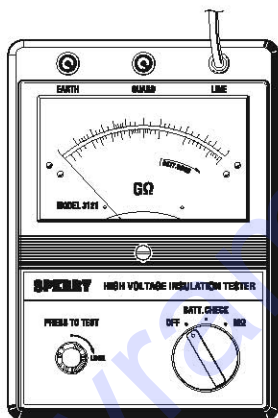


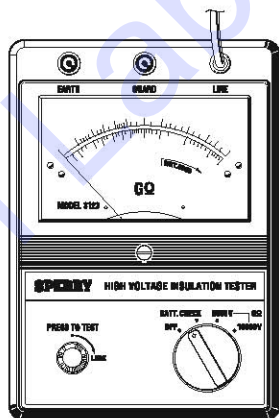
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FORM#341

# OPERATING INSTRUCTIONS



Model-3121 · 3122



Model-3123

## HIGH VOLTAGE INSULATION TESTER MODEL 3121 · 3122 · 3123



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## 1. Features

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- Battery powered, the instruments test insulation up to  $1000000\text{M}\Omega$  at  $2500\text{V}$  for Model 3121,  $200000\text{M}\Omega$  at  $5000\text{V}$  for Model 3122 and  $200\text{G}\Omega$  at  $5000\text{V}$  and  $400\text{G}\Omega$  at  $10000\text{V}$  for Model 3123.
- Suited for heavy duty electrical maintenance and servicing of industrial installations, cables, transformers, generators and switchgear where high voltage insulation tests are required.
- Dual scales for low and high ranges which change automatically. Colour coded scales for easy reading plus LED's that illuminate in matching colour.
- Drip proof construction. The case is sealed with rubber gaskets to protect internal circuit against rain.
- Hard carrying case furnished as standard accessory. Houses both instrument and test leads in compact form. Made of plastic, it is highly water resistant.
- Designed for low power consumption. Since the maximum current consumption is  $90\text{mA}$  eight pieces of  $1.5\text{V SUM-3}$  (or equivalent ) permit about 6 hours of continuous operation even when the instrument is used on maximum load or twice longer on minimum load.
- Rated output voltage is maintained down to  $100\text{M}\Omega$  for Model 3121,  $200\text{M}\Omega$  for Model 3122 and  $0.2\text{G}\Omega/0.4\text{G}\Omega$  for Model 3123. This permits accurate measurements of low insulation resistance.

## 2. Specifications

		Model 3121	Model 3123
DC Test Voltage		2500V	5000V
Measuring Ranges		0~2000M $\Omega$ / 1000~10000M $\Omega$ (automatic change)	0~5000 M $\Omega$ / 2000~20000 M $\Omega$ (automatic change)
Accuracy	Insulation Resistance	$\pm 5\%$ of reading (100~50000M $\Omega$ ) $\pm 10\%$ of reading or 0.5% of scale length (ranges other than listed above) at 23°C $\pm 5^\circ$ C $\pm 10\%$ of reading (100~50000M $\Omega$ ) $\pm 20\%$ of reading or 1.0% of scale length (ranges other than listed above) at $-10^\circ$ C~ $+4^\circ$ C	$\pm 5\%$ of reading (200~10000M $\Omega$ ) $\pm 10\%$ of reading or 0.5% of scale length (ranges other than listed above) at 23°C $\pm 5^\circ$ C $\pm 10\%$ of reading (200~10000M $\Omega$ ) $\pm 20\%$ of reading or 1.0% of scale length (ranges other than listed above) at $-10^\circ$ C~ $+4^\circ$ C
	Output Voltage	2500V $\pm 5\%$ (100~50000M $\Omega$ )	5000V $\pm 5\%$ (200~10000M $\Omega$ )
Operating Temperature & Humidity		$-10^\circ$ C ~ $+40^\circ$ C	
Storage Temperature & Humidity		$-20^\circ$ C ~ $+60^\circ$ C	
Insulation Resistance		1000M $\Omega$ max./1000V	
Withstand Voltage		5000V AC for one minute	
Dimensions		200mm x 100mm x 40mm	
Weight		Approx. 1.1kg	
Power Source		8 pcs of 1.5V	
Accessories		Hard Carrying Case, Battery	

Model	3122	Model 3123	
	V	5000V	10000V
00 MΩ/ ~ 200000MΩ change)		0~5GΩ/2~200GΩ (automatic change)	0~10GΩ/4~400GΩ (automatic change)
of reading ~ 100000MΩ)		±5% of reading (0.2~100GΩ)	±5% of reading (0.4~200GΩ)
of reading of scale length es other than ed above)		±10% of reading or 0.5% of scale length ( ranges other than listed above)	±10% of reading or 0.5% of scale length ( ranges other than listed above)
±5°C		at 23°C ±5°C	at 23°C ±5°C
of reading ~ 100000MΩ)		±10% of reading (0.2~100GΩ)	±10% of reading (0.4~200GΩ)
of reading of scale length es other than ed above)		±20% of reading or 1.0% of scale length ( ranges other than listed above)	±20% of reading or 1.0% of scale length ( ranges other than listed above)
°C ~+40°C		at -10°C~+40°C	at -10°C~+40°C
/ ±5 ~ 100000MΩ)		5000V ±5% (0.2~100GΩ)	10000V ±5% (0.4~200GΩ)
°C ~+40°C at 85% max. relative humidity			
°C ~+60°C at 90% max. relative humidity			
/ 1000V between electrical circuit & housing case			
ne minute between electrical circuit & housing case			
200(L)×140(W)×80(D)mm			
. 1kg (including batteries & line probe)			
of 1.5V SUM-3 battery or equivalent			
e, Batteries, Test Leads (earth & guard leads)			

(Optional adaptor model 8020 is available for connection to recorder)

### 3. Instrument Layout

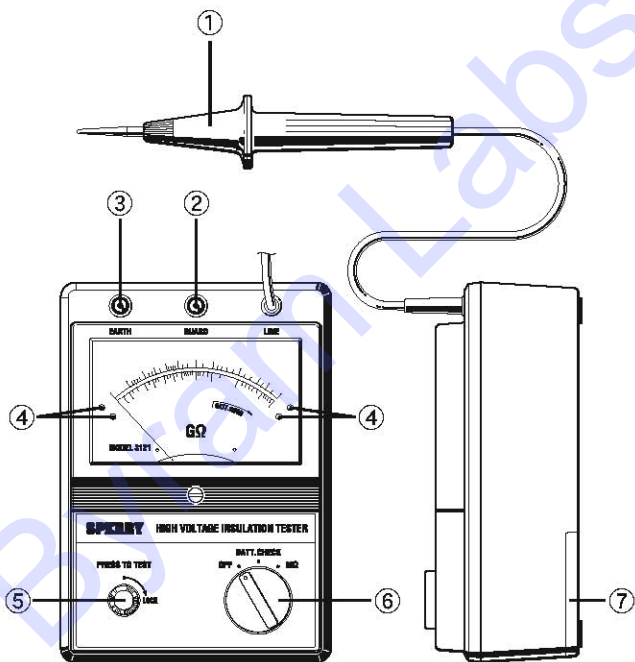


Fig.1

- |                        |   |
|------------------------|---|
| ① Line Probe           | ② Guard Terminal                        |
| ③ Earth Terminal       | ④ LED's for High & Low Range Indication |
| ⑤ Press to Test Button | ⑦ Battery Compartment Cover             |
| ⑥ Function Switch      |   |

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## 4. Operating Instructions

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### CAUTION:

BE CAREFUL ABOUT HIGH VOLTAGE PRESENT ACROSS LINE AND EARTH TERMINALS OF INSTRUMENT WHEN PRESS TO TEST BUTTON IS OPERATED. MAKE SURE TO EARTH CIRCUIT UNDER TEST. ALWAYS CONNECT EARTH TERMINAL OF INSTRUMENT TO EARTH. THE BUZZER WILL KEEP SOUNDING DURING INSULATION RESISTANCE MEASUREMENT.

### 4-1. Mechanical Zero Adjustment

With the function switch set at OFF position, adjust the meter pointer to “∞ mark ” on the scale. Use a screwdriver to turn the zero adjust screw located at the center of the front panel.

### 4-2. Battery Check

With the function switch set at BATT. CHECK position, operate the press to test button. The batteries are good when the pointer stays in BATT. GOOD area or to the right of this area. If not, replace them.

**Note:** Refrain from holding down or locking the press to test button during this as it will result in current consumption larger than insulation resistance measurement while the batteries are still new.

### **4-3. Insulation Resistance Measurement**

With the function switch set at OFF position, always connect the circuit under test to earth. Attach the test lead to the earth terminal of the instrument and connect to the earthed side of the circuit under test. With the function switch set at  $M\Omega$  position for Model 3121 and 3122 or  $G\Omega$  position for Model 3123, place the line probe in contact with the circuit under test and operate the press to test button. When the green LED illuminates, read insulation resistance on the outer scale (for high range). Use the inner scale where the red LED illuminates. For insulation testing at 5000V and 10000V, read the black and red scales respectively (for Model 3123). After a test, release the press to test button and wait for several seconds without disconnecting the line probe from the circuit tested. This is intended to discharge the charge stored in the circuit tested.

### **4-4. Continuous Measurement**

Make sure that the circuit under test is earthed and that the test lead attached to the earth terminal of the instrument is connected to the earthed side of the circuit under test. Push the press to test button and turn clockwise to lock for continuous measurement. When making this measurement, good care must be taken against the high voltage continuously present across the line and earth terminals of the instrument.

**Note: Make certain that the circuit under test does not include components which will be damaged by the high voltage applied.**

#### 4-5. Use of Guard Terminal

Illustrated in Fig. 2 is an example of the insulation resistance measurement of an electric wire. If the line probe is simply connected to the wire conductor and the earth lead to the immersion liquid container as shown, a measurement error will be introduced as this results in the measurement of the combined resistance of insulation resistance and the surface leakage resistance at the cut end of the electric wire. In order to remove this surface leakage current, wide a guard wire around the cut end of the conductor and connect it to the guard terminal of the instrument using the guard lead. Then, the surface leakage current will bypass the indicating meter of the insulation resistance tester.

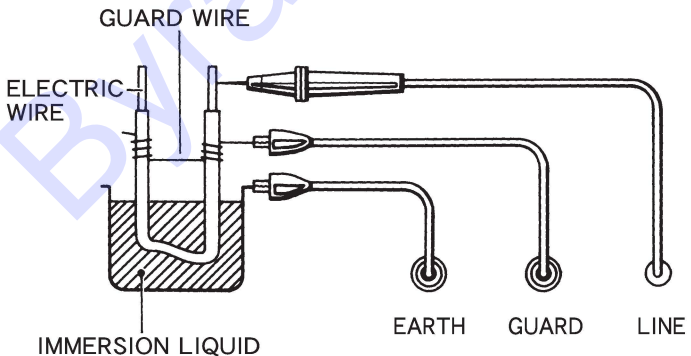


Fig.2

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## 5. Battery Replacement

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Remove the battery compartment cover by loosening the screw located on the back of the housing case. Replace the whole battery pack. Alkaline batteries are recommended where the instrument is used at a temperature below the freezing point. The ordinary manganese batteries will deteriorate below the freezing point.

(For your information, optional adaptor Model 8020 is available to allow Model 3121,3122 and 3123 to be connected to a recorder for recording insulation resistance. It provides an output signal of  $1 \mu\text{A}/10\text{mV DC}$ .)

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## 6. Cleaning Meter Cover

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Do not try to remove dirt on the meter cover by rubbing hard with a dry cloth. This can remove anti-electrostatic agent applied to the surface of the surface of the meter cover.

When the meter reading is affected by electrostatic build up on the meter cover, wipe the meter cover surface using a cloth dampened with off-the shelf anti-static agent or detergent.

To avoid possible deforming or discoloring, do not use solvents.

To clean the body of the instrument, use cloth dampened with detergent.

### **⚠ CAUTION**

Never use paint thinner, benzene or other solutions containing solvents for cleaning the instrument.

Otherwise, deforming or discoloring of the instrument body or the meter cover may result.

### **Note:**

**Handle the instrument with care and follow the instructions in order to maintain it in good condition for a long period of time.**