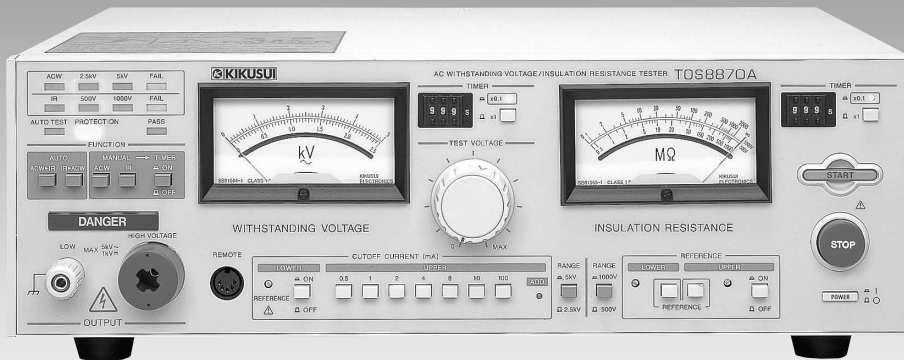


WITHSTANDING VOLTAGE AND INSULATION RESISTANCE TESTER

NEW



Capable of Performing Continuous Withstanding Voltage Test and Insulation Resistance Test

Outline

TOS8870A is a combination of a withstanding voltage tester and an insulation resistance tester, and it is capable of performing Withstanding Voltage Test and Insulation Resistance Test in one continuous process.

(Choice of setting arrangement: AUTO ACW→IR, AUTO IR→ACW, MANU.ACW, MANU.IR.)

The Tester can provide a maximum output of 5kV and an output capacity of 500VA (AC), and can be used for withstanding voltage test for the electrical equipment and components in compliance with major electrical standards and ordinances. As for the insulation resistance tester, the tester has two ranges of 500V/1000MΩ and 1000V/2000MΩ.

Features

- Capable of performing withstanding voltage test and insulation resistance test in one continuous process.
- Withstanding Voltage Tester : Maximum Output AC 5kV/100mA and Output Capacity 500VA
- Insulation resistance in 2 ranges: 500V/1000MΩ and 1000V/2000MΩ
- Voltmeter : JIS class 1, Accuracy : ±1.5% f.s
- GO-NOGO judgment with a window comparator type
- Remote control function
- PASS, FAIL contact signal output
- Equipped with Digital Timer : 0.2sec to 99.9sec/1sec to 999sec
- Downsized approximately 30% in volume (compared to the existing type)

Performance & Function

■ Complies with of the Safety Standards

As for the withstanding voltage tester, the Tester can provide a maximum output voltage of 5kV and an output capacity of 500VA, and identical for withstanding voltage test in compliance with JIS, UL, CSA, BS and other major electrical standards and ordinances.

And as for the insulation resistance tester, it has two ranges of 500V/1000MΩ and 1000V/2000MΩ.

■ Safety Features

The output terminals are designed to limit the size of holes for preventing inserting fingers.

To ensure the safety of operators, the tester is provided with an interlock function that cuts off the power in cooperation with an external device.

■ Equipped with Discharge Circuit

In insulation resistance tests, the DUT are charged with high voltage that contains capacitive element and remain the charged state even after the power has been turned off, and it may cause electric shock accident. This tester is provided with discharge circuit that will activate to discharge forcibly when the power is turned off as completion of insulation resistance test.

■ Compact Size

Pursuing the design of "easy to use" and "safety", the volume of unit has been drastically downsized about 30% compared to the existing model by excellent package features without spoiling any basic specifications. This fact shall contribute the improvement of effectiveness for the Rack Mounting arrangement and saving the volume of space.

TOS8870A

WITHSTANDING VOLTAGE AND INSULATION RESISTANCE TESTER

Specifications

Withstanding Voltage test mode

| | | |
|--|--|--|
| Test Voltage | Output AC Voltage | 0 V to 2.5 kV/0 V to 5 kV (two ranges) |
| | Output Rating | 500 VA (5 kV, 100 mA with 100 V line voltage) *1 |
| | Waveform | AC line waveform |
| | Voltage regulation | Better than 20% (for maximum rated load to no load, with 100 V line voltage) |
| | Switching | With zero-start type switch |
| Output Voltmeter | Scales | 2.5 kV f.s / 5 kV f.s, two ranges linear scales |
| | Class of meter | JIS Class 1 |
| | Accuracy | 5 °C to 15°C : ±3 % f.s 15 °C to 35 °C : ±1.5 % f.s (with a sine wave) *2 |
| | Indication | Mean-value response, effective-value scale graduation |
| Judgment of Test Result PASS-FAIL judgment. Output cutoff by leakage current detection | Judgment | Window comparator system FAIL judgment when leakage current larger than high limit reference value is detected. FAIL judgment also when leakage current smaller than low limit reference value is detected. When FAIL judgment is made, output is cutoff and FAIL alarm is generated. If no FAIL judgment is made after preset period has elapsed, PASS signal is generated. |
| | High limit reference value | 0.5/1/2/4/8/10/100 mA (7 values) By combinations of above values, a range of 0.5 mA to 25.5 mA can be covered in 0.5 mA steps. |
| | Low limit reference value | 0 to one-half of high limit reference values (continuously variable) |
| | Accuracy of judgment *3 | ±5 % of high limit ±20 % of low limit reference value (one-half of high limit reference values at maximum counterclockwise). (Other are non-calibrated.) |
| | Judging method | Absolute value of leakage current is integrated and compared with preset limit reference value |
| | Calibration | Calibrated with rms value of sine wave, using a pure resistance load. |
| | No-load output voltage need for detection *4 | 2.5 kV range Approx. 450 V when set at 100 mA 5 kV range Approx. 550 V when set at 100 mA |
| | Test time | Timer :0.2 s to 99.9 s (× 0.1 range) ±50 ms 1 s to 999 s (× 1 range) ±0.5 s |
| Others | Terminals for monitoring of leakage current | |

*1. The heat radiation of the output section of the tester is designed to be 1/2 of the rated output, taking the size, weight, cost, etc., into consideration. Therefore, use it within the limitations shown in Table 1. If it is used in excess of these limitations, the temperature of the output section rises excessively and the internal protection circuit may be activated. In this case, cancel the test for a while and wait until the normal temperature is restored.

*2. Crest factor of 1.35 to 1.41, distortion of 3% or less

*3. The current which flows due to stray capacitances of the output circuit and leadwires causes an error. The overall accuracy of judgement is the above-mentioned accuracy of judgement plus a factor caused by this current. Typical values of this type of currents are shown in the Table 2. Note that, when a test is made with a high voltage and high sensitivity, the current which flows through the stray capacitances may become larger than the preset low limit reference value and low limit judgement may become unavailable.

*4. When making a FAIL judgement test with the output terminals shorted, a certain level of no-load output voltage is needed due to the internal resistance of the output circuit. The voltages shown here are this type of output voltages.

[Table 1.]

| Ambient temperature | Test current I | Pause time | Maximum test time |
|---------------------|----------------|---------------------|--------------------------|
| t ≤ 40 °C | 25.5 < I ≤ 100 | Test time or longer | 30 minutes or less |
| | I ≤ 25.5 | Not required | Continuous test possible |

Test Voltage Waveform

When an AC output voltage is applied to a capacitive load, it is possible that the voltage becomes higher than when in the no-load state due to the capacitance of the load. Moreover, when the capacitance of the load is voltage dependent (typical examples are ceramic capacitors), the voltage waveform may be distorted. When the test voltage is 1.5kV, however, effects caused by a capacitance of 1000pF or less are negligible.

[Table 2.]

| Output voltage | 1 kV | 2 kV | 3 kV | 4 kV | 5 kV |
|---|-------|-------|-------|-------|--------|
| Test alone (without leadwires) | 4 μA | 8 μA | 12 μA | 16 μA | 20 μA |
| When 350mm long leadwires are hung in air | 6 μA | 12 μA | 18 μA | 24 μA | 30 μA |
| When the accessory leadwire (TL01-TOS) are used | 20 μA | 40 μA | 60 μA | 80 μA | 100 μA |

Insulation resistance Tester

| | | |
|---|---|---|
| Measuring Voltage | 500 V or 1 000 V DC, negative polarity (two ranges) | |
| Measuring terminal voltage | 0% to + 5% of rated measuring voltage (At rated measuring current or less) | |
| Output current | Rated measuring current | 1.0 mA |
| | Short circuit current | 12 mA or less |
| Effective Measuring Ranges | 500 V range | 1 MΩ to 1 000 MΩ |
| | 1000 V range | 2 MΩ to 2 000 MΩ |
| Values center of scale | 500 V range | 20 MΩ |
| | 1000 V range | 50 MΩ |
| Accuracy | 1st effective measuring range : ±5 % of the indicated value *1 2nd effective measuring range : ±10 % of the indicated value *1 | |
| Judgment of Test Result PASS-FAIL judgment | Judgment | Window comparator system (mutually independent settings of high limit and low limit) FAIL judgment when measured resistance is smaller than low limit reference value. FAIL judgment when measured resistance is larger than high limit reference value. When FAIL judgment is made, output is cutoff and FAIL alarm is generated. If no FAIL judgment is made after preset period has elapsed, PASS signal is generated. |
| | Limit reference value setting range | Low and high limit reference values can be set at any points within the effective measuring range of the Tester. |
| | Accuracy of judgment | 1st effective measuring range : ±10 % of set value *1 2nd effective measuring range : ±15 % of set value *1 |
| | Waiting-time for judgment | Approx. 0.3 s |
| Test time | Timer :0.5 s to 99.9 s (× 0.1 range) ±50 ms 1 s to 999 s (× 1 range) ± 0.5 s | |

*1. At 25 °C ± 10 °C

The 1st effective measuring range is from 1/1000 to 1/2 of the maximum effective scale value. The 2nd effective measuring range is from the above to the maximum effective scale value.

WITHSTANDING VOLTAGE AND INSULATION RESISTANCE TESTER

Common Specifications

| | | | |
|--|---|--|--------------------------------------|
| Types of test | 1.AUTO ACW→IR | Withstanding voltage test first and insulation resistance test next | |
| | 2.AUTO IR→ACW | Insulation resistance test first and withstanding voltage test next | |
| | 3.MANUAL ACW | Withstanding voltage test alone | |
| | 4.MANUAL IR | Insulation resistance test alone | |
| Remote Control | Test / Reset control | Low active control Input conditions *1 High level input voltage 11 V to 15 V Low level input voltage 0 V to 4 V Low level sweep out current 5 mA or less Input pulse width 20 ms minimum | |
| | Interlock | Protection is effected when INTERLOCK terminal is made open (test is disabled). | |
| Output signals *2 | Signal Name | Conditions for Signal Generation | Type of Signals |
| | TEST ON signal | Delivered during entire test-on period. | Make-contact signal and lamp |
| | PASS signal | Delivered when PASS judgment is made, for approximately 50 ms. | Make-contact signal, lamp and buzzer |
| | ACW/FAIL alarm | Delivered continuously when FAIL judgment of withstanding voltage test is made. | Make-contact signal, lamp and buzzer |
| | IR/FAIL alarm | Delivered continuously when FAIL judgment of insulation resistance test is made. | Make-contact signal, lamp and buzzer |
| | READY signal | Delivered when in the READY state. | Make-contact signal |
| Special Test Mode <small>Selectable with DIP switches at rear of Tester</small> | 1.DOUBLE ACTION | Test starts only when the START switch is pressed within approximately 0.5 s after pressing the STOP switch. | |
| | 2.PASS HOLD | The PASS state is held. | |
| | 3.MOMENTARY | Test is executed only during the period the START switch is kept pressed. | |
| | 4.FAIL ALARM | FAIL alarm and PROTECTION state cannot be reset by the remote-control STOP signal. | |
| Ambient Temperature and Humidity | Warranty | 5 °C to 35°C /20 % to 80 % RH | |
| | Operable range | 0 °C to 40 °C /20 % to 80 % RH | |
| | Storage range | -20 °C to 70 °C /80 % RH or less | |
| EMC | Complied with the following standards IEC61326 EMISSION Class A Immunity Minimum Requirements Under following conditions 1. Used HV test leadwire TL01-TOS. 2. No discharge in testing. | | |
| Safety | Complied with the following standards IEC61010-1 Overvoltage category II Pollution degree 2 | | |
| Power Requirements | Line voltage | 100 VAC ± 10 %, 50/60 Hz *3 | |
| | Power consumption | When no load (RESET state) : 15 VA or less *4 When with rated load : Approx. 600 VA | |
| | Insulation resistance | 30 MΩ or more, 500 VDC | |
| | Withstanding voltage | 1350 VAC, 1 minute | |
| Dimensions (maximum) | 430 (435) W x 132 (155) H x 370 (440) Dmm | | |
| Weight | Approx. 23 kg | | |
| Standard accessories | TL01-TOS High Voltage Test Leadwires, approx. 1.5 m long. 1 AC Power cable 1 Operation Manual 1 | | |
| Options | RC01-TOS Remote Control Box | | |
| | RC02-TOS Remote Control Box | | |
| | HP01A-TOS High Voltage Test Probe, approx. 1.5 m long | | |
| | HP02A-TOS High Voltage Test Probe, approx. 3 m long | | |
| | TL02-TOS High Voltage Test Readwires, approx. 3 m long | | |
| | KRB150-TOS Rackmount Bracket (for JIS) | | |
| KRB3-TOS Rackmount Bracket (for EIA) | | | |

*1. The input terminal is pulled up to +15V supply voltage by resistor. Opening of the input terminal is equivalent to a high level input.

*2. The rating of the signal contacts is 125VAC, 1A, or 30VDC, 1A.

Loudness of the buzzer is adjustable with a knob in common for the PASS signal and FAIL alarm.

*3. Can be factory-modified to nominal 110V, 120V, 220V, 230V and 240V.

*4. Power consumption of the instrument modified to operate on an AC line voltage other than 100V is as follows.

110V / 120V: 25VA or less

220V / 230V / 240V: 45VA or less