2. SPECIFICATIONS

Withstanding Voltage Tester

Test Voltage

Applied voltage:	0 - 2.5 kV AC and 0 - 5 kV AC (two ranges)
Wattage rating:	500 VA (5 kV, 100mA, with 100 V line voltage) (See Note 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 FS and 5 kV FS, two ranges linear scales
Class of meter:	JIS Class 1
Accuracy:	±3% FS or better
Indication:	Mean-value response, effective-value scale graduation

Judgement of Test Result
(GO-NOGO judgement. Output cutoff by leakage current detection)

Judgement:

- Window comparator system
- NG judgement when leakage current larger than high limit reference value is detected.
- NG judgement also when leakage current smaller than low limit reference value is detected.
- When NG judgement is made, output is cutoff and NG alarm is generated.
- If no NG judgement is made after preset period has elapsed, GOOD signal is generated.

High limit reference value (CUTOFF CURRENT):	0.5/1/2/4/8/10/100 mA (7 values) By combinations of above values, a range of 0.5 - 25.5 mA can be covered in 0.5-mA steps.

Low limit reference value (LOWER REFERENCE):	0 to one-half of high limit reference values (continuously variable)	
Accuracy of judgement: (See Note 2.)	○ ±5% of high limit reference value ○ ±20% of low limit reference value (one-half of high limit reference values at maximum counterclockwise). (Others 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 needed for detection: (See Note 3.)	2.5 kV range:	Approx. 450 V when set at 100 mA
	5 kV range:	Approx. 550 V whem set at 100 mA

Others

Test time:	0.2 seconds - 10 minutes (with 4-range timer)
Terminals:	Terminals for monitoring of leakage current

Note 1: When the Tester is delivering its maximum rated current, its maximum rated continuous operation time is 30 minutes.

Note 2: 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 next table. 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.

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

Note 3: When making an NG judgement test with the output teminals shortid, 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.

Test Voltage Waveform: When an AC output voltage is applied to a capacitive load, it is possible that the voltage becomes higher than that 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 waveformmay be distorted. When the test voltage is 1.5 kV, however, effects caused by a capacitance of 1000 pF or less are negligeble.

Insulation Resistance Tester

Measuring Voltages:	500 V and 1000 V (two ranges), DC, negative polarity

Effective Measurange Ranges

500 V range:	1 - 1000 MΩ
1000 V range:	2 - 2000 MΩ

Values at Center of Scale

500 V range:	20 MΩ
1000 V range:	50 MΩ

Accuracy

1st effective measuring range:	±5% of the indicated value
2nd effective measuring range:	±10% of the indicated value

Note 4: At 25°C ±10°C

Note 5: 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.

Measuring terminal voltage

When output terminals are open:	+5%, -0% of rated measuring voltage
When at center of scale:	95% or more of rated measuring voltage

Judgement of Test Result (GO-NOGO judgement)

Judgement:

- Window comparator system (mutually indepent settings of high limit and low limit)
- NG judgement when measured resistance is smaller than the low limit reference value.
- NG judgement when measured resistance is larger than the high limit reference value.

- When NG judgement is made, output is cutoff and NG alarm is generated.
- If no NG judgement is made after preset period has elapsed, GOOD signal is generated.

Limit reference value setting range: Low and high limit reference values can be set at any points whthin the effective measuring range of the Tester.

Accuracy of judgement

1st effective measuring range : ±10% of set value

2nd effective measuring range : ±15% of set value

Note 6: at 25°C ±10°C

Waiting-time for judgement: Approx. 0.3 sec

Test Time: 0.5 second - 10 minutes (with 4-range timer)

Note 7: Since the Tester operates on an AC power line, measuring errors may be introduced if the device under test is connected to the AC line.

Overall Specifications

Types of Tests

1. AUTO W → I: Withstanding voltage test first and insulation resistance test next
2. AUTO I → W: Insulation resistance test first and withstanding voltage test next
3. MANUAL W: Withstanding voltage test alone
4. MANUAL I: Insulation resistance test alone

Remote Control

Test/Reset control:

- Low active control
- Input conditions
  High level input voltage: 11 - 15 V
  Low level input voltage: 0 - 4 V
  Low level sweep out current: ≦ 2 mA
  Input pluse width : 20 msec minimum

Note 8: The input terminal is pulled up to +15V supply voltage by resistor. Opening of the input terminals is equivalent to a high level input.

Protection: Protection is effected when PROTECTION input terminal is made open (test is disabled).

Output Signals

TEST ON signal: Delivered during entire test-on period. Make-contact signal and lamp

GOOD signal: Delivered when GOOD judgement is made, for approximately 50 msec. Make-contact signal, lamp and buzzer

W/NG alarm: Delivered continuously when NG judgement of withstanding voltage test is made. Make-contact signal, lamp and buzzer

I/NG alarm: Delivered continuously when NG judgement of insulation resistance test is made. Make-contact signal, lamp and buzzer

READY signal: Delivered when in the READY state. Make-contact signal

Note 9: (1) The rating of the signal contacts is 100 V AC, 1 A, or 30 V DC, 1 A.

(2) Loudness of the buzzer is adjustable with a knob in common for the GOOD signal and NG alarm.

Special Test Modes: Selectable with DIP switches at rear of the Tester

1. DOUBLE ACTION: Test starts only when the TEST button is pressed within approximately 0.5 seconds after pressing the RESET button.

2. GOOD HOLD: The GOOD state is held

3. MOMENTARY: Test is executed only during the period the TEST button is kept pressed.

4. NG ALARM: NG alarm and PROTECTION state cannot be reset by the remote-control RESET signal.

Ambient Temperature and Humidity

Specification range:	5 to 35°C (41 to 95°F), 20 to 80% RH
Operable range:	0 to 40°C (32 to 104°F), 20 to 80% RH
Storage range:	-20 to 70°C (-4 to 158°F), 80% RH or less
EMC :	Complied eith the follwing standards European Community Requirements(89/336/EEC) EN5501 Radiated Emissions Class A Conducted Emissions Class A EN50082-1 IEC801-2 Electro-static Discharge IEC801-3 Radiated Susceptibility IEC801-4 Fast Burst Transient Under following conditions 1.Used HV test leadwires TL01-TOS. 2.No discharge in testing.

Power Requirements

Line voltage:	100 V ±10%, 50/60 Hz AC (Can be factory-modified to nominal 110V, 115V, 120V, 200V, 220V, 230V and 240V.)
Power consumption When no load (RESET state):	15 VA or less (Note 10)
When with rated load:	Approx. 600 VA
Insulation resistance:	30MΩ or more, with 500 V DC
Withstanding voltage:	1000 V AC, 1 minute
Dimensions:	430 W × 199 H × 370 D mm (16.93 W × 7.83 H × 14.57 D in.)
Including extrusions:	430 W × 214 H × 435 D mm (16.93 W × 8.43 H × 17.13 D in.)
Weight:	Approx. 24 kg (53 lb) (approx. 28 kg (62 lb) when in Line Voltage modified)

Accessories:

- TL01-TOS High Voltage Test Leadwires, approx. 1.5 m (4.9 ft) long, 1 set
- 5P DIN plug (assembly type), 1
- Power cord set, 1
- AC Plug Adaptor, 1
  (The AC Plug Adaptor is provided only for model versions for use within Japan.)
- "HIGH VOLTAGE DANGER" label, 1
- Instruction Manual, 1 copy

Note 10: Power consumption of the instrument modified to operate on an AC line voltage other than 100 V is as follows.
110/115/120 V : 25 VA or less
200/220/230/240 V: 45 VA or less

Options:

- RC01-TOS Remote Control Box
- RC02-TOS Remote Control Box
- HP01A-TOS High Voltage Test Probe, approx. 1.5 m(4.9 ft) long
- HP02A-TOS High Voltage Probe, approx. 3 m (9.8 ft)long
- TL02-TOS High Voltage Test Leadwires, approx. 3 m (9.8 ft) long
- PL01-TOS Warning Light Unit
- BZ01-TOS Buzzer Unit
- BH4M-TOS Rackmount Bracket (for JIS)
- BH5-TOS Rackmount Bracket (for EIA)