RC2000 RCD TESTER

INSTRUCTION MANUAL

MARTINDALE ELECTRIC

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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 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.

3. OPERATING INSTRUCTIONS

Preparation

Note 1
Note that, when the RCD is tripped during the RCD testing procedure, mains power will be removed from all electrical equipment connected to the mains circuit that is protected by the RCD.
Similarly, all connected equipment will re-start when the RCD is reset at certain stages in the testing procedure.
There are safety implications associated with both these occurrences that should be taken into account.

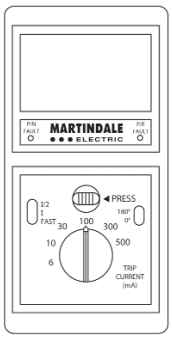
For this reason it is recommended that all relevant equipment is switched off and disconnected from the mains circuit before RCD testing begins.

Note 2
In addition, some equipment may have a level of earth leakage that is significant. For example, a leakage of 3mA can be typical of PCs. Since a 30mA RCD MUST trip before 30mA leakage is detected, and MAY trip at a level of earth leakage as low as 22mA, a mains circuit with eight PCs connected may be operating with enough earth leakage to cause an RCD to trip unexpectedly even before the RCD testing procedure is begun. Under these conditions, the RCD tripping characteristics cannot be measured accurately by the RCD tester.

For the purpose of measuring accurately the sensitivity of the RCD to earth leakage currents, it is recommended that all relevant equipment is switched off and disconnected from the mains circuit before RCD testing begins.

Note 3
Thirdly, certain types of equipment should be taken into account, which contain capacitors or which contain motors. If these are left connected and powered ON while the RCD testing procedure is followed, the effect of stored capacitance or motor free-wheeling can be to inject power into the disconnected mains circuit after the RCD has tripped, causing a delay in the collapse of the voltage in this circuit. As a result, the RCD tester may record considerably longer RCD tripping times than may be truly the case.

For the purpose of measuring accurately the response time of the RCD, it is recommended that all relevant equipment is switched off and disconnected from the mains circuit before RCD testing begins.



To operate
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.

(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.

(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 OVERRANGE 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.

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

Duration of test current: 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 bythem to be free from defective material or factory workmanship and agree to repair orreplace 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 repairor 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 oraltered 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.

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- Specialist Drummond Testers

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