

# MARTINDALE ● ● ● ELECTRIC

**RC2000**

DIGITAL  
RCD TESTERS

**INSTRUCTION MANUAL**

Martindale Electric Company LTD

TABLE OF CONTENTS	PAGE
TABLE OF CONTENTS	1
1. SAFETY RULES	2-3
2. DESCRIPTION	4
3. OPERATING INSTRUCTIONS	5-8
4. SPECIFICATIONS	
4.1 Electrical	9
4.2 Mechanical	10
4.3 Environmental	11
5. SPARES & ACCESSORIES	11
6. REPAIRS	11
7. LIMITED WARRANTY	12

## **1. SAFETY RULES**

### **WARNING**

**DISCONNECT FROM SUPPLY BEFORE OPENING  
TESTER**



This tester has been designed with your safety in mind. However, no design can completely protect against incorrect use. Electrical circuits can be dangerous if lack of caution and/or poor safety practices are used.

### **READ THE MANUAL**



Read this Instruction Manual carefully and completely. Voltages and currents within the capability of this instrument can be hazardous. Follow the instructions in this manual for every test. Read and understand the general instructions before attempting to use this tester. Do not exceed the limits of this tester.

### **SAFETY CHECK**

Double check the lead connections before making a test.

Are you following all the instructions?

Use only the specified type of fuse and insert it correctly.

Do not use leads that are damaged and in need of repair.

Do not use in wet conditions.

**THIS INSTRUMENT SHOULD ONLY BE USED BY A  
COMPETENT, SUITABLY TRAINED PERSON.**

### **REMEMBER**

**SAFETY IS NO ACCIDENT**

## 2. DESCRIPTION

The Digital RCD Tester is ideally suited for the testing of Residual Current Protection Devices, in compliance with the 16th Edition of the IEE Wiring Regulations.

The tester is designed to test the most common RCDs in use, with a selector switch providing Fast, I and ½ Trip current settings. The Fast setting provides 150mA trip current for RCDs not exceeding 30mA. The I setting provides full rated trip current, which should cause the RCD under test to trip. The ½ setting provides half the rated trip current whereby the RCD should not trip.

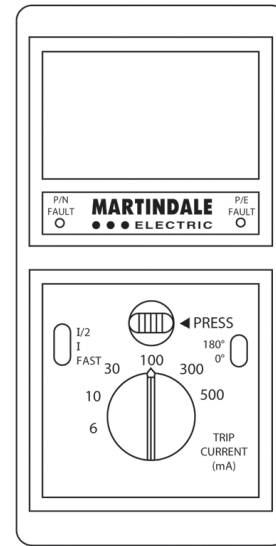
Other features include a polarity switch with 0° and 180° settings which permits a test cycle to commence with a positive or negative going wave form from the zero cross-over point. The facility to establish whether the system under test is correctly wired is provided by means of neon lamps and monitoring of the voltage present on the earth terminal.

The instrument has thermal and fuse protection. The thermal protection provides a time delay between tests, which will vary with the range of model. When the time delay is in operation the **READY** symbol is disabled. At the end of the time delay the **READY** symbol is displayed and testing can continue.

-4-

## 3. OPERATING INSTRUCTIONS

For testing RCDs to BS EN 61557



To operate the RCD, the tester should be connected to a convenient outlet socket on the electrical circuit supplied from the RCD to be tested. The mains lead provided with the instrument facilitates this connection as one end plugs into the CEE 22 (IEC 320) socket at the top of the instrument while the other end allows connection to the outlet socket with a suitable mains plug.

-5-

- (A) Connect the mains lead into the tester by means of the IEC socket provided.
- (B) Connect the mains lead to a socket outlet supplied from the RCD to be tested.
- (C) Set the trip current selector switch to the current rating of the RCD to be tested. Set the range switch to I and the polarity switch to 0°. It is recommended that the test is repeated with the switch in the 180° position.
- (D) Switch on the supply and check that both lamps on the tester, marked P/N and P/E, have illuminated. If this is the case then proceed with the test. If either or both of the lamps are off, discontinue the test and correct the wiring fault before proceeding. (An indication of possible wiring faults can be found on page 9).
- (E) To proceed with the test the **READY** symbol must be displayed. Press and hold the test switch and the reading displayed will be the time taken in mSec for the RCD to trip.
- (F) Should the RCD under test fail to trip within 2000 milliseconds the **OVER RANGE** symbol on the tester will indicate that the unit has failed. Where the RCD under test trips within 500 or 2000 milliseconds, the trip time will be displayed on the LCD. With a fault current flowing equivalent to 100% of the rated tripping current of the RCD, the device will open in less than 200ms.

-6-

- (G) The RCD should also be tested to ensure that it can withstand half the rated trip current without tripping. Set the range switch to ½ then test as before. The RCD under test should not trip and the **OVER RANGE** symbol will indicate a successful test after 2000 milliseconds have elapsed.
  - (H) If the **READY** symbol is not visible on the LCD, the thermal time delay is operating to protect the instrument against overheating, there is voltage greater than 50Vr.m.s. between the earth and neutral terminals or the instrument has a fault. If ~ symbol is displayed, then there is a voltage greater than 50 Vrms between the earth and neutral terminals. If the **READY** symbol appears after a few minutes, then the tester has overheated, and testing can be resumed. If not, check the wiring lamps to see if they indicate a wiring fault which could cause a voltage between the phase and neutral terminals.
  - (I) Where RCDs with a current rating not exceeding 30mA have been installed, it is necessary for the RCD to trip within 40 milliseconds when 150mA is applied. Set the range switch to **FAST** for 150mA trip current and proceed as before.
- NOTE:** Setting the range switch to **FAST** over-rides the trip current selector switch.
- (J) The time for the full trip current test is set to 2000mS or 500mS by means of a switch on the front edge of the tester beside the mains inlet. A multi-purpose mains lead is available for testing RCDs where the final sub-circuits are not connected to socket outlets.

-7-

## CIRCUIT WIRING CHECK

P/N LAMP	P/E LAMP	CIRCUIT CONDITION
ON	ON	WIRING CORRECT
OFF	ON	PHASE & EARTH REVERSED OR NEUTRAL DISCONNECTED
ON	OFF	PHASE & NEUTRAL REVERSED OR EARTH DISCONNECTED
OFF	OFF	PHASE DISCONNECTED OR NEUTRAL & EARTH DISCONNECTED OR FUSE BLOWN OR SUPPLY OFF

Always disconnect the tester from the mains supply before replacing the instrument fuse. To change the instrument fuse first remove the four retaining screws accessible from the rear of the instrument. With the case on its back, remove the front cover and replace the fuse found on the under side of the PCB.

## 4. SPECIFICATION

### 4.1 ELECTRICAL

Supply Voltage: 240 Volts AC, 50/60Hz

#### Test Currents

I, Full Trip Settings: 6mA – 10mA – 30mA – 100mA – 300mA – 500mA

I/2, Half Trip Settings: 3mA – 5mA – 15mA – 50mA – 150mA – 250mA

FAST Trip Setting: 150mA (Applicable to Full Trip Settings of 6, 10 and 30mA only)

#### Test Current

Accuracy: ± 3% at 240V AC Supply Voltage  
Rising Linearly To ±9% at ± 6% of 240V Supply Voltage

Timing Range: 0 to 1999 mSec in steps of 1mSec  
Timing Accuracy: ±2% of reading ± 1 digit

### Test Current

Duration: ½ 2 seconds  
I 0.5 or 2 seconds selectable  
FAST 0.05 seconds  
Fuse: 1amp, HBC, ceramic,  
5 x 20mm

Transient Protection: VDR at input  
Safety: EMC: Meets BS EN 50081-1  
BS EN 50082-1  
LVD: Meets BS EN 61010-1

## 4.2 MECHANICAL

Height: 54mm (Excluding knob)  
Length: 190mm  
Width: 90mm  
Case Material: Top – ABS  
Base – ABS  
Window – Polycarbonate  
Weight (less carry case): 0.35 Kg  
Display: Liquid Crystal  
Sockets: CEE 22 (IEC 320)  
Mains Lead: 1.5 metres long

## 4.3 ENVIRONMENTAL

Operating Temperature Range: 0°C to +40°C  
Humidity: 95%RH at 40°C

Storage Temperature Range: –20°C to +70°C

## 5. SPARES AND ACCESSORIES

Mains Lead 240V only: TL205  
Fuse 1A 250V: FUSE 1A250  
Flying Lead: TL88

## 6. REPAIRS

Please return the tester to:  
**Martindale Electric Company Ltd**  
**Metrohm House**  
**Penfold Trading Estate**  
**Imperial Way**  
**Watford WD24 4YY**

## **7. LIMITED WARRANTY**

Martindale Electric Co Ltd warrant instruments and test equipment manufactured by them to be free from defective material or factory workmanship and agree to repair or replace such products which, under normal use and service, disclose the defect to be the fault of our manufacturing, with no charge for parts and service. If we are unable to repair or replace the product, we will make a refund of the purchase price. Consult the Instruction Manual for instructions regarding the proper use and servicing of instruments and test equipment. Our obligation under this warranty is limited to repairing, replacing or making refund of any instrument or test equipment which proves to be defective within twenty four months from the date of original purchase. This warranty does not apply to any of our products which have been repaired or altered by unauthorised persons in any way so as, in our sole judgement, to injure their stability or reliability, or which have been subject to misuse, abuse, misapplication, negligence or accident or which have had the serial numbers altered, defaced or removed. Accessories, not of our manufacture used with this product, are not covered by this warranty. To register a claim under the provisions of this warranty, return the instrument or test equipment to Martindale Electric Company Ltd, Metrohm House, Penfold Trading Estate, Imperial Way, Watford WD24 4YY. Upon our receipt and inspection of the product we will advise you as to the situation regarding your claim.

ALL WARRANTIES IMPLIED BY LAW ARE HEREBY LIMITED TO A PERIOD OF 24 MONTHS, AND THE PROVISIONS OF THE WARRANTY ARE EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES EXPRESSED OR IMPLIED.

The purchaser agrees to assume all liability for any damages and bodily injury which may result from the use or misuse of the product by the purchaser, his employees, or others, and the remedies provided for in this warranty are expressly in lieu of any other liability Martindale Electric Co Ltd may have including incidental or consequential damages.

-12-

Martindale Electric Co Ltd reserve the right to discontinue models at any time, or change specification, price or design, without notice and without incurring any obligation.



Martindale Electric Company LTD  
Metrohm House  
Penfold Trading Estate  
Imperial Way  
Watford  
Herts WD24 4YY  
T: 01923 441717  
F: 01923 446900  
Email: [sales@martindale-electric.co.uk](mailto:sales@martindale-electric.co.uk)  
web: [www.martindale-electric.co.uk](http://www.martindale-electric.co.uk)

LITRC2000  
ISSUE 7 04/06