SAFETY INFORMATION

INTRODUCTION
Thank you for purchasing a SANWA tester Model YX360TRF. You are kindly requested to thoroughly read this manual before use for safety.

Especially, “SAFETY INFORMATION” and “MEASURING PROCEDURE” are important. Keep this manual together with the tester so as no to lose it.

The following are precautions to prevent accidents such as electrical shocks. Be sure to read them before using the tester.

Symbols
The following cautionary signs appear on the multitester and in this manual. Disobedience to instructions with this sign ... parts marked with it.

1. Symbols
1. (exclamation point) This sign cautions that high voltage is applied to parts marked with it.

2. Precautions for Safety Measurement
1. Before starting measurement, make sure that the function and range are properly set in accordance with the measurement.
2. Never use the meter with wet hands or in a damp environment.
3. Never use test leads other than the specified type.
4. Calibrate and check the meter at least once a year.

3. Indoor use only.

4. Never use the meter for measuring the line connected with equipment other than electrical circuits.
5. Never use the meter if the meter or test leads are damaged or broken.
6. Never use an uncased meter.

5. Use of Cover (example for the body cover)
When this tester is out of use: Attach the cover to the panel face for safekeeping.
When measuring: Attach it either to the rear case side or use it as a stand as shown below.

6. Use of Cover, Test Leads, Hand Strap

7. Be sure to use a fuse of the specified rating or type. Never use a substitute of the fuse or make a short circuit of the fuse.
8. Always keep your fingers behind the finger guards on the probe when making measurements.
9. Be sure to disconnect the test pins from the circuit when changing the function or range.
10. Before starting measurement, make sure that the function and range are properly set in accordance with the measurement.
11. Never use the meter with wet hands or in a damp environment.
12. Never use test leads other than the specified type.
13. Never open the case except when replacing batteries or fuses. Do not attempt any alteration of original specifications.
14. To ensure safety and maintain accuracy, calibrate and check the meter at least once a year.

15. Use the optional probe.

APPLICATION

This instrument is portable multitester designated for measurement of weak current circuits.

The specifications described in this manual are subject to change without notice.

Note: The definition of installation category, e.g. CAT II : Local level, appliances, portable equipment etc., with smaller transient overvoltages than installation category III.
CAT III : Distribution level, fixed installation, with smaller transient overvoltages than installation category IV.

APPLICATION

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SAFETY INFORMATION

WARNING
To ensure that the meter is used safely, follow all safety and operating instructions.

1. Never use the meter on the electric circuits that exceed 3kV.
2. Pay special attention when measuring the voltage of AC 33 Vrms (66.4V peak) or DC 70V or more to avoid injury.
3. Never apply input signals exceeding the maximum rating input value.
4. Never use the meter for measuring the line connected with equipment (i.e. motors) that generates induced or surge voltage since it may exceed the maximum allowable voltage.
5. Never use the meter if the meter or test leads are damaged or broken.
6. Never use an unearned meter.

SPECIFICATIONS

1. General Specifications

2. Scale Reading

3. Measurement Range and Accuracy

<table>
<thead>
<tr>
<th>Function</th>
<th>Full scale value</th>
<th>Accuracy</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCV</td>
<td>±250X ±10X</td>
<td>±5%</td>
<td>±5%</td>
</tr>
<tr>
<td>ACV</td>
<td>±750X ±100X</td>
<td>±5%</td>
<td>±5%</td>
</tr>
<tr>
<td>FE</td>
<td>±250X ±100X</td>
<td>±5%</td>
<td>±5%</td>
</tr>
<tr>
<td>LV</td>
<td>±5X ±1X</td>
<td>±5%</td>
<td>±5%</td>
</tr>
</tbody>
</table>

4. Measurement Range and Accuracy

5. Specifications

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MEASURING PROCEDURE

MEASURING DCV
1. Set the range selector knob to an appropriate DCV range.
2. Apply the test lead to the negative potential, and the red test lead to the positive potential of the circuit.
3. Read the movement of the pointer.

MEASURING ACV ±
1. Turn the range selector knob to an appropriate ACV range.
2. Apply the test leads to the circuit to be measured.
3. Read the movement of the pointer by V and A scale.

WARNING
Do not measure the voltage in a circuit where a voltage is present.

USING DCV (NULL)
1. Set the range selector knob to an appropriate ±DCV (NULL) range.
2. Turn the 0Ω adjuster so that the pointer may align exactly to 0 by ±DCV scale.
3. Read the black test lead to the negative potential side, and the red test lead to the positive potential side of the circuit.
4. Read the movement of the pointer by ±DCV scale.

MEASURING ACV ±
1. Turn the range selector knob to an appropriate ACV range.
2. Apply the test leads to the circuit to be measured.
3. Read the movement of the pointer by V and A scale.

MEASURING DCA ±
Connect the meter in series with the load.
1. Turn the range selector knob to an appropriate DCA range.
2. Take out the circuit to be measured and apply the black test pin to the negative potential, and the red test pin to the positive potential of the circuit.
3. Read the movement of the pointer by DCA scale.

WARNING
Connect the meter in series with the load.

MEASURING OF IECO (Leak Current) for Transistor
1. Adjust Q0 by setting the range selector knob to a proper range from X1 ~ X1k.
2. For NPN transistor, apply a black test lead to the collector and a red one to the emitter.
3. For PNP transistor, the red one to the collector and the black one to the emitter.
4. Determine the leakage current by IECO scale indicated on the scale plate. (Unit in μA, mA)

MEASURING OF DIODE (including LED)
1. Adjust Q0 by setting the range selector knob to a proper range from X1 (150μA) ~ X10k (1.5mA).
2. Apply the black test lead to anode side and the red one to cathode side when measuring IR (reverse current). Apply the black test lead to cathode side and the red one to anode side when measuring IF (forward current).
3. Read the indicated value by LI scale. (The point becomes to a considerable extent for IR, and little extent for IR)
4. The value indicated on LV scale during the measurement is the forward voltage of diode.

MEASURING OF HIGH VOLTAGE PROBE (HV-10T)
Up to DC 25kV of CRT anode voltage can be measured by connecting optional HV-10T probe.

1. Set the range selector knob to X10 range (hFE).
2. Connect the black test pin to the probe jack when a transistor to be measured is NPN, and the red pin to the probe jack for PNP transistor.
3. During the measurement of voltage, the black clip of the probe to the transistor base and the red clip to the collector.
4. Connect the remaining test lead to the emitter and measure the voltage.
5. Read the indicated value of the meter on hFE scale.

WARNING
Avoid using the meter any excessive shock or vibration by loading it on the motorbike, for instance.

How to Replace the Fuse
1. Loosen the screws fixing the rear case and remove it.
2. Replace the fuse (3A) to fresh dry battery.
3. Put back the rear case where it was, and fix it with the screws.

MAINTENANCE

Storage and Other Precautions
1. Avoid storing the meter in places of a high temperature (higher than 55°C), a high humidity (higher than 80%), and dew condensation.
2. The meter cover is treated with antistatic coating. Do not wipe it hard or clean it with volatile solvent. Use a soft brush to remove dust.

USING OF OPTIONAL PROBES

1. Usage of hFE PROBE (HFE-6T)
2. Usage of Probe for CRT HV-10T
3. Usage of Probe for CRT HV-10T
4. Usage of Probe for CRT HV-10T
5. How to Replace the Fuse
6. Usage of Probe for CRT HV-10T

7. How to Replace the Fuse
8. Usage of Probe for CRT HV-10T
9. Usage of Probe for CRT HV-10T

AFTER - SALES SERVICE

Warranty and Provision
Under Sanwa’s general warranty policy, each instrument is warrantied to be free from defects in workmanship or material under normal use for the period of 1 year from the date of purchase. This warranty policy is valid within the country of purchase only, and applies only to the product purchased from Sanwa authorized agent or distributor. This warranty does not apply to fuses, disposables batteries, or any product or parts, which have been subject to one of the following causes:
1. A failure due to improper handling or use that deviates from the instruction manual.
2. A failure due to inadequate repair or modification by people other than Sanwa service personnel.
3. A failure due to causes not attributable to this product such as fire, flood and other natural disaster.
4. A failure due to causes attributable to this product such as fire, flood and other natural disaster.
5. A failure or damage due to transportation, relocation or dropping after the purchase.

Repair
Please contact Sanwa authorized agent/distributor/service provider, listed in our website, in your country with your information.

SANWA web site
http://www.sanwa-meter.co.jp
E-mail: exp_sales@sanwa-meter.co.jp