy into electrical energy - doing work by lifting a weight
- ELI 195 Converting mechanical energy into thermal energy
- ELI 196 Converting electrical energy into mechanical energy