

# PE-335

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## *DIGITAL EARTH RESISTANCE TESTER*




- 0 M1315 -



## **SAFETY NOTES**

*Read the user's manual before using the equipment, mainly " SAFETY RULES " paragraph.*

The symbol  on the equipment means "SEE USER'S MANUAL". In this manual may also appear as a Caution or Warning symbol.

*Warning and Caution statements may appear in this manual to avoid injury hazard or damage to this product or other property.*

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# DIGITAL EARTH RESISTANCE TESTER

## PE-335

### 1. GENERAL

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

**NOTE:** This meter has been designed and tested according to IEC Publication 348. Safety Requirements for Electronic Measuring Apparatus. IEC-1010 (EN61010) and other safety standards. Follow all warnings to ensure safe operation.

#### 1.1 Features

- It carries out the earth resistance measurements by using the three-electrodes method.
- Capable of measuring earth voltage.
- 2 mA measuring current permits earth resistance tests without tripping earth leakage current breakers in the circuit under test.
- It allows the measurement by using the simplified two-electrodes method.
- Data hold function.
- Battery operated.
- Large LCD display.
- Timer for test function (count 3 ~ 5 minutes).

#### 1.2 Specifications

<b>Measurement system</b>	By means of a current injection of 820 Hz and 2 mA approx.
<b>Earth voltage</b>	0 ~ 199.9 V AC, 50 / 60 Hz.
<b>Maximum input voltage</b>	200 V rms
<b>Earth resistance</b>	
<b>Range and resolution:</b>	0 ~ 19.99 $\Omega$ (0.01 $\Omega$ ) 0 ~ 199.9 $\Omega$ (0.1 $\Omega$ ) 0 ~ 1999 $\Omega$ (1 $\Omega$ )

<b>Accuracy</b>	
<b>Earth resistance:</b>	$\pm(2\% \text{ rdg} + 2 \text{ dgt})$ or $\pm 0.1 \Omega$ , which is greater.
<b>Earth voltage:</b>	$\pm(1\% \text{ rdg} + 2 \text{ dgt})$
<b>Resp. time</b>	From 4 to 8 seconds.
<b>Low battery indication</b>	 symbol appears on the display
<b>Data hold indication</b>	 symbol appears on the display
<b>Over range indication</b>	It appears "1" to the left of the screen
<b>Display</b>	LCD 3 ½ digit (2000 counts)
<b>Power supply</b>	9 V DC (6 x 1.5 V type R6)
<b>NOTE:</b> Equipment specifications are set in the following environmental operating conditions. Operation outside these specifications are also possible. Please check with us if you have specific requirements.	
<b>Operating environmental conditions</b>	
<b>Altitude</b>	Up to 2000 m.
<b>Temperature range</b>	From $-10 \text{ }^{\circ}\text{C}$ to $55 \text{ }^{\circ}\text{C}$ .
<b>Max. relative humidity</b>	20% - 90%.
<b>Storage temperature</b>	From 20 to $-60 \text{ }^{\circ}\text{C}$ .
<b>Dimensions</b>	90 L. x 205 W. x 55 D. (mm).
<b>Weight</b>	Approx. 600 g. (battery included)
<b>Accessories</b>	<b>PP012</b> Test cables set 2 auxiliary earth spikes User's manual Transport suitcase

### RECOMMENDATIONS ABOUT THE PACKING

It is recommended to keep all the packing material in order to return the equipment, if necessary, to the Technical Service.

## 2. SAFETY RULES

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### 2.1 General

\* This equipment can be used in **Overvoltage Category III** installations and **Pollution Degree 2** environments.

\* When using some of the following accessories **use only the specified ones** to ensure safety.

Test leads

\* Check **test leads** integrity before using them.

\* Observe all **specified rating** both of supply and measurement.

\* Remember that voltages higher than **60 V DC** or **30 V AC rms** are dangerous.

\* Use this instrument under the **specified environmental conditions**.

\* **The user is only authorised to** carry out the following maintenance operations:
















Battery replacement.

On the Maintenance paragraph the proper instructions are given.

Any other change on the equipment should be carried out by qualified personnel.

\* Follow the **cleaning instructions** described in the Maintenance paragraph.

\* Symbols related with safety:

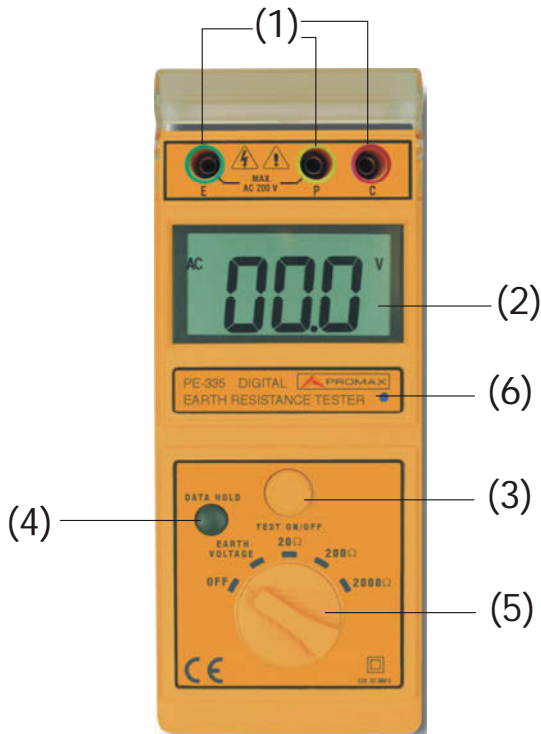
	DIRECT CURRENT		ON (Supply)
	ALTERNATING CURRENT		OFF (Supply)
	DIRECT AND ALTERNATING		DOUBLE INSULATION (Class II protection)
	GROUND TERMINAL		CAUTION (Risk of electric shock)
	PROTECTIVE CONDUCTOR		CAUTION REFER TO MANUAL
	FRAME TERMINAL		FUSE
	EQUIPOTENTIALITY		EQUIPMENT OR COMPONENT TO BE RECYCLED
			

## 2.2 Descriptive Examples of Over-Voltage Categories

- Cat I**      Low voltage installations isolated from the mains.
- Cat II**     Portable domestic installations.
- Cat III**    Fixed domestic installations.
- Cat IV**    Industrial installations.



### 3. PRODUCT LAYOUT




1. Terminals for connecting
2. LCD screen
3. Press TEST ON/OFF to start/stop measurement
4. Press DATA HOLD to memorise the measurement
5. Function rotary selector
6. Battery-OK LED indicator

English



## 4. MEASURING METHODS

**BEFORE PROCEEDING MEASUREMENT, READ SAFETY RULES ON PAGE 3.**

1. In proceeding with measurement, if  symbol appears on the display, replace with new batteries in order to avoid wrong measurements.
2. Precision earth resistance measurement method:
  - (1) Connect green, yellow and red test leads to instrument terminals E, P and C with auxiliary earth spikes P1, C1 stuck into earth "IN A STRAIGHT LINE". (Fig. 1).
  - (2) Rotary to function switch to **EARTH VOLTAGE** position and press TEST ON/OFF to test. Earth voltage will displayed on the LCD. When earth voltage is more than 10 V, it may result in errors in earth resistance measurement. Accurate earth resistance measurement may not be made, location of spikes must be checked.
  - (3) Rotary the function switch to suitable range then press the pushbutton press TEST ON/OFF to test and take the reading.

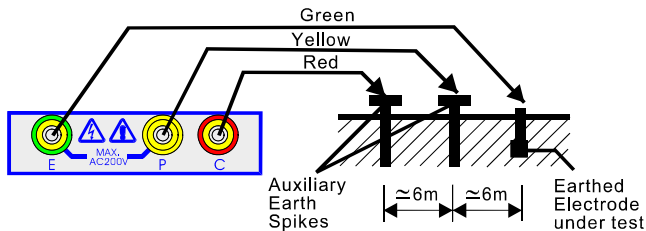


Figure 1.-

3. Simplified earth resistance measurement method:
  - (1) This method is recommended where an earth resistance higher than  $10\Omega$  is measured or where it is not possible to drive auxiliary earth spikes. An approximated value of the earth resistance can be obtained by means of using the double wiring method shown in the figure 2).
  - (2) Rotary to function switch to **EARTH VOLTAGE** position and press TEST ON/OFF to test. Make certain that earth voltage is less than 10 V.

- (3) First rotary the function switch to **200Ω** position and press to test, read earth resistance. If the display shows "1" (MSD), switch to **2000Ω** position and read earth resistance.
- (4) The reading obtained (Rx) is an approximate earth resistance value. In order to make this measurement, terminals P (yellow) and C (red) must be short-circuited before.

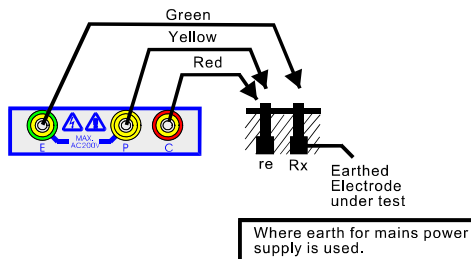



Figure 2.-

- (5)  $R_x = R_e - r_e$   
 $R_x$  = True Earth Resistance  
 $R_e$  = Indicated Value  
 $r_e$  = Earth Resistance or Earth Electrode
- (6) Since measuring current is as low as 2 mA, the earth leakage current breaker (ELCB) does not trip even if the earth side of the commercial power supply with an ELCB is used.

Follow the proper connection such as fig. 1 the LED (red) indication will lit. This proves a correct current circulation is under its operation.

## 5. MAINTENANCE

### 5.1 Battery Replacement

When the symbol  appears on the display, replace with new batteries, as follows:

1. Disconnect the test leads from the instrument and turn off the power.
2. The compartment for batteries is located at the rear side of the equipment.
3. Use a screwdriver to unscrew the screws on back cover then slide the cover, take out the batteries and replace with new batteries type R6.
4. Place back cover and secure by 2 screws.

### 5.2 Cleaning and storage

**WARNING:** To avoid electrical shock or damage to the meter, do not get water inside the case.

Periodically wipe the case with a damp cloth and detergent: do not use abrasives or solvents.

If the meter is not to be used for periods of longer than 60 days, remove the batteries and store them separately.



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PROMAX ELECTRONICA, S. L.