"Sarl DEVTECH DIDACTICS"
Djillali Liabes University of Sidi-Bel-Abbes
MANUFACTURE OF DIDACTIC AND SCIENTIFIC EQUIPMENT

DIDACTIC AND SCIENTIFIC MATERIAL FOR HIGHER EDUCATION

MANUFACTURE OF DIDACTIC AND SCIENTIFIC EQUIPMENT

The "DEVTECH DIDACTICS", the subsidiary company of the Djillali Liabes University of Sidi-Bel-Abbes is launching the production of didactic materials.

Our products, which are manufactured in Algeria with Algerian know-how, are intended for higher education, national education and vocational training. Our major arguments are the after-sales service provided by our engineers and a training based on the national program.

Please find attached the catalogue of the first products manufactured by Devtech Didactics. We remain fully available and attentive to your needs.

Devtech Didactics

"DEVTECH DIDACTICS"
Manufacture of didactic and scientific materials
Creation Decree No.14 of 15 February 2023

CATALOGUE

Variable AC/DC Power Supply

Adjustable from 0-230V DC or AC, this power supply provides a permanent 6 to 10A current, depending on demand. It is protected by a magneto-thermal circuit breaker.

• Power inlet:	By single-phase cord
• M/A control	Magnetothermal circuit breaker
• Variable DC voltage	240 volt
• Variable alternating voltage	230 volts.
• Voltage setting mode	By rotary knob on top
• Max DC or AC current	6 to 10A
• Output visualization	1 voltmeter and 1 ammeter
• Upstream protection	Thermal-magnetic circuit breaker
• DC output protection	Thermal-magnetic circuit breaker
• Filtering	Per Capacitor
• Switching	DC – 0 – AC per rotary
• Outlet connection	Safety bollards
• Dimensions / Weight	230 x 290 x 333mm / 17kg

SUITABLE FOR 1000W MACHINES

AC Power Supply

Adjustable from 0-230V AC, this power supply provides a permanent 6-10A current. It is protected by a magneto-thermal circuit breaker.

- Power inlet: By single-phase cord
- M/A control luminous switch
- Variable alternating voltage 230 volts.
- Voltage setting mode By rotary knob on top
- Max alternating current 6 to 10A
- Output visualization Voltmeter and digital ammeter
- Upstream protection Thermal-magnetic circuit breaker
- DC output protection Thermal-magnetic circuit breaker
- Outlet connection Safety bollards
- Dimensions / Weight 161 x 300 x 300mm / 13kg

SUITABLE FOR 1000W MACHINES

Variable Three-phase Power Supply

Adjustable from 0-450V AC, this power supply provides a permanent 6A current. It is protected by a magneto-thermal circuit breaker.

• Power inlet:	By three-phase cord
• M/A control	luminous switch
• Variable alternating voltage	0-450 Volts
• Voltage setting mode	By rotary knob on top
• Max alternating current	8A
• Power	6.235 kVA
• Output visualization	Digital Measuring Unit
• Upstream protection	Thermal-magnetic circuit breaker
• DC output protection	Thermal-magnetic circuit breaker
• Outlet connection	Safety bollards
• Dimensions / Weight	650 x 280 x 340 mm/ 43 kg

Adjustable High Voltage DC Power Supply 0-30 kV

This power supply provides an adjustable high voltage from 0 to 30 kV with an output current of 5 mA, It is equipped with a display for voltage measurement and a display for current measurement,

• Power inlet:	By single-phase cord
• M/A control	luminous switch
• Variable DC voltage	0-30 kilovolts
• Voltage setting mode	Rotary knob
• Max. current	5 mA
• Output visualization	Voltmeter and digital ammeter
• Protection	By fuse
• Outlet connection	HV cable
• Dimensions / Weight	400x300x250/13kg

High Voltage Training Set

Features include:

- A HV power supply of positive polarity 30 kV, 5 mA

- A HV power supply of negative polarity 30 kV, 5 mA

- A cell for fixing different types of electrodes (sphere, tip, plane) with the possibility of varying the inter-electrode interval

- A resistive divider with the ability to use multiple divider ratios, available in two models: with or without direct high voltage measurement voltmeter.


Breakdown and corona test cell

Adjustable resistor for use in a resistive divider circuit

Electrical Wiring Bench

Electrical wiring bench
### Optional: PLC (Programmable Logic Controller)

This type of larger format model is intended for students of electrical engineering and automation. It offers a dozen manipulations to learn the wiring of the different circuits of the lighting and the starting of the motors. In addition, the student will be able to learn the basic use of the programmable logic controller.
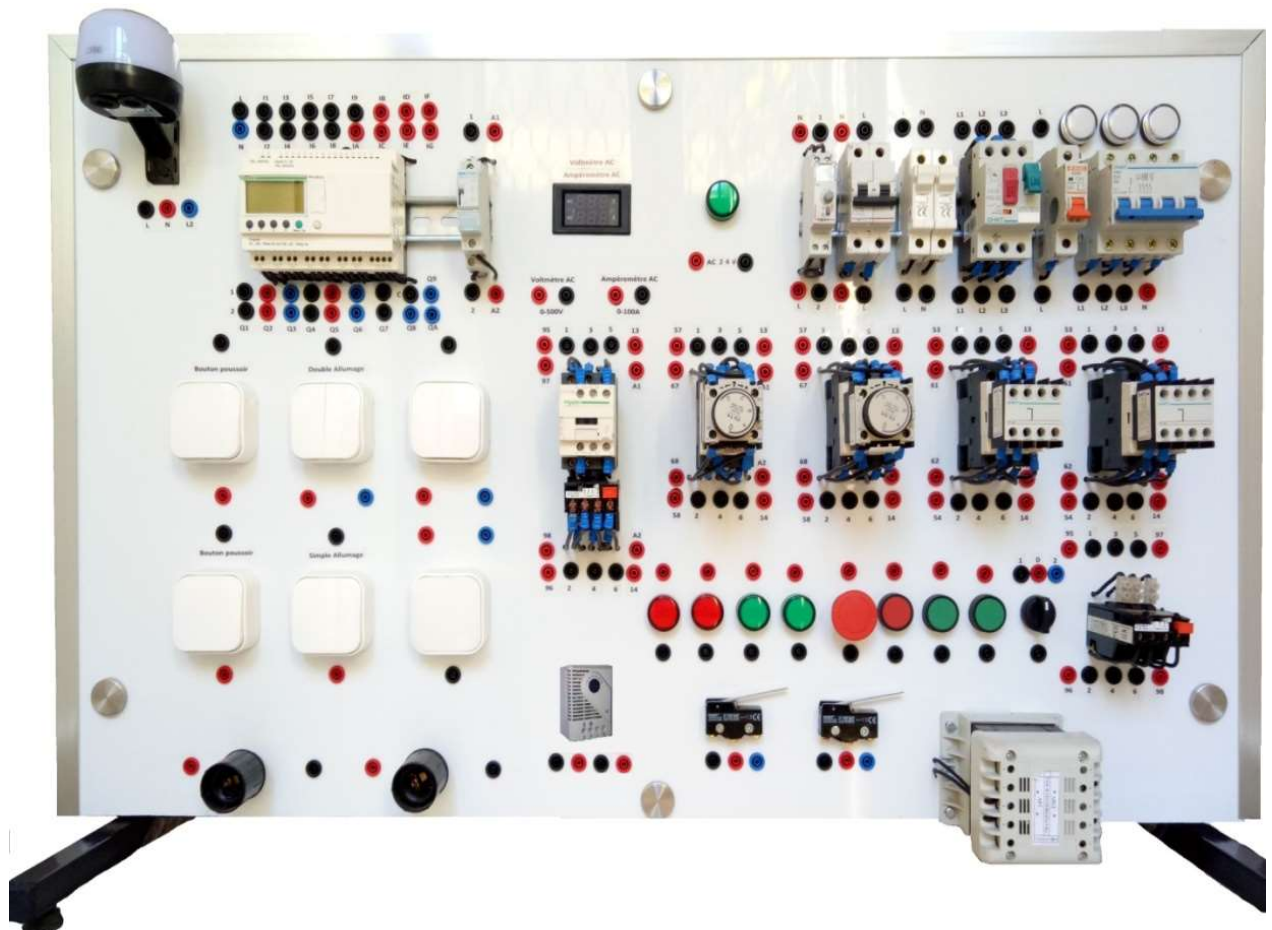
Voltage, Current and Power Measurement

This model allows the student to learn the fundamental laws of measuring alternating voltage, current and power. It is equipped with a variable 0-24 V three-phase power supply that also supplies single-phase circuits. It includes a digital voltmeter and ammeter, as well as a set of R, L and C loads, allowing the student to make the circuits themselves. An optional power meter can be acquired for power measurement.

|	
• Power inlet:	By single-phase cord
• M/A control	luminous switch
• Power voltage	230 Volts
• Output voltage	0-24V "Single-phase/Three-phase" AC
• Output visualization	Voltmeter, Ammeter
• Upstream protection	By fuse
• Outlet connection	Safety bollards
• Dimensions / Weight	500 x 300 x 40mm / 6kg
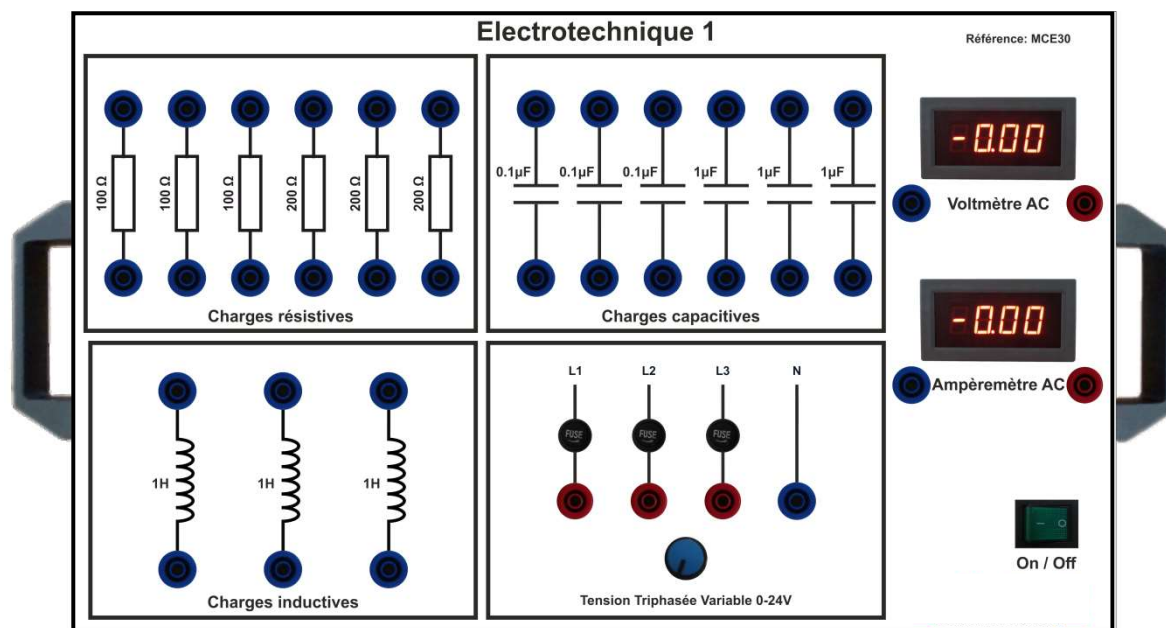
The model makes it possible to carry out the following manipulations:

- Measurement of voltages and currents in single phase
- Measurement of voltages and currents in three phase
- Three-phase active and reactive power measurement

Electronics Simulator

This model allows the student to have at his disposal a set that allows him to do different types of tests in electronics. It is equipped with 4 fixed DC voltage supplies +12V, -12V, +5V and -5V as well as a variable voltage of 15V...+/- 15V It also includes test plates, a digital voltmeter, a set of resistors and a potentiometer.

|	
• Power inlet:	By single-phase cord
• M/A control	luminous switch
• Power voltage	230 Volts
• Output voltage	+12V, -12V and +5V, -5V and 1 variable voltage -15V...+/- 15V Digital Voltmeter
• Output visualization	
• Upstream protection	By fuse
• Outlet connection	Safety bollards
• Dimensions / Weight	500 x 300 x 40mm / 4kg
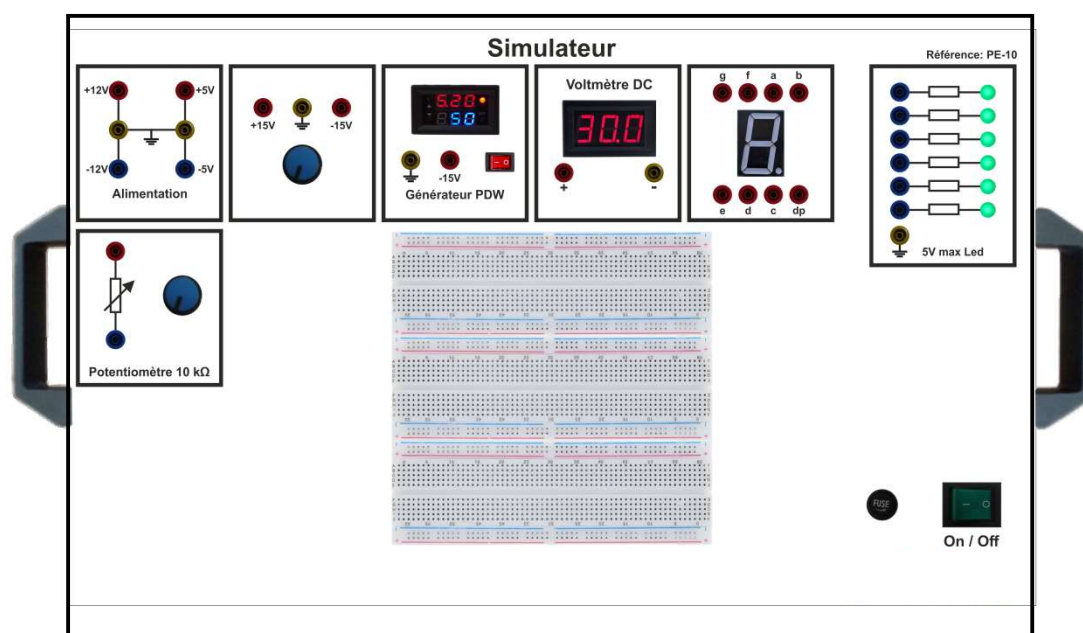
The bench makes it possible to make different types of circuits with two available test plates that can be fed directly from the bench.

Power Electronics
Single-phase Rectification

This model allows students to practice the basics of single-phase uncontrolled (diodes) and controlled (thyristors) rectification with ease.

- Mains input   via single-phase cord
- M/A control   By light switch
- 230 Volt supply   voltage
- Output voltage   15V mid-point transformer
- Angle variation α   Per potentiometer
- Upstream protection   By fuse
- Connection of the output   to safety terminals
- Dimensions / Weight   500 x 300 x 40mm / 5kg
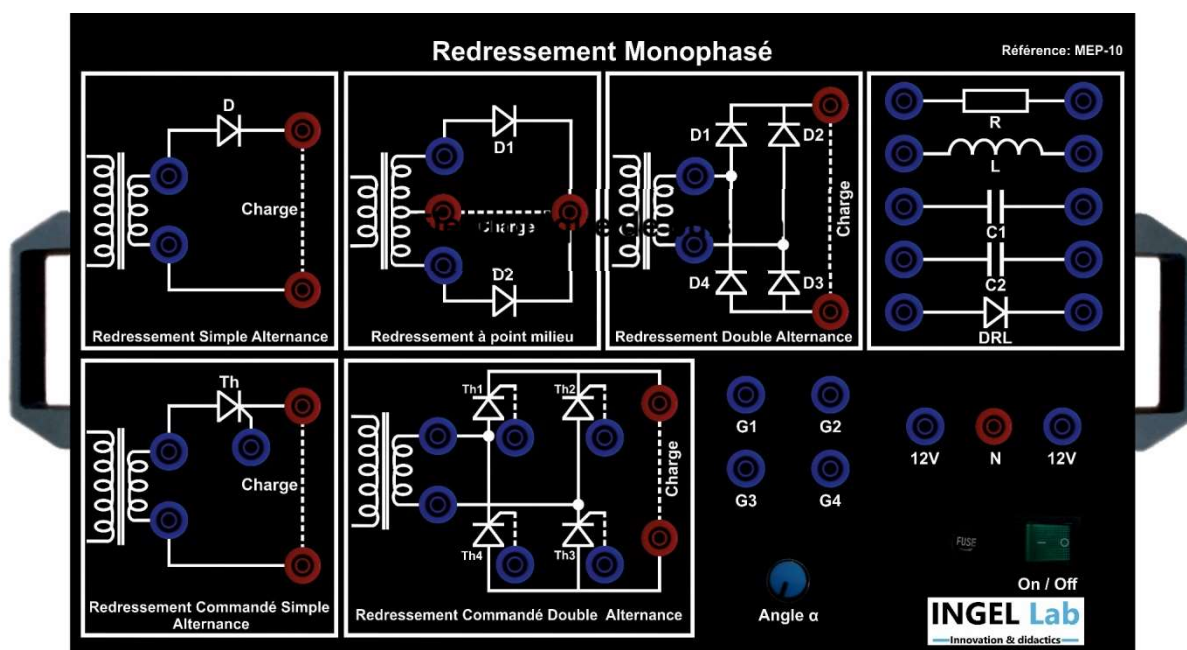
The model is powered by a 15V midpoint transformer and allows the following educational operations:

- Single-phase diode rectification: single halfwave, double halfwave with Graetz bridge and midpoint.

- Single-phase rectification with thyristors: single halfwave, double halfwave.

- Filtering: possibility to use up to 3 values of the filtering capacity

- Rectification on R-L load, with and without freewheeling diode

Power Electronics
Three-phase Rectification

This model allows students to practice the basics of uncontrolled three-phase rectification (diodes) and controlled three-phase rectification (thyristors) with ease.

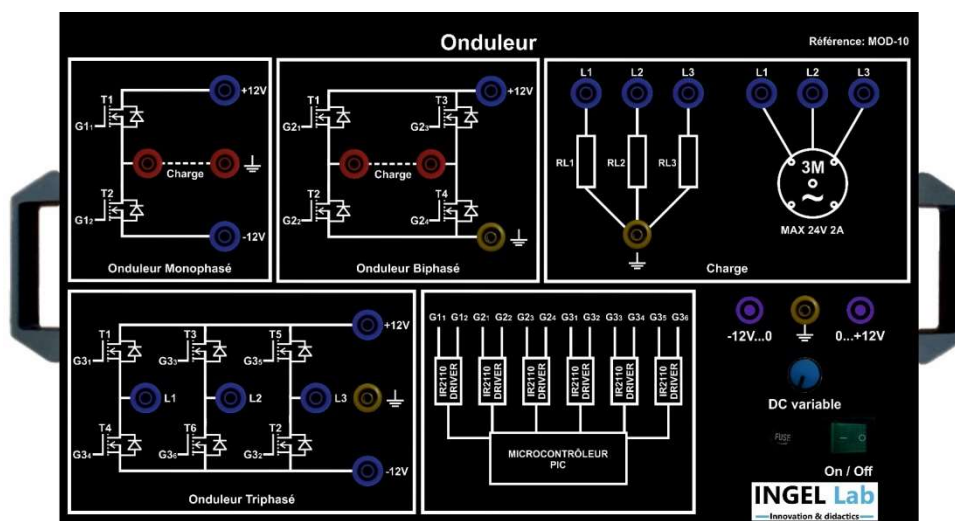|	
• Mains input	via single-phase cord
• M/A control	By light switch
• 230 Volt supply	voltage
• Output voltage	Three-phase power supply V=9V ±0.5v
• Angle variation α	by potentiometer
• α-angle Display	With LCD
• Upstream protection	By fuse
• Connection of the output	to safety terminals
• Dimensions / Weight	500 x 300 x 40mm / 5kg
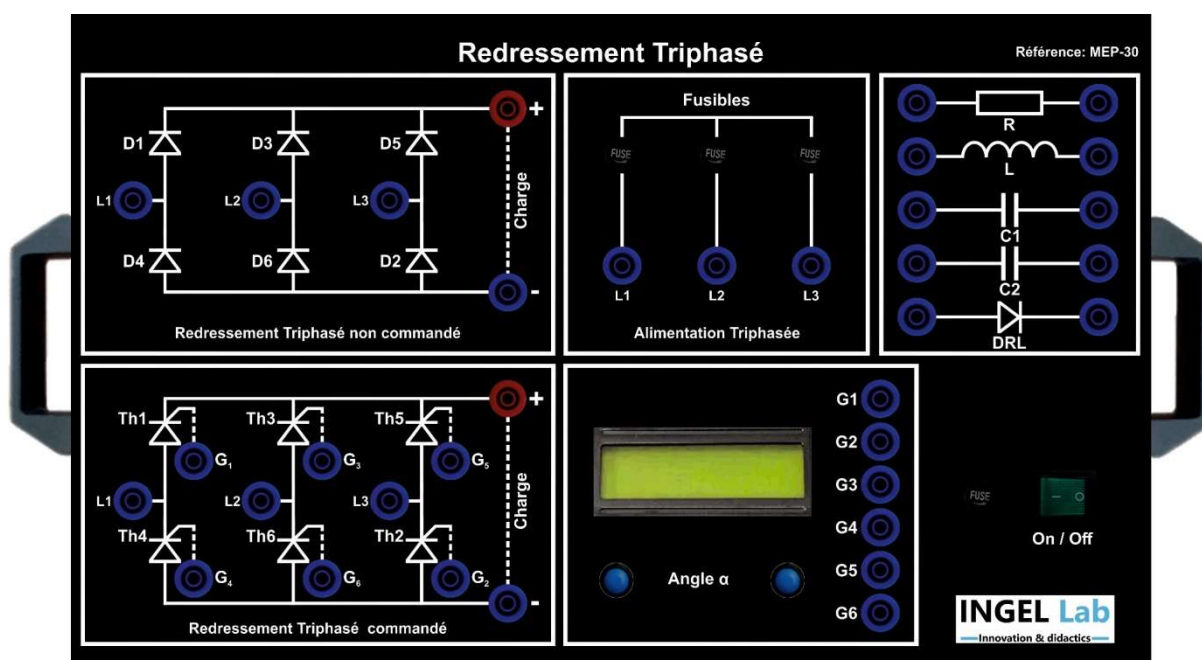
The model is equipped with an internal three-phase power supply of 9V amplitude and allows the following educational uses:

- Three-phase rectification with diodes

- Three-phase rectification with thyristors

- Rectification on R-L load, with and without freewheeling diode

Power Electronics
1, 2 and 3 Phases Inverter

This model allows students to easily practice handling with a single-phase, two-phase and three-phase inverter.

- Mains input   via single-phase cord
- M/A control   By light switch
- 230 Volt supply   voltage
- Output voltage   Fixed DC voltage -12…0…+12V
- Upstream protection   By fuse
- Connection of the output   to safety terminals
- Dimensions / Weight   500 x 300 x 40mm / 5kg

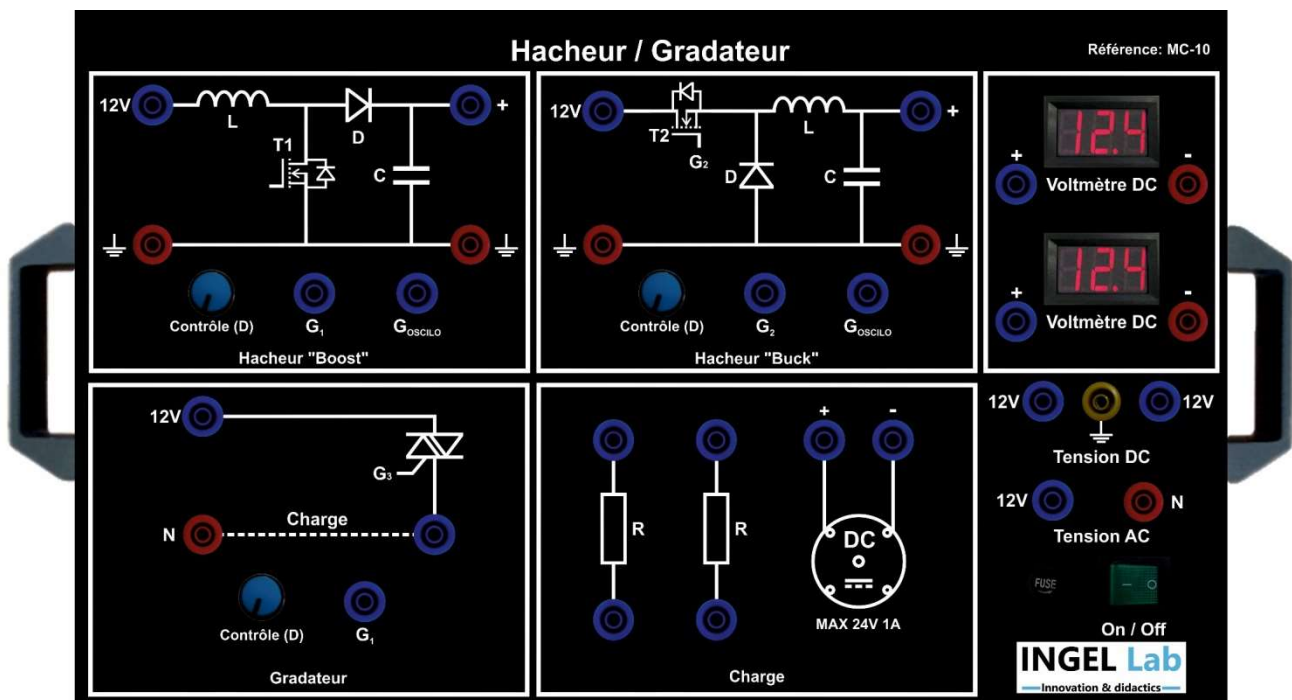**The model is equipped with a variable DC power supply -12V…0…+12V and allows the following educational operations:**

- Single-phase inverter

- Two-phase inverter

- 3 Phase Inverter Bridge

- Load: resistance, motor

Power Electronics
Chopper

This model allows students to easily practice manipulations with a chopper (Boost & Buck assemblies) and a dimmer.

- Mains input   via single-phase cord
- M/A control   By light switch
- 230 Volt supply   voltage
- 25V output   voltage
- D Cycle Ratio Variation   Per Potentiometer
- Upstream protection   By fuse
- Connection of the output   to safety terminals
- Dimensions / Weight   500 x 300 x 40mm / 5kg

**The model is equipped with two AC/DC 5V/25v power supplies and allows the following educational operations:**

- Chopper: boost dc…25V DC assembly

- Chopper: Buck assembly 2…25V DC

- Load: resistance, motor

Programmable Logic Controller (PLC)

It is a didacticised model of an Industrial Programmable Automaton (API), easy to use for efficient and fast learning. It is easy to make different connections using banana plug cables.

• Power inlet:	By single-phase cord luminous switch
• M/A control	
• Power voltage	230 Volts
• Upstream protection	By fuse
• Outlet connection	Safety bollards
• Dimensions / Weight	500 x 300 x 40mm / 5kg
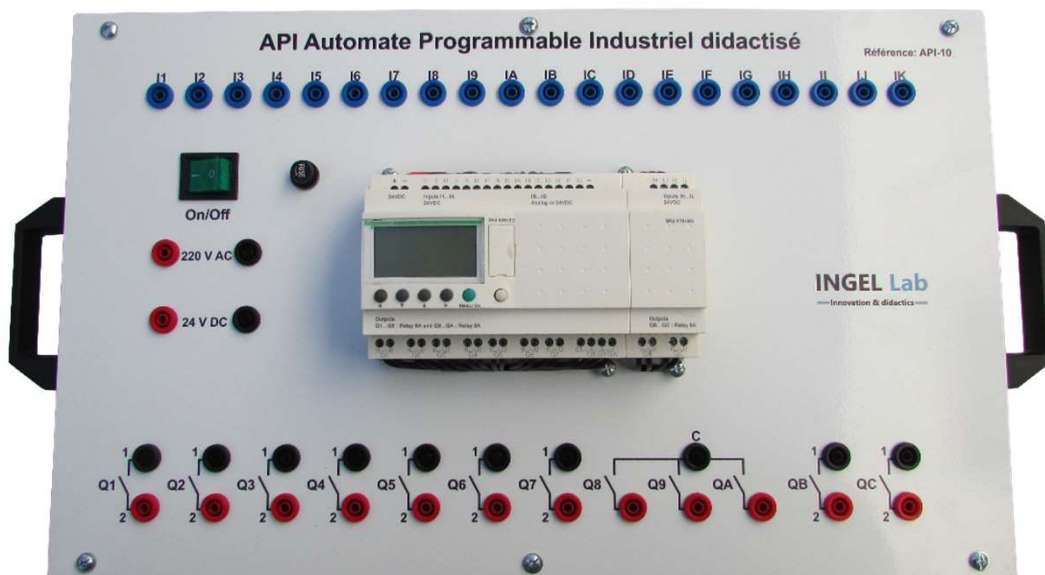
The educational objective of this set is the programming and realization of programs in ladder or logical language with the Zelio Soft 2 software (Schneider).

This model equipped with a PLC with Extension is composed of:

- 14 Tor (All or Nothing) inputs, 6 analog inputs and 12 TOR outputs.

- A socket for connection to the PC.

- A screen to view the status of Inputs/Outputs or messages regarding automation.

- Two voltages: 220 V AC and 24 V DC.

The equipment makes it possible to program, implement and carry out adjustments on automations of increasing complexity by working with its various functions.

Bench of Red Light Manipulations

This red light control model combined with the didactic API is an effective didactic solution for simplified basic learning in automatic mode.

|	
• Power inlet:	By single-phase cord
• M/A control	luminous switch
• Power voltage	230 Volts
• Output voltage	24V DC (1.5A)
• Led power supply	24V DC
• Upstream protection	By fuse
• Outlet connection	Safety bollards
• Dimensions / Weight	500 x 300 x 40mm / 4kg
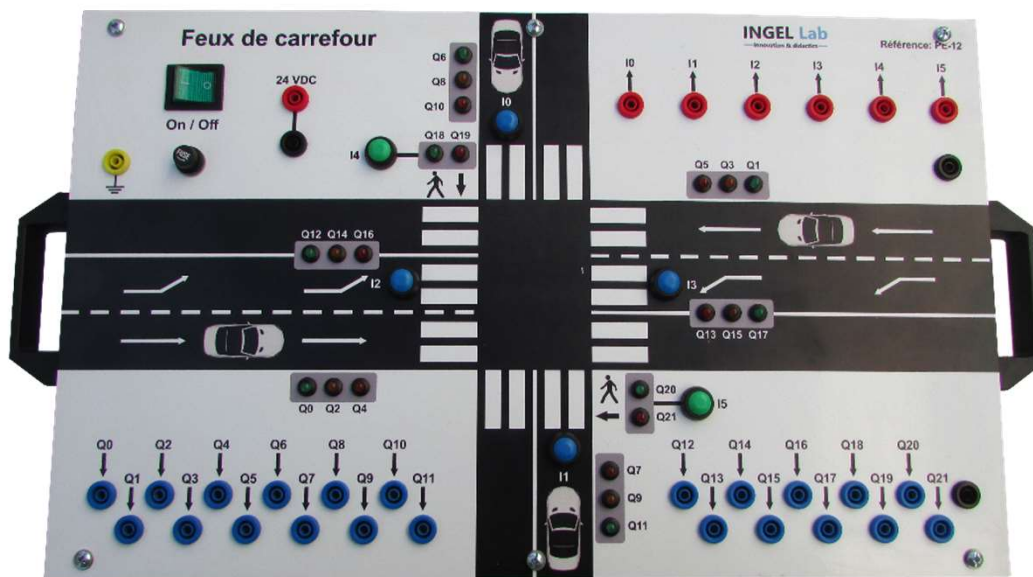
The model allows the following educational operations:

- Single traffic light sequence

- Double traffic light sequence

- Modification of the time according to traffic flow

- Pedestrian crossing (alone)

- Control of the complete system.

Basic Electronic Circuits

This model allows the student to learn the fundamental laws of electrical circuits. Equipped with a 0-24 V variable power supply, a digital voltmeter and ammeter, it offers the student everything he needs to do the manipulations. The model is protected by a fuse.

- Power inlet: By single-phase cord
- M/A control   luminous switch
- Power voltage   230 Volts
- Output voltage   24 V continuous
- Output visualization   Voltmeter and digital ammeter
- Upstream protection   By fuse
- Outlet connection   Safety bollards
- Dimensions / Weight   500 x 300 x 40mm / 4kg
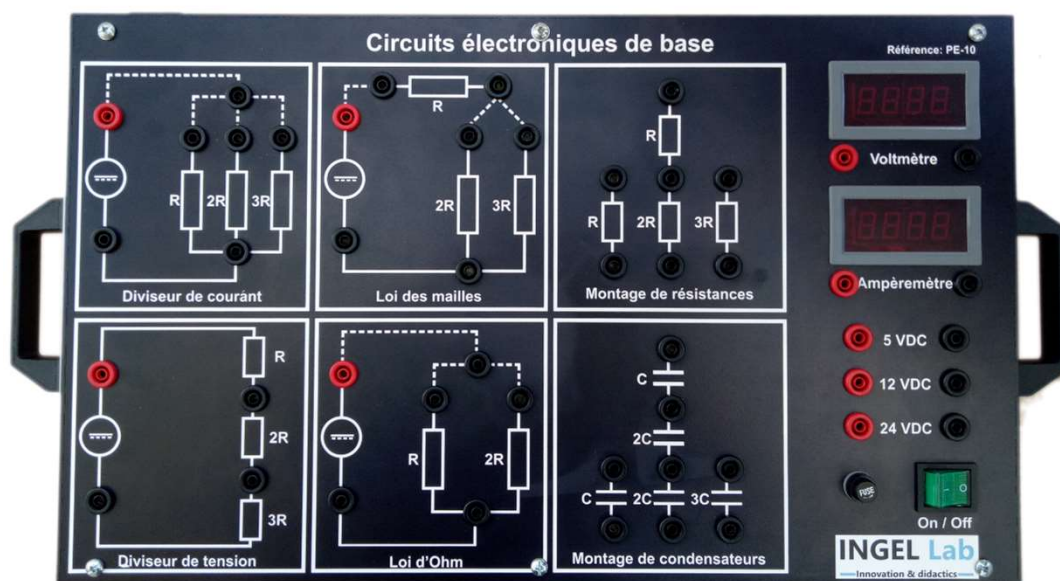
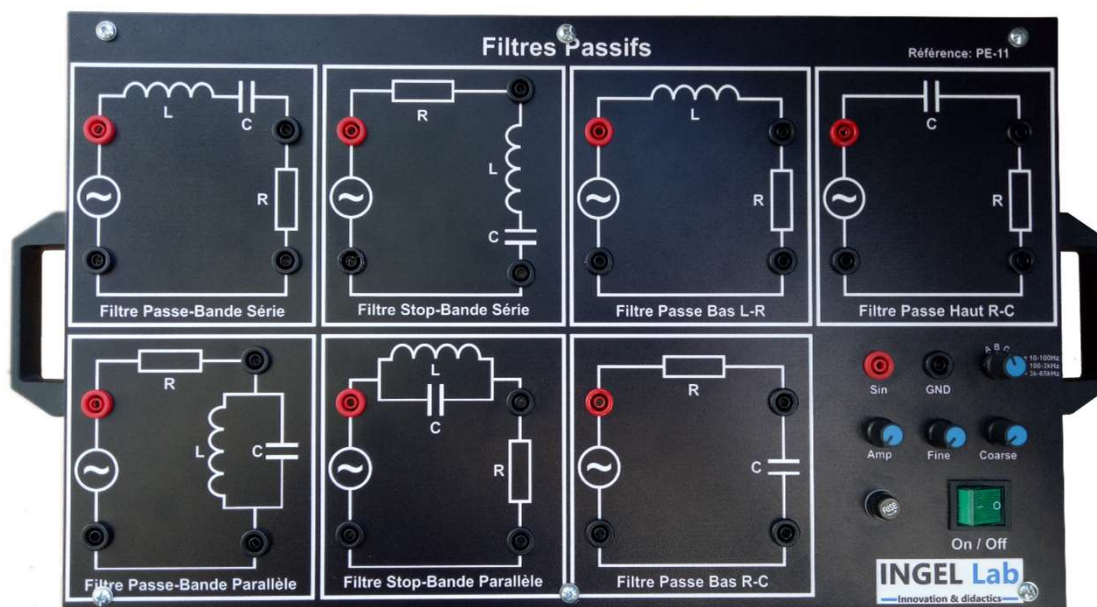**The model makes it possible to carry out the following manipulations:**

- Current divider
- Voltage divider
- mesh equation
- Ohm's law
- Resistor Assembly
- Capacitor Assembly

Passive Filters

This model allows the student to learn about the different assemblies of passive filters. Equipped with a built-in function generator, it offers the student everything he needs to do the manipulations. The model is protected by a fuse.

- Power inlet: By single-phase cord
- M/A control   luminous switch
- Power voltage   230 Volts
- Generator output voltage   0-3V sinusoidal
- Upstream protection   By fuse
- Outlet connection   Safety bollards
- Dimensions / Weight   500 x 300 x 40mm / 4kg

The model makes it possible to carry out the following manipulations:

- Bandpass Filter
- Stop-Band Filter
- Low pass Filter
- High Pass Filter

Fundamental Laws of Electronics

This model allows the student to learn the fundamental laws of electronic circuits. It is equipped with a 0-24 V AC power supply and a variable 0-30 V DC power supply, a digital voltmeter, ammeter and ohmmeter. It offers the student everything he needs to do the manipulations. The model is protected by a fuse.

- Power inlet: By single-phase cord
- M/A control   luminous switch
- Power voltage   230 Volts
- Output voltage   0-24V AC / 0-30V DC
- Output visualization   Digital voltmeter, ammeter and ohmmeter
- Upstream protection   By fuse
- Outlet connection   Safety bollards
- Dimensions / Weight   500 x 300 x 40mm / 4kg
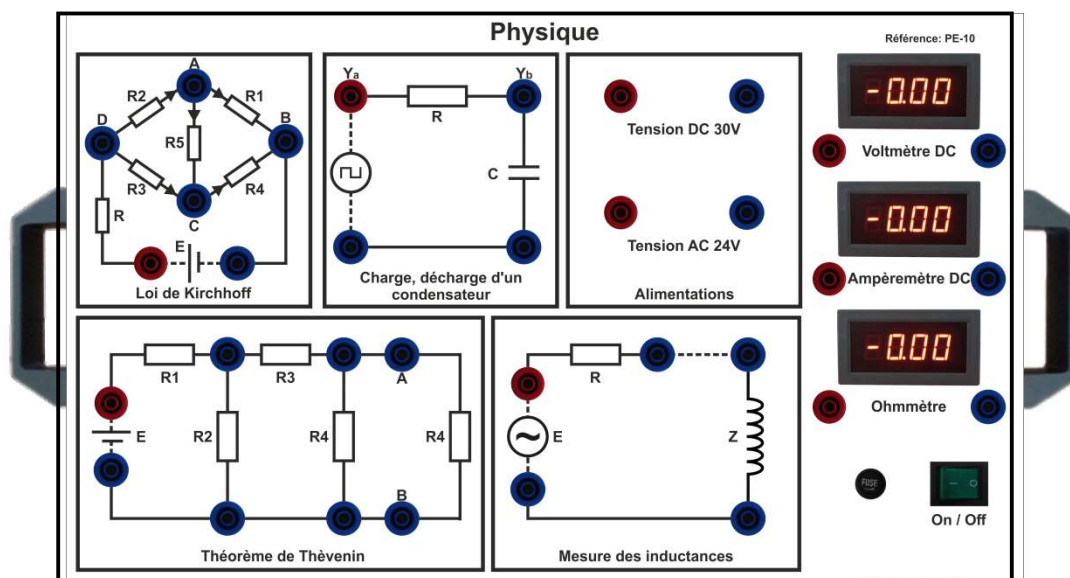
The model makes it possible to carry out the following manipulations:

- Kirchoff's Law
- discharge of a capacitor
- Thevenin's theorem
- Measuring inductances

Features:
- Two circuits to manipulate: a Thevenin circuit model and a Norton circuit model.
- Resistors of R_{th} and R_n (5 ohms - 500 ohms).
- Variable voltage source (0-10V).
- A voltmeter and a digital ammeter.
- Two variable resistive loads (5 ohms - 330 ohms).

Operational Amplifiers

This model allows the student to learn the fundamental laws of operational amplifiers. It is equipped with 3 DC voltage supplies +12V, -12V and +5V. It includes a digital voltmeter, as well as a set of different circuits for learning the different assemblies of the operational amplifiers.

- Power inlet: By single-phase cord
- M/A control   luminous switch
- Power voltage   230 Volts
- Output voltage   +12V, -12V and +5V
- Output visualization   Digital Voltmeter
- Upstream protection   By fuse
- Outlet connection   Safety bollards
- Dimensions / Weight   500 x 300 x 40mm / 4kg
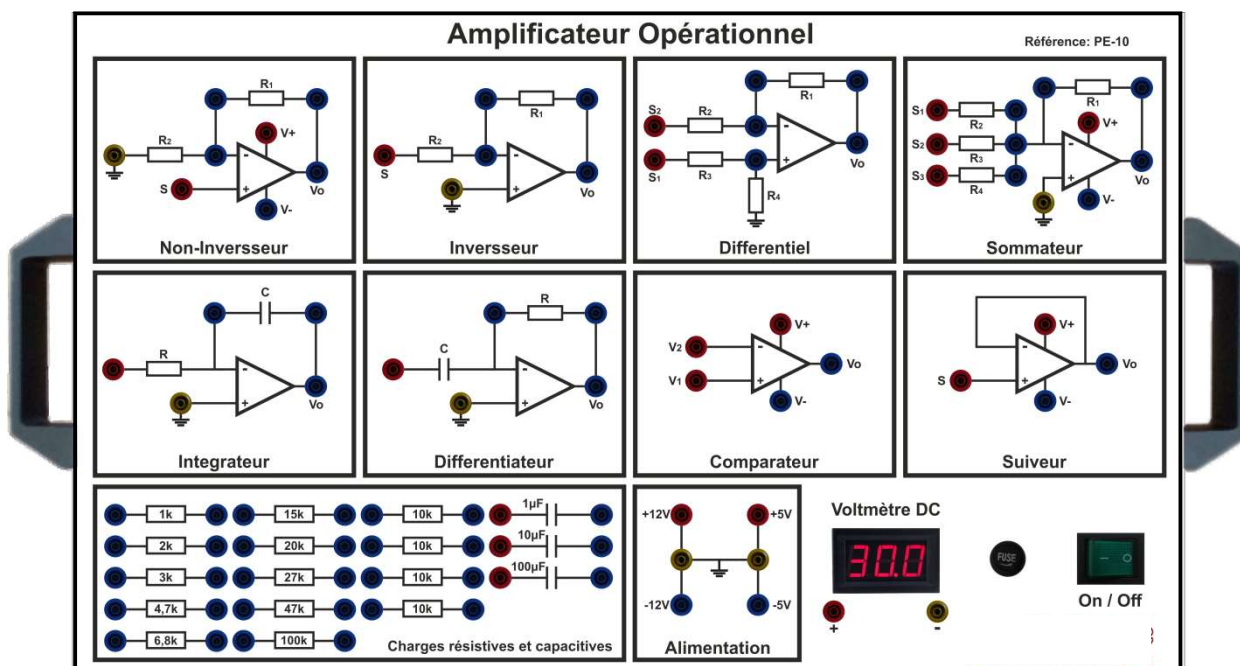
The model makes it possible to carry out the following manipulations:

- Inverter, Non-inverter
- Differential, Summator
- Integrator, Differentiator
- Comparator, Follower

Charging and Discharging a Capacitor

We have designed this model for first-year university students (Bachelor L1) to allow them to practice the basics in electronics. It aims to help them manipulate and understand the principles of charging and discharging a capacitor.

Electrical characteristics

- **Multiple capacitors** (100 µF, 470 µF, 1 mF) with rotary selector to choose the desired capacitance.

- **Multiple 1W resistors** (100Ω, 1kΩ, 4.7kΩ) with rotary selector to adjust the resistance.

- **Adjustable voltage source** (0-12V) to control the voltage applied to the circuit.

- **2 switches** to switch between capacitor charging and discharging modes.

- **A digital voltmeter** to measure the voltage across the capacitor.

- **A digital ammeter** (up to 200 mA) to measure the current in the circuit.

This improved model will allow students to better visualize and understand the charging and discharging phenomena of a capacitor, while providing a more complete and secure hands-on experience.

Diode Characteristics

We have designed this model for first-year university students (Bachelor L1) to allow them to practice the basics in electronics. It aims to help them manipulate and understand the operating characteristics of different types of diodes, including silicon diode, germanium diode and led diode. Students will be able to study parameters such as the threshold voltage, the breakdown voltage and the current flowing through each diode.

Electrical characteristics

- **5 types of diodes**: silicon diode, germanium diode, led diode, Zener diode, and Schottky diode.

- **Adjustable voltage source** (0-12V) to control the voltage applied to the circuit.

- **Digital voltmeter** to measure the voltage across the diode.

- **Digital ammeter** to measure the current through the diode.

- **Variable resistors** to limit current and protect components.

This improved model will allow students to better understand the characteristics of diodes while providing a more complete and secure hands-on experience.

Stabilized Power with Zener Diode

We have designed this model for first-year university students (Bachelor L1) to allow them to practice the basics in electronics. It aims to help them manipulate and understand how to stabilize the output voltage of a DC power supply using a Zener diode, as well as explore a positive voltage regulator based on a bipolar transistor and a Zener diode to increase the output current.

Electrical characteristics

- **Variable power supply** (0-15V) to simulate different input voltages.

- **4 Zener diode values** to study different stabilization voltages.

- **Voltage regulator** composed of a Zener diode and an NPN transistor to stabilize and boost the output current.

- **Digital voltmeter** to measure the stabilized output voltage.

- **Digital ammeter** to measure the output current.

- **Variable resistive loads** to simulate different load conditions.

This improved bench will allow students to better understand the principles of voltage stabilization with a Zener diode and bipolar transistor, while providing a more complete and secure hands-on experience.

Bipolar Transistor Features

We have designed this model for first-year university students (Bachelor L1) to allow them to think about the basics in electronics. It aims to help them manipulate and understand the characteristics and operation of bipolar transistors (NPN and PNP), as well as explore their use in switching and amplification circuits.

Features:

- **Two bipolar transistors**: an NPN transistor and a PNP transistor to study both types of polarities.

- **Two voltage sources**:

  - A voltage source (0-5V) to control the transistor base.

  - A voltage source (0-10V) to power the load between the collector and the emitter (Vce).

- **Two digital voltmeters** to measure the voltage across the base emitter (Vbe) and the collector emitter voltage (Vce).

- **Two digital ammeters** to measure base current (Ib) and collector current (Ic).

- **Variable resistive load** to simulate different load conditions.

- **Temperature measurement module**: Inclusion of a temperature sensor to study the effect of heat on transistor performance.

- **Practical application circuits**: Addition of practical circuits (amplifier, switch, etc.) to show concrete applications of bipolar transistors.

This improved model will allow students to better understand the operating principles of bipolar transistors (NPN and PNP), while providing a more complete and secure practical experience.

Resistance Measurement with Wheatstone Bridge

We have designed this model for first-year university students (Bachelor L1) to allow them to think about the basics in electronics. It aims to help them manipulate and understand the different procedures for measuring unknown resistance using the Wheatstone Bridge.

Electrical characteristics

- **5 resistance ratios** (10Ω, 100Ω, 1kΩ, 10kΩ, 100kΩ) to configure the bridge.

- **3 additional resistance ratios** (100Ω, 1kΩ, 10kΩ) for more accurate configurations.

- **Voltage source** (5V) to power the bridge.

- **Measurement range of unknown resistances** (5 Ω to >200 kΩ).

- **Digital milliamperometer** to detect the balance of the bridge (zero current point).

This improved model will allow students to better understand the principles of resistance measurement with the Wheatstone Bridge, while providing a more complete and secure hands-on experience.

Inductance Measurement with Maxwell Bridge

We have designed this model for first-year university students (Bachelor L1) to allow them to think about the basics in electronics. It aims to help them manipulate and understand the different procedures for measuring an unknown inductance using the Maxwell bridge.

Features:

- **Two resistance ratios** (100Ω and 1kΩ) to configure the bridge.

- **Inductance measurement range** (5 mH to 1 H).

- **Sine wave signal source** (2Vpp, 1kHz) to power the bridge.

- **Digital milliamperometer** to detect the balance of the bridge (zero current point).

- **Ease of use**: Simple and easy to handle design for students.

This improved model will allow students to better understand the principles of inductance measurement with the Maxwell bridge, while providing a more complete and secure hands-on experience.

Measurement of Phase Angles

We have designed this model for first-year university students (Bachelor L1) to allow them to think about the basics in electronics. It aims to help them manipulate and understand how to measure the phase shift angle between two alternating sinusoidal signals using the time slider of the oscilloscope and compare these measurements with a built-in phasemeter.

Features:

- **Two modules on a mock-up**:

    ○ A phase shift circuit for generating phase shifted signals.

    ○ A reading module to measure and display the phase shift.

- **Built-in phasemeter** designed to directly measure the phase shift angle.

- **Two sinusoidal signal generators** to produce signals with a variable phase shift.

- **Phase shift and amplitude variation** to study the effect of these parameters on the measurement.

This improved model will allow students to better understand the principles of phase shift measurement, while providing a more complete and secure hands-on experience.

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Our products are intended for higher education, national education and vocational training centers
➢ **Our motto: Availability, Quality, Warranty and After-sales Service**
➢ **Our team ready to design and produce products according to your needs**
➢ **Models of training manipulations developed according to the unified national program**

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