

**ENGLISH**


# User manual



**Table of contents:**

1. SAFETY PRECAUTIONS AND PROCEDURES .....	2
1.1. Preliminary .....	2
1.2. During use .....	2
2. NOMENCLATURE.....	3
2.1. Instrument description .....	3
3. PREPARATION FOR USE .....	3
3.1. Initial.....	3
3.2. Supply voltage.....	3
3.3. Storage.....	3
4. OPERATING INSTRUCTIONS.....	4
5. MAINTENANCE .....	4
5.1. General information.....	4
5.2. Cleaning .....	4
5.3. End of life .....	4
6. TECHNICAL SPECIFICATIONS .....	5
6.1. Technical features .....	5
6.1.1. Electrical specifications .....	5
6.1.2. Reference guidelines.....	5
6.1.3. Mechanical characteristics .....	5
6.2. Environment .....	5
6.2.1. Environmental conditions .....	5
6.3. Accessories.....	5
6.3.1. Standard accessories.....	5
6.3.2. Optional accessories .....	5
7. SERVICE.....	6
7.1. Warranty conditions.....	6
7.2. After-sale service.....	6

## 1. SAFETY PRECAUTIONS AND PROCEDURES

This meter is in compliance with safety standards IEC/EN61557-1 and IEC/EN61010-1 related to electronic measuring instruments. For your own safety and to avoid damaging the instrument follow the procedures described in this instruction manual and read carefully all notes preceded by this symbol . When taking measurements:

- Avoid doing that in humid or wet places - make sure that humidity is within the limits indicated in § 6.2.1.
- Avoid doing that in rooms where explosive gas, combustible gas, steam or excessive dust is present.
- Keep you insulated from the object under test.
- Do not touch exposed metal parts such as test lead ends, sockets, fixing objects, circuits etc.
- Avoid doing that if you notice anomalous conditions such as breakages, deformations, fractures, leakages of battery liquid, blind display etc.
- Be particularly careful when measuring voltages exceeding 20V to avoid risk of electrical shocks.

The following symbols are used:



CAUTION – refer to the instruction manual - an improper use may damage the instrument or its components.



Double insulation



AC Voltage

### 1.1. PRELIMINARY

- This instrument has been designed for use in environments of pollution degree 2.
- It can be used for testing the phase sequence on installations of overvoltage CAT IV 300V and CAT III 600V to the ground.
- When using the instrument always respect the usual safety regulations aimed at protecting you against the dangerous electric currents and protecting the instrument against incorrect operations.
- Only the leads supplied with the instrument guarantee compliance with the safety standards in force. They must be in good conditions and, if necessary, replaced with identical ones.
- This instrument is not suitable for measurements of non sine wave voltage.
- Do not test or connect to any circuit exceeding the specified overload protection or under environmental conditions exceeding the limits indicated in § 6.1.1 and § 6.2.1.

### 1.2. DURING USE

We recommend carefully reading the following recommendations and instructions:



#### CAUTION

An improper use may damage the instrument and/or its components or injure the operator.

When the instrument is connected to measuring circuits never touch any unused terminal.

## 2. NOMENCLATURE

### 2.1. INSTRUMENT DESCRIPTION



CAPTION:

1. Input terminals
2. Display

Fig. 1: Instrument description

## 3. PREPARATION FOR USE

### 3.1. INITIAL

This instrument was checked both mechanically and electrically prior to shipment. All possible cares and precautions were taken to let you receive the instrument in perfect conditions. Notwithstanding we suggest you to check it rapidly (eventual damages may have occurred during transport – if so please contact the local distributor from whom you bought the item). Make sure that all standard accessories mentioned in § 6.3.1 are included. Should you have to return back the instrument for any reason please follow the instructions mentioned in § 7.

### 3.2. SUPPLY VOLTAGE

The instrument is self powered by the mains.

### 3.3. STORAGE

After a period of storage under extreme environmental conditions exceeding the limits mentioned in § 6.2.1 let the instrument resume normal measuring conditions before using it.

## 4. OPERATING INSTRUCTIONS



### CAUTION

Do not test or connect to any circuit exceeding the specified overload protection. Do not attempt to measure higher voltages to avoid electrical shocks or damages to the instrument.

1. Connect the test cables by following their numbering.
2. Apply the relevant alligator clips to the free ends of the cables.
3. Connect the alligator clips to the electrical mains.
4. The instrument shows:
  - The connected phase cables, L1, L2, L3 referred to the relevant inputs (two cables have to be connected at least).
  - The phase sequence: the letter “R” with a clockwise arrow indicates the correct phase sequence, the letter “L” with a counterclockwise arrow indicates the incorrect phase sequence.

## 5. MAINTENANCE

### 5.1. GENERAL INFORMATION

This is a precision instrument. To guarantee its performances be sure to use it according to these instructions and keep it stored on suitable environmental conditions Do not expose it to high temperatures or humidity or direct sunlight.

### 5.2. CLEANING

To clean the instrument use a soft dry cloth. Never use a wet cloth, solvents or water.

### 5.3. END OF LIFE



**CAUTION:** this symbol indicates that equipment and its accessories shall be subject to a separate collection and correct disposal.

## 6. TECHNICAL SPECIFICATIONS

### 6.1. TECHNICAL FEATURES

#### 6.1.1. Electrical specifications

Input voltage range:	40V ÷ 690V AC
Frequency voltage range:	15Hz ÷ 400Hz
Absorbed current (by phase):	1mA

#### 6.1.2. Reference guidelines

Safety:	IEC/EN61010-1
EMC:	IEC/EN61326-1
Insulation:	double insulation
Pollution degree:	2
Measurement category:	CAT III 600V, CAT IV 300V to ground
Max height of use:	2000m (6561ft)

#### 6.1.3. Mechanical characteristics

Dimensions (L x W x H):	130 x 69 x 22mm (5 x 3 x 1in)
Weight:	130g (4ounces)
Mechanical protection:	IP40

#### Power supply

From the mains.

#### Display

Characteristics:	Custom with phase sequence and detected phases indications
------------------	--

### 6.2. ENVIRONMENT

#### 6.2.1. Environmental conditions

Working temperature:	0°C ÷ 40°C (32°F ÷ 104°F)
Relative humidity:	<80%RH
Storage temperature:	0°C ÷ 40°C (32°F ÷ 104°F)
Storage humidity:	<80%RH

**This instrument satisfies the requirements of Low Voltage Directive 2014/35/EU (LVD) and of EMC Directive 2014/30/EU**

**This instrument satisfies the requirements of European Directive 2011/65/EU (RoHS) and 2012/19/EU (WEEE)**

### 6.3. ACCESSORIES

#### 6.3.1. Standard accessories

- KIT82: set of 3 test cables + 3 alligator clips
- Carrying case
- User manual.

#### 6.3.2. Optional accessories

- 404-IEC#: test lead (# = color)
- 5004-IEC#: alligator clip (# = color)
- 5001-#: test cable (# = color)

## 7. SERVICE

### 7.1. WARRANTY CONDITIONS

This instrument is guaranteed against material or production defects, in accordance with our general sales conditions. During the warranty period the manufacturer reserves the right to decide either to repair or replace the product. Should you need for any reason to return back the instrument for repair or replacement take prior agreements with the local distributor from whom you bought it. Do not forget to enclose a report describing the reasons for returning (detected fault). Use only original packaging. Any damage occurred in transit due to no original packaging will be charged anyhow to the customer. The manufacturer will not be responsible for any damage to persons or things.

The warranty doesn't apply to:

- Accessories (not covered by warranty).
- Repairs made necessary by improper use (including adaptation to particular applications not provided in the instructions manual) or improper combination with incompatible accessories or equipment.
- Repairs made necessary by improper shipping material causing damages in transit.
- Repairs made necessary by previous attempts for repair carried out by unskilled or unauthorized personnel.
- Instruments for whatever reason modified by the customer himself without explicit authorization of our Technical Dept.
- Incorrect use do not compliance to instrument specifications or to user's manual.

The contents of this manual may not be reproduced in any form whatsoever without the manufacturer's authorization.

**Our products are patented and our logotypes registered. We reserve the right to modify specifications and prices in view of technological improvements or developments which might be necessary.**

### 7.2. AFTER-SALE SERVICE

Shouldn't the instrument work properly, before contacting your distributor make sure that batteries are correctly installed and working, check the test leads and replace them if necessary. Make sure that your operating procedure corresponds to the one described in this manual. Should you need for any reason to return back the instrument for repair or replacement take prior agreements with the local distributor from whom you bought it. Do not forget to enclose a report describing the reasons for returning (detected fault). Use only original packaging. Any damage occurred in transit due to non original packaging will be charged anyhow to the customer. The manufacturer will not be responsible for any damage to persons or things.