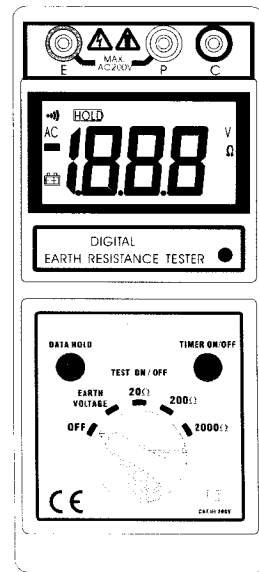


DIGITAL EARTH RESISTANCE TESTER



INSTRUCTION MANUAL

K20

Index	Page
Introduction	1
Safety Notes	2
Features	3
Specifications	4-5
Measuring Methods	6-7
Maintenance	8

1. Introduction

NOTE

This meter has been designed and tested according to IEC Publication 348. Safety Requirements for Electronic Measuring Apparatus. IEC-1010(EN 61010) and other safety standards. Follow all warnings to ensure safe operation.

WARNING !

READ "SAFETY NOTES" (PAGE 2) BEFORE USING THE METER.

2. Safety Notes

- Read the following safety information carefully before attempting to operate or service the meter.
- Use the meter only as specified in this manual : otherwise the protection provided by the meter may be impaired.
- Rated environmental conditions :
 - (1). Indoor use.
 - (2). Installation Category III 200V .
 - (3). Pollution Degree 2.
 - (4). Altitude up to 2000 Meter.
 - (5). Relative Humidity 80% Max.
 - (6). Ambient Temperature 0~40°C .
- Observe the International Electrical Symbols listed below.



Meter is protected throughout by double insulation or reinforced insulation.



Warning ! Risk of electric shock.



Caution ! Refer to this manual before using the meter.

3. Features

- Capable of measuring earth voltage.
- 2mA measuring current permits earth resistance tests without tripping earth leakage current breakers in the circuit under test.
- In addition to facility for precision measurement, test leads for simplified two wire measuring system also supplied as standard accessories.
- Data hold function.
- Battery operated.
- Battery life indicator.
- Designed to meet IEC-1010(EN 61010) safety standard.
- Timer for test function (count 3~5 minutes)

4. Specifications

- Measurement System :
Earth resistance by constants current inverter 820 Hz, 2 mA approx.
- Earth voltage : 0~199.9 V AC, 40~500Hz.
- Earth resistance :
Range and resolution
0 ~ 19.99 Ω (0.01 Ω)
0 ~ 199.9 Ω (0.1 Ω)
0 ~ 1999 Ω (1 Ω)
- Accuracy :
Earth resistance : $\pm(2\% \text{ rdg} + 2\text{dgt})$ or $\pm 0.1\Omega$, which is grater.
Earth voltage : $\pm 1\% \text{ rdg} \pm 2\text{dgt}$.
- Safety standard :
IEC-1010(EN 61010), Installation Category III 200V.
- Low battery indication :
" : : " symbol appears on the display.
- Data hold indication :
" **HOLD** " symbol appears on the display.
- Over range indication :
" 1 " (MSD).
- Display :
LCD 3 1/2 digit (2000 counts).
- Power source :
1.5V(R6P) x 6 pieces or equivalent.
- Dimensions :
205(L) x 90(W) x 55(D) mm.
- Weight :
Approx. 572g (battery included).
- Accessories :
Test leads(red-15M, yellow-10M, green-5M). Auxiliary earth spikes,
Simplified measurement probe, instruction manual.

5. Measuring Methods

BEFORE PROCEEDING MEASUREMENT, READ SAFETY NOTES ON PAGE 2.

1. In proceeding with measurement, if " " symbol appears on the display, replace with new batteries.
2. Rotary to function switch to "EARTH VOLTAGE" position and press to test. Earth voltage will displayed on the LCD. When earth voltage is more than 10V, it may result in errors in earth resistance measurement. Accurate earth resistance measurement may not be made.

3. 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 the function switch to suitable range then press the pushbutton to test and take the reading.

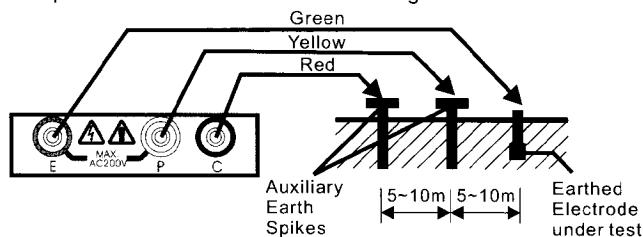


Fig.1

4. Simplified earth resistance measurement method :

- (1) This method is recommended where an earth resistance higher than 10Ω is measured or where it is not possible to drive auxiliary earth spikes. An approximate value of earth resistance can be obtained by the two wire system where is shown in fig.2.
- (2) Rotary to function switch to "EARTH VOLTAGE" position and press to test. Make certain that earth voltage is less than 10V.

-6-

- (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 (R_x) is an approximate earth resistance value. There is no need for external shorting as P and C terminals are shorted by using the test leads specified for the simplified Measurement.

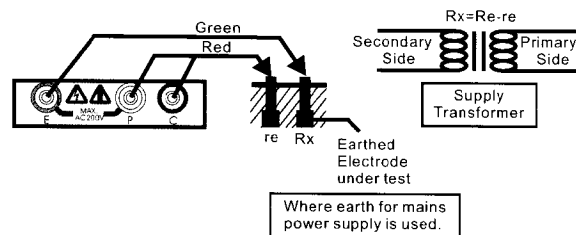


Fig.2


- (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 2mA, the earth leakage 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) indicator will lit. This proves a correct current circulation is under its operation.

-7-

6. Maintenance

- 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) Use a screwdriver to unscrew the screws on back cover then slide the cover, take out the batteries and replace with new batteries type SUM-3.
- (3) Place back cover and secure bay 2 screws.

- 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