

EDUCATIONAL HOUSE FOR ELECTRICAL INSTALLATIONS AND TESTING

Mod. CD/EV

INTRODUCTION

The educational house for electrical installations has been designed to apply the assembling and testing techniques of electrical installations in buildings of residential, business and service sectors. This equipment complies with what stated by the technical regulations of Comitato Elettrotecnico Italiano (CEI) and by the international IEC standards. This system is used to apply the installation techniques according to standards, and in particular, to the safety of electrical installations as explained in the regulations in force. This equipment emphasizes the aspects concerning electrical testing including "visual examination" without any need of "instrumental tests" for checking the installation efficiency.

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This equipment represents a small size building for residential use designed to analyze the correct assembling and testing procedures of electrical installations according to Italian law ("Rules for safety of electrical installations").

Educational house mod. CD/EV complies with Italian (CEI) and international (IEC) standards; it is suitable to measure insulation, fault loop impedance and voltage drops, and to carry out continuity tests and checks of protection devices on already wired and operating circuits, besides enabling to carry out changes and transformations on already existing installations.

BASIC TRAINING PROGRAM:

This program includes the analysis of installations such as:

- Lighting and EMF distribution systems with energy counter (kWh)
- Staircase lighting system
- Interphone system
- Earthing and equipotential system
- TV antenna system
- Telephone distribution system
- Gas and CO alarm system
- Anti theft system

ADDITIONAL TRAINING PROGRAM THAT CAN BE IMPLEMENTED:

- Video interphone system
- Consumption optimization system
- Automatic lighting system with sensor
- Telephone system
- Electric separation with isolation transformer
- Home automation systems with PLC
- Lighting control with intelligent BUS systems.

TECHNICAL SPECIFICATIONS:

This unit is made of welded sheet steel and sections, chemically treated and painted with several coats of epoxy varnish. Each one of the 4 available walls is provided with a panel including junction boxes housing the components of the concerned system.

The whole framework is laid on a movable wheeled base.



Wall 1 (main entrance):

- 1 main power supply of 230 V – 16 A
- 1 single-phase energy meter of 230 V – 20 A
- 1 branch exchange with 2 differential circuit breakers and 3 magneto-thermal circuit breakers
- 1 antenna control unit with mixer amplifier, 4-output divider and 7 TV sockets
- 1 TV antenna installed on the roof (III – IV – V band)
- 1 interphone power supply unit with changeover switch for excluding the outdoor unit
- 1 two-button interphone porter
- 1 electric lock
- 1 lighting nameplate with pushbutton
- 1 earth collector for connecting earthing plates and equipotential node
- 4 earthing connections with resistance of 1 Ω and breaking terminals
- 1 two-zone anti theft control unit
- 1 electronic self-powered siren

Wall 2 (living room and kitchen):

- 1 lighting system with two incandescent lamps of 230 V controlled by two pushbuttons and switch relay
- 2 sockets of 230 V 16 A for power consumer devices of living room
- 1 incandescent lamp of 230 V with controller of luminous intensity
- 1 telephone jack
- 2 TV sockets for living room
- 1 electronic two-tone ringer
- 1 chronothermostat (living area)
- 1 electronic smoke/heat detector
- 1 infrared presence detector
- 1 lamp of low power consumption controlled by two two-way switches
- 3 sockets of 230 V 16 A for electric household appliances
- 2 TV sockets for kitchen
- 1 self-powered emergency lamp of 230 V
- 1 wall-type interphone communicating with outdoor unit and intercommunicating with indoor unit
- 1 ringer of 12 V for calls from bedrooms
- 1 buzzer of 12 V for emergency calls from bathrooms
- 1 buzzer for remote gas alarm
- 1 gas leak detector
- 1 micro contact for anti theft system

Wall 3 (bedroom and bathroom):

- 1 incandescent lamp controlled by two two-way switches and by an inverter
- 1 socket of 230 V 16 A for electric household appliances
- 1 single-phase socket of 230 V 10 A for lights
- 1 incandescent lamp of 230 V with controller of luminous intensity
- 1 TV socket
- 1 telephone jack
- 1 electronic two-tone ringer
- 1 electronic thermostat (sleeping area)
- 2 pushbuttons for service calls
- 1 halogen lamp of extra-low voltage controlled by a switch
- 1 pushbutton for emergency call from bathroom
- 1 electro-mechanical thermostat (bathrooms)
- 1 socket of 230 V 16 A for water heater, with magneto-thermal circuit breaker of 10 A
- 1 socket for electric shaver with transformer, controlled by switch

Wall 4 (study, stairwell and boiler room):

- 3 lamps with portable coded radio control and 2 separate dimmers
- 1 telephone jack
- 2 TV sockets
- 1 socket of 230 V 16 A for electric household appliances
- 1 single-phase socket of 230 V 10 A for lights
- 1 interphone communicating with outdoor unit and intercommunicating with kitchen
- 1 micro contact for anti theft system
- 3 incandescent lamps of 230 V with two LED pushbuttons and timing relay
- 1 microwave presence detector
- 1 socket of 230 V 16 a for heating control unit
- 3 warning lights (simulating the pumps of heated zones)
- 1 gas cutoff solenoid valve

Dimensions: 1300 x 1300 x 1800 mm

Net weight: 250 kg

ADDITIONAL SYSTEMS THAT CAN BE INSTALLED ON DEMAND:

- 1 single-family video interphone system including:
 - 1 wall-type video interphone for indoor communications
 - 1 electronic power supply
 - 1 camera module for outdoor unit
- System for optimizing consumptions:
 - 1 electronic control unit
 - 2 peripheral ON/OFF actuators
- Automatic lighting system:
 - 1 lamp controlled by presence sensor coupled to a twilight switch and to a timer
- Home automation systems:
 - 1 PLC with 20-point I/O simulator
- Telephone system:
 - 1 branch exchange with 1 exchange line and 4 extensions
 - 3 bistandard telephone sets
- Electric separation with transformer
 - isolation transformer 230/230 V - 3000 VA
- Lighting control with intelligent BUS systems:
 - 1 power supply unit of 640 mA including anti-noise coil; modular assembly on omega-shaped guide outputting and controlling the voltage for Bus system of 24 Vdc (SELV: Safety Extra-Low Voltage), provided with overvoltage suppressor for Bus line of 24 V. Input power supply: 120...230 Vac, 50/60 Hz
 - 1 USB interface for connection with personal computer, of modular assembly on omega-shaped guide including Bus coupler
 - 1 eight-channel binary output for controlling power consuming devices or groups of power consuming devices separately, with rated load of 230 V – 8 A; modular assembly on omega-shaped guide including Bus coupler
 - 4 pushbuttons connected with a 4-channel Bus coupler. This Bus coupler is assembled so that it can be inserted in control boxes

ACCESSORIES RECOMMENDED FOR ELECTRICAL TESTS ON THE EDUCATIONAL HOUSE:

- Instrument for measurements of isolation and continuity tests of protection and equipotential conductors
- Instrument for testing the functionality of differential circuit breakers
- Instrument for analyzing the fault loop and the presumed short-circuit current
- Digital current probe for measuring rated and stray currents
- 1 digital autoranging multimeter

POWER SUPPLY:

230 V /PE 50-60 Hz

Max. absorption: 3 kVA

THEORETICAL-EXPERIMENTAL HANDBOOKS

Application handbook with exercises.