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CMR0011
ISSUE 1

METROHM

MODEL 7A501 & MRE981
INTRINSICALLY SAFE
INSULATION & CONTINUITY
TESTERS

INSTRUCTION MANUAL

Edgcombe Instruments Limited

P. No. 0015 Edgcombe.

SAFETY RULES

WARNING



DISCONNECT TEST LEADS 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 and/or lethal when lack of caution or poor safety practices are used.

When using this tester to monitor high voltages turn off the power before connecting the tester.

Where possible, do not touch the tester or its leads when the power is on.

Turn off the power before disconnecting the tester.

READ THE MANUAL



Read this Instruction Manual carefully and completely.

Voltages within the capability of this tester can be hazardous. Follow the instructions in this manual for every measurement. Read and understand the general instructions before attempting to use this tester.

SAFETY CHECK

Double check the switch setting, and lead connections before making measurements. Are you following instructions?

When changing the battery or removing the cover to access the internal circuitry, always disconnect the test leads.

DON'T TOUCH

Don't touch exposed wiring, connections or other 'live' parts of an electrical circuit. If in doubt, check the circuit first for voltage before touching it.

Turn off the power to a circuit before connecting test probes to it. Be sure there is no voltage present before you touch the circuit. Do not use cracked or broken test leads.

HIGH VOLTAGE IS DANGEROUS

Always start with the power turned off. Be sure there is no voltage present before making connections to the circuit.

Before disconnecting the tester, turn the circuit off and wait for the meter to return to 'zero'.

HAZARDOUS LOCATIONS

In hazardous locations where inflammable gases may be present, it is important to remember certain precautions must be taken.

There are:

1. DO NOT FLICK THE TEST LEADS
2. CONNECT TEST LEADS SECURELY TO CIRCUIT UNDER TEST
3. RELEASE OPERATING BUTTON BEFORE DISCONNECTING TEST LEADS

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

REMEMBER: SAFETY IS NO ACCIDENT.

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DESCRIPTION

Two versions of intrinsically safe insulation and continuity testers are available. These are the 7A501 which is a basic unit and the MRE981 which has additional ranges and features.

The 7A501 has been approved for use on Intrinsically Safe Circuits and Apparatus conforming to BS 1259 (1958). It carries the Ministry of Power Certificate Number IS 1428 (Class 1) and the Factory Inspectorate Certificate Number 2148 (Class 2a and 2C) which covers Methane, Ammonia and Hydro-carbons.

The MRE981 is specifically approved by British Coal and carries the Mintech Certificate Number IS 1655 (Class 1) which covers Methane.

Both testers have an analogue display and 500 volts DC insulation test voltage with a short circuit current of less than 2mA. On continuity the test voltage is nominally 200mV with a short circuit current of 26mA maximum. A special allen key is required to access the batteries so that they may not be changed in a hazardous area.

OPERATING INSTRUCTIONS — 7A501

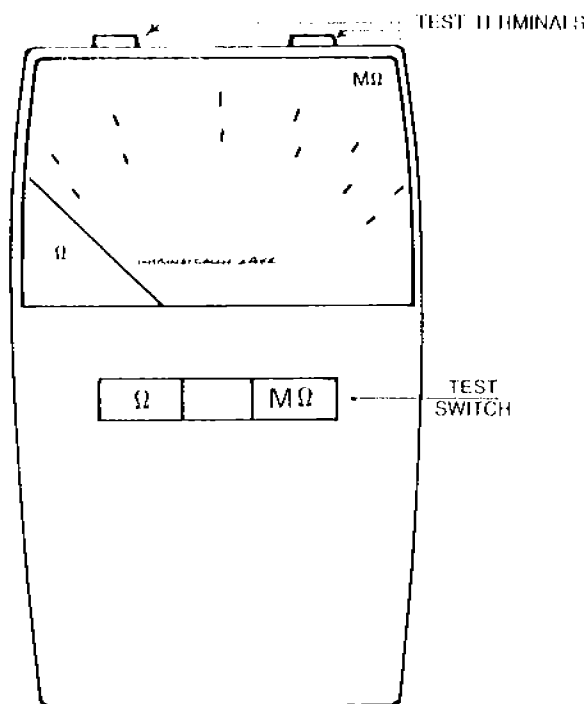


Fig. 1

Fig. 1 illustrates the front layout of a 7A501 tester.

The test switch is operated with a rocker button so that depressing and holding the left side measures continuity and depressing and holding the right side measures insulation. Readings are displayed on an analogue meter.

If the pointer deflects upscale when the test leads are connected to a circuit it indicates that the circuit is live and operating the test switch could result in damage to the tester. Disconnect the leads from the circuit.

Before using the tester check the pointer zero and the battery condition.

ZERO ADJUST

If the pointer does not coincide with the zero on the left side of the scale, adjust as required with a screwdriver inserted through the hole in the bottom of the case.

BATTERY TEST

Connect the test terminals together with the test leads and operate the right (MΩ) side of the test switch. The pointer should read zero on the top MΩ scale. If not replace the battery(ies).

BATTERY REPLACEMENT

The battery(ies) must never be replaced in a hazardous area. The carry case must first be removed by unscrewing the allen screw (with the special key provided) in the retaining strap. To access the battery(ies) remove the battery lid by undoing the screw at the rear of the tester with the special key. Remove the spent battery(ies), insert new ones and reassemble.

CONTINUITY 0-50 Ω

Continuity resistance is displayed on the meter when the left side (Ω) of the test switch is operated.

INSULATION 0-50M Ω

Insulation resistance is displayed on the meter when the right side (MΩ) of the test switch is operated.

SPECIFICATION 7A501

ELECTRICAL

Insulation MΩ

Range: 0-50 MΩ
 Test voltage: 500V DC ± 10%
 across 1MΩ
 Short circuit current: < 2mA
 Accuracy: ± 1.6mm of scale arc length

Continuity Ω

Range: 0-50 Ω
 Test voltage: Nominal 200mV
 Short circuit current: < 26mA
 Accuracy: ± 1.6mm of scale arc length

Battery:

6 off 1.5V AA IEC LR6 mang. alkaline or 1 off 9V PP7 or equivalent

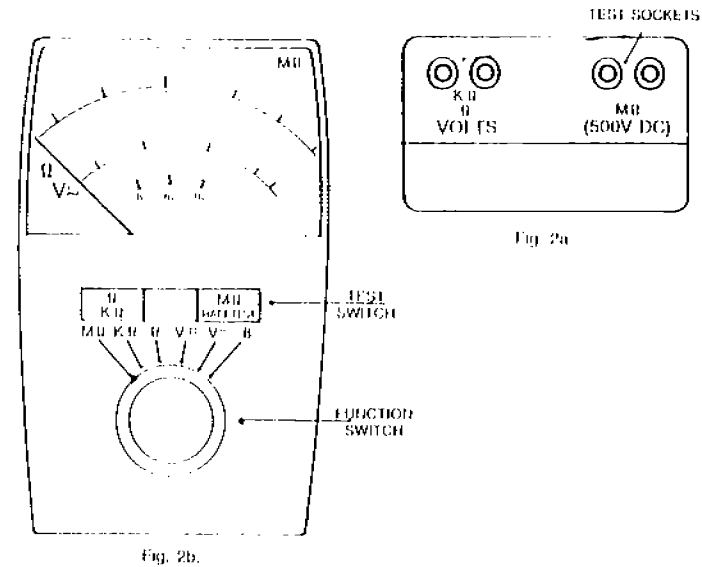
MECHANICAL

Size: 132 x 82 x 60mm
 Material: ABS
 Weight: 0.6 kg
 Movement: Nominal 1.5mA,
 sensitivity taut band
 Scale Length: 70mm
 Test leads: 914mm long with
 crocodile clips

ENVIRONMENTAL

Operating temperature: 0 to 40°C
 Storage temperature: -20°C to 60°C

OPERATING INSTRUCTIONS — MRE981



Figs. 2 a & b illustrate the terminal and front layouts of the MRE981 tester.

MRE981 TESTERS

The function switch selects insulation (MΩ), resistance (kΩ), continuity (Ω), voltage DC and AC and a battery check B. The test switch is operated with a rocker button so that depressing and holding the left side measures resistance and continuity and depressing and holding the right side measures insulation and activates the battery check. DC and AC voltages are measured without operating the test switch. Readings are displayed on a multi-scaled analogue meter.

On battery test the pointer indicates on a red/green segment on the scale. There are two pairs of test sockets which are clearly marked for kΩ, Ω and volts and for MΩ respectively.

If the pointer deflects upscale or vibrates badly when the test leads are connected to a circuit with insulation, resistance or continuity selection, do not operate the test switch at this could result in damage to the tester. Disconnect the leads from the circuit.

Before using the tester check the pointer zero and the battery condition.

ZERO ADJUST

If the pointer does not coincide with the zero on the left side of the scale adjust as required with a screwdriver inserted through the hole in the bottom of the case.

BATTERY TEST

Set the function switch to B and press the right side of the test switch. If the pointer lies in the green segment the batteries do not require changing but if the pointer lies in the red segment the batteries should be replaced.

BATTERY REPLACEMENT

The batteries must never be replaced in a hazardous area. Remove the tester from its carry case and using the special allen key provided remove the screw at the rear of the tester and lift off the battery lid. Remove the spent batteries, insert new ones and reassemble.

INSULATION 0-20 M Ω

With the test leads in the appropriate sockets and the function switch in the M Ω position insulation resistance is displayed on the meter when the right side of the test switch is operated.

RESISTANCE 0-10k Ω

With the test leads in the appropriate sockets and the function switch in the k Ω position resistance is displayed on the meter when the left side of the test switch is operated.

CONTINUITY 0-50 Ω

With the test leads in the appropriate sockets and the function switch in the Ω position resistance is displayed on the meter when the left side of the test switch is operated.

VOLTAGE 0-30V DC

With the test leads in the appropriate sockets and the function switch in the V $\overline{\text{---}}$ position DC voltage is displayed on the meter without operating the test switch.

VOLTAGE 0-30V AC

With the test leads in the appropriate sockets and the function switch in the V \sim position AC voltage is displayed on the meter without operating the test switch.

SPECIFICATION MRE981

ELECTRICAL

Insulation MΩ

Range: 0-20 MΩ
 Test voltage: 500V DC ± 10%
 across 1MΩ
 Short circuit current < 2mA
 Accuracy: ± 1.6mm of scale arc
 length

Continuity Ω

Range: 0-50Ω
 Test voltage: Nominal 200mV
 Short circuit current < 26mA
 Accuracy: ± 1.6mm of scale arc
 length

Resistance Ω

Range: 0-10kΩ
 Test voltage: Nominal 2V
 Short circuit current < 1.5mA
 Accuracy: ± 1.6mm of scale arc
 length

Voltage DC/AC V

Range: 0-30 volts
 Accuracy: ± 3.5% of full scale
 above 5 volts.

Battery: 6 off 1.5V AA IEC
 LR6 mang. alkaline

MECHANICAL

Size: 132 x 82 x 60mm
 Material: ABS
 Weight: 0.6 kg
 Movement: Nominal 1.5mA,
 sensitivity taut band

Scale Length 70mm
 Test leads: 914mm long with
 crocodile clips

ENVIRONMENTAL

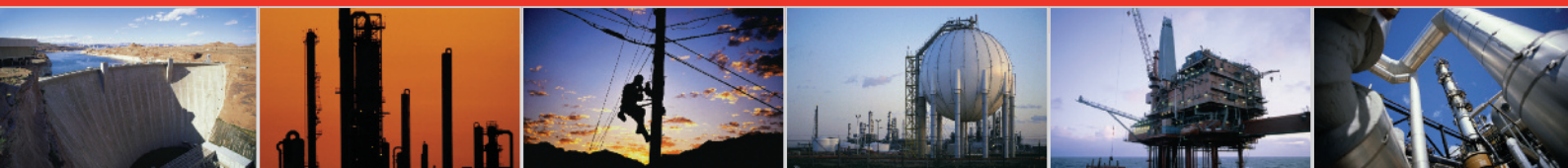
Operating temperature: 0 to 40°C
 Storage temperature: -20°C to 60°C

**SPARES AND ACCESSORIES
 (7A501 AND MRE981)**

Leads: PA28182 A&B
 Carry Case: 7A501 PA24249/A
 Carry Case: MRE981 PA28542A
 Battery: 1.5V IEC LR6
 MN1500 Size AA
 mang. alkaline CEJ0006
 9V PP7 or
 equivalent S6782

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