

# TOS5101

## WITHSTANDING VOLTAGE TESTER



\*This UL Listed Product is available for Inline voltage of AC 120V only.

**AC/DC**  
**10 kV**  
**Transformer Capacity: 500 VA**

### Outline

The Model TOS5101 is a withstanding voltage tester having a high test voltage of 0 to 5 kV or 0 to 10 kV (transformer capacity: 500 VA) that allow both application of AC and DC. The use of a high luminance, large fluorescent display tube for the display enables data including measured values, status and judgement results to be extremely legible in comparison with previous models.

The Pass/fail function employs a window comparator method that enables TOS5101 to make fail judgement of current leakage over the upper reference value and below the lower reference value set on the front panel. Thus, highly reliable testing can be performed including that for test lead disconnection and defective contact. By employing the remote control function for start and stop operations and using this function with the judgement result output function enables greater automation and efficiency of testing.

In addition, in order to prevent erroneous operation and accidents, the TOS5101 is also equipped with a key lock function and interlock function, a high-voltage output terminal having a narrowed insertion port, a large DANGER lamp, and an automatic discharge function (during DC operation) that removes charge from the testpiece. These features give the TOS5101 a high degree of safety and reliability.

### Features

- Complies with various safety standards
- AC/DC output (0 to 10 kV)
- Large color display
- Digital voltmeter and ammeter
- Digital timer
- Window comparator type employed for Pass / fail judgement.
- Equipped with remote control function
- Various signal outputs
- Automatic discharge function (during DC operation)
- Provided with zero turn-on switch
- Compact size



A high-luminance, fluorescent display tube is employed for display of settings, status and judgement results.

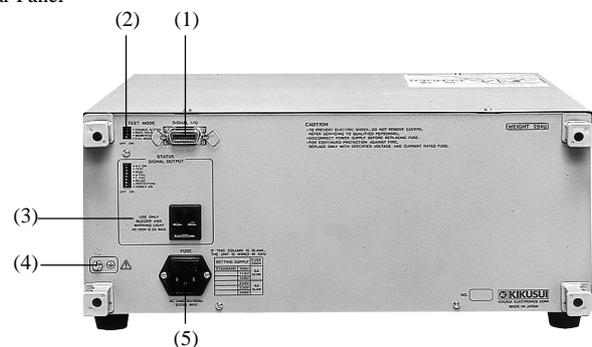
### Specifications

■ Test Voltage	AC and DC
Applied Voltage	0 to 5/0 to 10 kV
Maximum Rated Output	AC: 500VA/10 kV, 50 mA (note 1) DC: 50W/10kV, 5 mA (note 1)
Wattage Rating	500 VA
Waveform	Commercial line waveform
Voltage Regulation	AC: Max. 15% (for max. rated load to no load) DC: Max. 3% (for max. rated load to no load)
Switching	Use of a zero turn-on switch
Ripple (DC)	100 Vp-p typ. at 10 kV, no load 200 Vp-p typ. at max. rated output
■ Output Voltmeter	
Scale	Analog: 10 kV full scale, AC/DC
Accuracy	Analog: ±5% of full scale Digital: ±1.5% of full scale
AC Indication	Analog: Mean value response/rms value scale
Full Scale	Digital: 5 kV/10 kV full scale
AC Response	Digital: Mean value response/rms value display
■ Ammeter	
Accuracy	Digital: ±(5% + 20μA) of upper cutoff current
AC Response	Digital: Mean value response/rms value display
■ Pass/fail Judgement Function	
Type of Judgement	Window comparator type
	● FAIL judgement *When current detected above upper cutoff current *When current detected below lower cutoff current (FAIL signal generated when FAIL judgement made)
	● PASS judgement *When set time has elapsed and no abnormality is detected
Upper Cutoff Current	AC: 0.1 to 55 mA
Setting Range	DC: 0.1 to 5.5 mA
Lower Cutoff Current	AC: 0.1 to 55 mA
Setting Range	DC: 0.1 to 5.5 mA
Judgement Accuracy	±(5% of upper cutoff current + 20μA)
Current Detection	Integration of current absolute value followed by comparison with reference value
Calibration	With rms value of sine wave using a pure resistance load
No-load output voltage	Approx. 970V when set to 50 mA AC Approx. 160V when set to 5 mA DC
■ Test Time Setting Range	0.5 to 999 sec (±10 ms) (timer-off function provided)
Accuracy	±20 ms
■ Signal Outputs	H.V ON - Open collector DANGER - Lamp TEST - Open collector, fluorescent display tube PASS - Open collector, fluorescent display tube, buzzer U FAIL - Open collector, fluorescent display tube, buzzer L FAIL - Open collector, fluorescent display tube, buzzer READY - Open collector, fluorescent display tube PROTECTION - Open collector, fluorescent display tube STATUS SIGNAL OUTPUT 100V AC(0.3 A Max.) ← Rating of open collector: 4.5 to 30V DC/400 mA (Max. Total)
■ Remote Control	Test and reset operations can be remote controlled in the following cases: ● When using a separately sold remote control box ● When using a separately sold high-voltage test probe ● When controlling with a make contact signal such as a relay or switch ● When using low active control by a logic device and so on

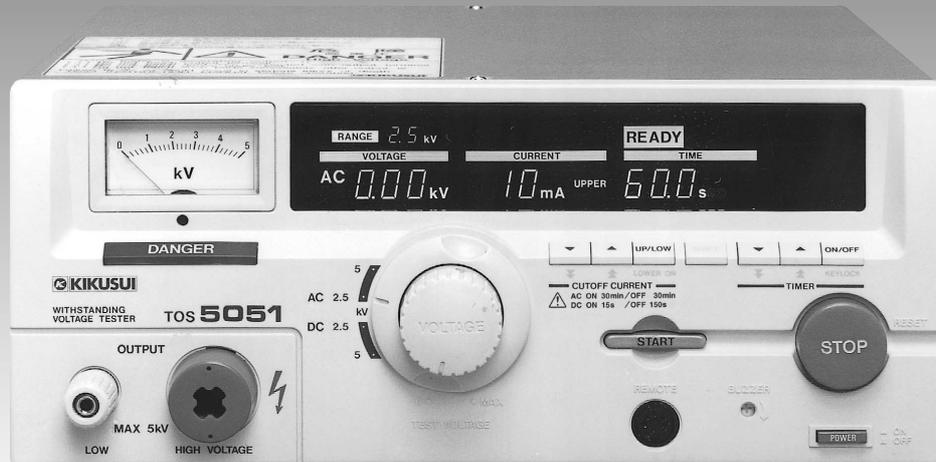
■ Interlock Function	Testing can no longer be performed when an interlock signal is input (PROTECTION state).
■ Line Voltage	100V±10%, 50/60 Hz (note 2)
■ Power Requirements	Max. 50 VA under no-load conditions Approx. 610 VA at rated load
■ EMC (note 3)	
	Complied with the following standards
	IEC61362-1: 1997-03/A1:1998-05 Electrical Equipment for Measurement, Control and Laboratory Use - EMC requirements Radiated Emissions Class A Conducted Emissions Class A
	IEC61000-4-2:1995-01 Electro-static Discharge /A1:1998-01
	IEC61000-4-3:1995-02 Radiated, radio-frequency, electromagnetic field
	IEC61000-4-4:1995-01 Electrical fast transient / Burst
	IEC61000-4-5:1995-02 Surge
	IEC61000-4-6:1996-04 Conducted disturbances
	IEC61000-4-11:1994-06 Voltage dips, short interruptions and voltage variations
	Under following conditions
	1. Used HV test leadwires TL03-TOS. 2. No discharge in testing.
■ Safety (note 3)	
	Complied with the following standards
	European Community Requirements (73/23/EEC) UL1244 (The UL-approved products with input voltage of 120V AC satisfy the UL1244 standard.)
■ Dimensions (MAX)	430W × 177H × 370D mm (430W × 195H × 450D mm)
■ Weight	Approx. 21 kg (for line voltage of 100V)
■ Accessories	High-voltage test lead TL01-TOS (max. allowable voltage: 5 kV/1.5 m) High-voltage test lead TL03-TOS (max. allowable voltage: 10 kV/1.5 m) 14-pin amphenol plug (assembled)

Note 1: Continuous output time may be limited depending on current high limit reference value and ambient temperature.  
Note 2: Nominal voltages of 110V, 120V, 220V, 230V and 240V available as factory options.  
Note 3: CE marking are put only on the products sold in Europe.

#### Rear Panel



- (1) Signal I/O  
Input/output connectors for interlock function input/output signals, start/stop remote control input signals and status output signal.
- (2) Test Mode Switch  
This is a DIP switch for setting special test modes. Parameter settings such as test start and interruption operations can be changed with this switch.
- (3) Status Signal Output Terminal  
This is a 100V AC output terminal for operating an optional warning lamp unit or buzzer unit. Conditions during AC 100V output (status, judgement results) are set with DIP switches.
- (4) Ground Terminal
- (5) Line Input Terminal (integrated with fuse holder)



\*This UL Listed Product is available for Inline voltage of AC 120V only.

**AC/DC**

**5 kV**

**Transformer capacity: 500 VA**

## Outline

The Model TOS5051 is a withstanding voltage tester having a transformer capacity of 500 VA and test voltage of 0 to 5 kV that allows both application of AC and DC.

The Pass/fail judgement function employs a window comparator type that enables highly reliable testing including that for test lead disconnection and defective contact.

Moreover, as a result of employing a remote control function for start and stop operations and being equipped with output signals for various judgement results, the TOS5051 is able to contribute to greater automation and efficiency of testing.

Various safety devices, including an automatic discharge function (during DC operation), are provided in full consideration of operator safety. In addition, the use of a large, color display makes the TOS5051 extremely legible, providing strong support for more accurate and safer operation.

## Features

- Complies with various safety standards
- AC/DC output (0 to 5 kV)
- Large color display
- Digital voltmeter and ammeter
- Digital timer
- Window comparator type employed for Pass/fail judgement.
- Equipped with remote control function
- Various signal outputs
- Automatic discharge function (during DC operation)
- Provided with zero turn-on switch
- Compact size



A high-luminance, fluorescent display tube is employed for display of settings, status and judgement results.

# TOS5051

## WITHSTANDING VOLTAGE TESTER

### Specifications

■ Test Voltage	AC and DC
Applied Voltage	0 to 2.5/0 to 5 kV
Maximum Rated	AC: 500VA/5 kV, 100 mA (note 1)
Output	DC: 50W/5 kV, 10 mA (note 1)
Wattage Rating	500 VA
Waveform	Commercial line waveform
Voltage Regulation	AC: Max. 15% (for max. rated load to no load) DC: Max. 3% (for max. rated load to no load)
Switching	Use of a zero turn-on switch
Ripple (DC)	50 Vp-p typ. at 5 kV, no load 100 Vp-p typ. at max. rated output
■ Output Voltmeters	
Scale	Analog: 5 kV full scale, AC/DC
Accuracy	Analog: $\pm 5\%$ of full scale Digital: $\pm 1.5\%$ of full scale
AC Indication	Analog: Mean value response/rms value scale
Full Scale	Digital: 2.5 kV/5 kV full scale
AC Response	Digital: Mean value response/rms value display
■ Ammeter	
Accuracy	Digital: $\pm(5\% + 20\mu\text{A})$ of upper cutoff current
AC Response	Digital: Mean value response/rms value display
■ Pass/fail Judgement Function	
Type of Judgement	Window comparator type
	● FAIL judgement * When current detected above upper cutoff current * When current detected below lower cutoff current (FAIL signal generated when FAIL judgement made)
	● PASS judgement * When set time has elapsed and no abnormality is detected
Upper Cutoff Current Setting Range	AC: 0.1 to 110 mA DC: 0.1 to 11 mA
Lower Cutoff Current Setting Range	AC: 0.1 to 110 mA DC: 0.1 to 11 mA
Judgement Accuracy	$\pm(5\%$ of upper cutoff current + 20 $\mu\text{A})$
Current Detection	Integration of current absolute value followed by comparison with reference value
Calibration	With rms value of sine wave using a pure resistance load
No-load Output Voltage	Approx. 460V when set to 100 mA AC Approx. 100V when set to 10 mA DC
■ Test Time Setting Range	0.5 to 999 s ( $\pm 10$ ms) (timer-off function provided)
Accuracy	$\pm 20$ ms
■ Signal Outputs	H.V ON - Open collector DANGER - Lamp TEST - Open collector, fluorescent display tube PASS - Open collector, fluorescent display tube, buzzer U FAIL - Open collector, fluorescent display tube, buzzer L FAIL - Open collector, fluorescent display tube, buzzer READY - Open collector, fluorescent display tube PROTECTION - Open collector, fluorescent display tube STATUS SIGNAL OUTPUT 100V AC (0.3A Max.) ☛ Rating of open collector: 4.5 to 30V DC / 400 mA (Max. Total)
■ Remote Control	Test and reset operations can be remote controlled in the following cases: ● When using a separately sold remote control box ● When using a separately sold high voltage test probe ● When controlling with a make contact signal such as a relay or switch ● When using low active control by a logic device and so on

■ Interlock Function	Testing can no longer be performed when an interlock signal is input (PROTECTION state).
■ Line Voltage	100V $\pm 10\%$ , 50/60 Hz (note 2)
■ Power Requirements	Max. 50 VA under no-load conditions Approx. 640 VA at rated load

#### ■ EMC (note 3)

Complied with the following standards

IEC61362-1: 1997-03/A1:1998-05

Electrical Equipment for Measurement, Control and Laboratory

Use - EMC requirements

Radiated Emissions Class A

Conducted Emissions Class A

IEC61000-4-2:1995-01 Electro-static Discharge

/A1:1998-01

IEC61000-4-3:1995-02 Radiated, radio-frequency, electromagnetic field

IEC61000-4-4:1995-01 Electrical fast transient / Burst

IEC61000-4-5:1995-02 Surge

IEC61000-4-6:1996-04 Conducted disturbances

IEC61000-4-11:1994-06 Voltage dips, short interruptions and voltage variations

Under following conditions

1. Used HV test leadwires TL01-TOS.

2. No discharge in testing.

#### ■ Safety (note 3)

Complied with the following standards

European Community Requirements (73/23/EEC)

UL1244

(The UL-approved products with input voltage of 120V AC satisfy the UL1244 standard.)

■ Dimensions (MAX) 320W  $\times$  132H  $\times$  300D mm  
(330W  $\times$  150H  $\times$  365D mm)

■ Weight Approx. 16 kg (for line voltage of 100V)

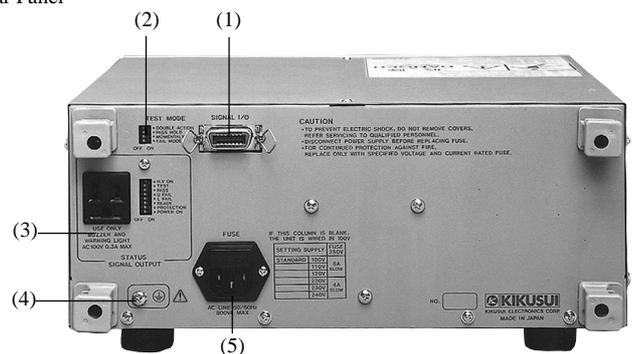
■ Accessories High-voltage test lead TL01-TOS (max. allowable voltage: 5 kV/1.5 m) 14-pin amphenol plug (assembled)

Note 1: Continuous output time may be limited depending on current high limit reference value and ambient temperature.

Note 2: Nominal voltages of 110V, 120V, 220V, 230V and 240V available as factory options.

Note 3: CE marking are put only on the products sold in Europe.

#### Rear Panel



#### (1) Signal I/O

Input/output connectors for interlock function input/output signals, start/stop remote control input signals and status output signal.

#### (2) Test Mode Switch

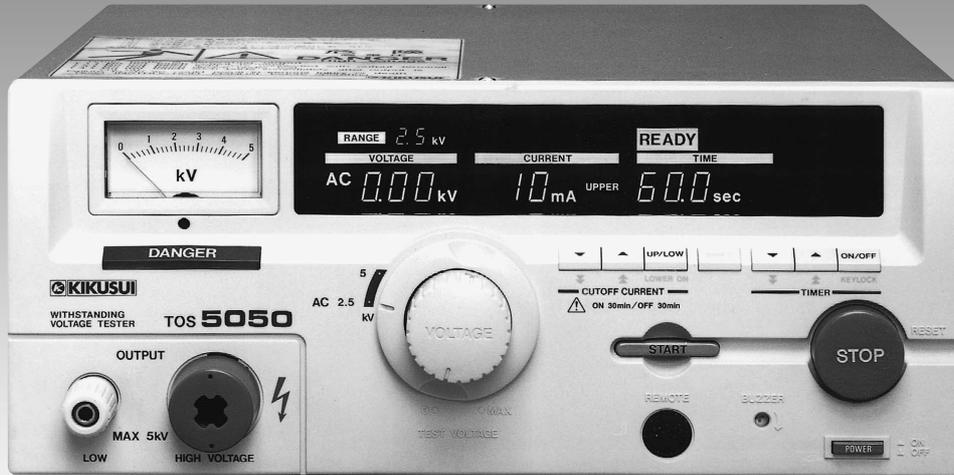
This is a DIP switch for setting special test modes. Parameter settings such as test start and interruption operations can be changed with this switch.

#### (3) Status Signal Output Terminal

This is a 100V AC output terminal for operating an optional warning lamp unit or buzzer unit. Conditions during AC 100V output (status, judgement results) are set with DIP switches.

#### (4) Ground Terminal

(5) Line Input Terminal (integrated with fuse holder)



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**AC**  
**5 kV**  
**Transformer capacity: 500 VA**

### Outline

The Model TOS5050 is a withstanding voltage tester for AC use only having a transformer capacity of 500 VA and test voltage of 0 to 5 kV.

Functions include Pass/fail judgement (using a window comparator type), remote control function, memory backup function, interlock function and other features that realize high levels of safety, reliability and ease of operation during use by the operator. In addition, the use of a large color display and a considerable reduction in size make the TOS5050 both more legible and easier to handle.

### Features

- Complies with various safety standards
- AC use only (0 to 5 kV)
- Large color display
- Digital voltmeter and ammeter
- Digital timer
- Window comparator type employed for Pass/fail judgement.
- Equipped with remote control function
- Various signal outputs
- Provided with zero turn-on switch
- Compact size



A high-luminance, fluorescent display tube is employed for display of settings, status and judgement results.

# TOS5050

## WITHSTANDING VOLTAGE TESTER

### Specifications

■ Test Voltage	AC only
Applied Voltage	0 to 2.5/0 to 5 kV
Maximum Rated Output	AC: 500VA/5 kV, 100 mA (note 1)
Wattage Rating	500 VA
Waveform	Commercial line waveform
Voltage Regulation	Max. 15% (for max. rated load to no load)
Switching	Use of a zero turn-on switch
■ Output Voltmeters	
Scale	Analog: 5 kV full scale
Accuracy	Analog: $\pm 5\%$ of full scale Digital: $\pm 1.5\%$ of full scale
Indication	Analog: Mean value response/rms value scale
Full Scale	Digital: 2.5 kV/5 kV full scale
Response	Digital: Mean value response/rms value display
■ Ammeter	
Accuracy	Digital: $\pm(5\% + 20\mu\text{A})$ of upper cutoff current
Response	Digital: Mean value response/rms value display
■ Pass/fail Judgement Function	
Type of Judgement	Window comparator type
	● FAIL judgement
	* When current detected above upper cutoff current
	* When current detected below lower cutoff current (FAIL signal generated when FAIL judgement made)
	● PASS judgement
	* When set time has elapsed and no abnormality is detected
Upper Cutoff Current	0.1 to 110 mA
Setting Range	
Lower Cutoff Current	0.1 to 110 mA
Setting Range	
Judgement Accuracy	$\pm(5\%$ of upper cutoff current + $20\mu\text{A})$
Current Detection	Integration of current absolute value followed by comparison with reference value
Calibration	With rms value of sine wave using a pure resistance load
No-load Output Voltage	Approx. 460V when set to 100 mA
■ Test Time Setting Range	0.5 to 999 s (timer-off function provided)
Accuracy	$\pm 20$ ms
■ Signal Outputs	H.V ON - Open collector DANGER - Lamp TEST - Open collector, fluorescent display tube PASS - Open collector, fluorescent display tube, buzzer U FAIL - Open collector, fluorescent display tube, buzzer L FAIL - Open collector, fluorescent display tube, buzzer READY - Open collector, fluorescent display tube PROTECTION - Open collector, fluorescent display tube STATUS SIGNAL OUTPUT 100V AC (0.3 A Max.) ☛ Rating of open collector: 4.5 to 30V/ 400 mA (Max. Total)
■ Remote Control	Test and reset operations can be remote controlled in the following cases:
	● When using a separately sold remote control box
	● When using a separately sold highvoltage test probe
	● When controlling with a make contact signal such as a relay or switch
	● When using low active control by a logic device and so on

■ Interlock Function	Testing can no longer be performed when an interlock signal is input (PROTECTION state).
■ Line Voltage	100V $\pm 10\%$ , 50/60 Hz (note 2)
■ Power Requirements	Max. 25 VA under no-load conditions Approx. 640 VA at rated load
■ EMC (note 3)	
Complied with the following standards	
IEC61362-1: 1997-03/A1:1998-05	
Electrical Equipment for Measurement, Control and Laboratory Use - EMC requirements	
Radiated Emissions Class A	
Conducted Emissions Class A	
IEC61000-4-2:1995-01 /A1:1998-01	Electro-static Discharge
IEC61000-4-3:1995-02	Radiated, radio-frequency, electromagnetic field
IEC61000-4-4:1995-01	Electrical fast transient / Burst
IEC61000-4-5:1995-02	Surge
IEC61000-4-6:1996-04	Conducted disturbances
IEC61000-4-11:1994-06	Voltage dips, short interruptions and voltage variations

#### Under following conditions

1. Used HV test leadwires TL01-TOS.
2. No discharge in testing.

#### ■ Safety (note 3)

##### Complied with the following standards

European Community Requirements (73/23/EEC)  
UL1244

(The UL-approved products with input voltage of 120V AC satisfy the UL1244 standard.)

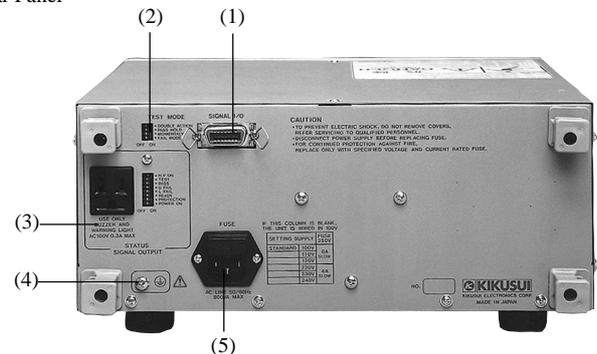
■ Dimensions (MAX)	320W × 132H × 300D mm (330W × 150H × 365D mm)
■ Weight	Approx. 15 kg (for line voltage of 100V)
■ Accessories	High-voltage test lead TL01-TOS (max. allowable voltage: 5 kV/1.5 m) 14-pin amphenol plug (assembled)

Note 1: Continuous output time may be limited depending on current high limit reference value and ambient temperature.

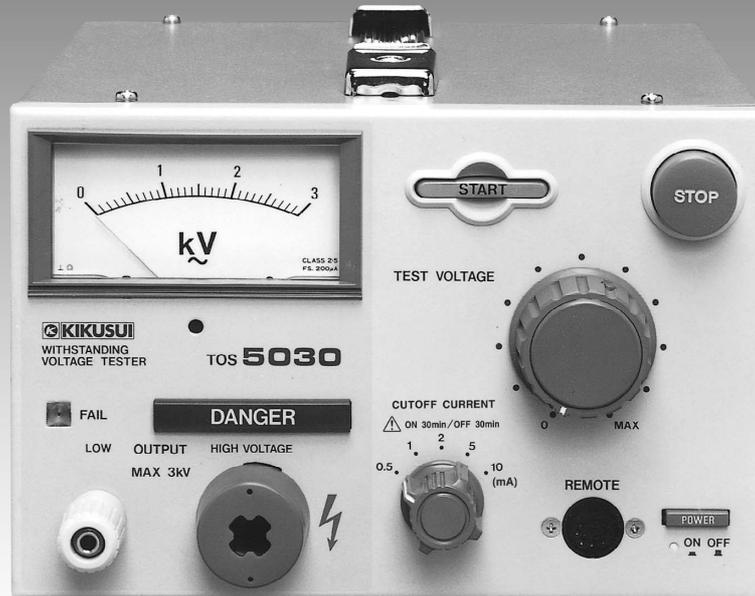
Note 2: Nominal voltages of 110V, 120V, 220V, 230V and 240V available as factory options.

Note 3: CE marking are put only on the products sold in Europe.

#### Rear Panel



- (1) Signal I/O  
Input/output connectors for interlock function input/output signals, start/stop remote control input signals and status output signal.
- (2) Test Mode Switch  
This is a DIP switch for setting special test modes. Parameter settings such as test start and interruption operations can be changed with this switch.
- (3) Status Signal Output Terminal  
This is a 100V AC output terminal for operating an optional warning lamp unit or buzzer unit. Conditions during AC 100V output (status, judgement results) are set with DIP switches.
- (4) Ground Terminal
- (5) Line Input Terminal (integrated with fuse holder)



\*This UL Listed Product is available for Inline voltage of AC 120V only.

**Economy Model**  
**AC**  
**3 kV, 10 mA**

### Outline

The Model TOS5030 is an AC withstanding voltage tester having an AC output of 3 kV and 10 mA. Despite being an economy model, the TOS5030 is equipped with a zero turn-on switch, remote control function for start and stop operations and a FAIL signal output function.

In addition, the compact size and light weight enable it to be used easily for intermediate inspections of devices and testing of electronic components on production lines. (Not compatible with various safety standards.)

With respect to safety and reliability as well, the TOS5030 features a safe construction including a start switch structure that prevents erroneous operation and a narrow insertion port for the high-voltage power cable.

### Features

- AC use only (0 to 3 kV)
- Remote control function for start and stop operations
- FAIL signal output (lamp, buzzer and make contact signals)
- Provided with zero turn-on switch
- Safe high-voltage output terminal
- Economy model

# TOS5030

## WITHSTANDING VOLTAGE TESTER

### Specifications

■ Test Voltage	AC only
Applied Voltage	0 to 3 kV
Wattage Rating	30 VA/3 kV, 10 mA (at nominal line voltage) (note 1)
Waveform	Commercial line waveform
Voltage Regulation	Max. 15% (for max. rated load to no load)
Switching	Use of a zero turn-on switch
■ Output Voltmeter	
Type of Meter	JIS Class 2.5
Scale	3 kV full scale
Accuracy	±5% of full scale
Indication	Mean value response/rms value scale
■ Pass/fail Judgement Function	
Type of Judgement	FAIL judgement *When current detected above reference value *FAIL signal generated when FAIL judgement made
Cutoff Current Setting Values	0.5/1/2/5/10 mA
Judgement Accuracy	±5% of preset cutoff current
Current Detection	Integration of current absolute value followed by comparison with reference value
Calibration	With rms value of sine wave using a pure resistance load
No-load Output Voltage	Approx. 400V when set to 10 mA
■ Remote Control	Test and reset operations can be remote controlled in the following cases: <ul style="list-style-type: none"><li>● When using a separately sold remote control box</li><li>● When using a separately sold high-voltage test probe</li><li>● When controlling with a make contact signal such as a relay or switch</li><li>● When using low active control by alogic device and so on</li></ul>

■ Signal Output	FAIL signal in the form of a lamp, buzzer and make contact signal output
■ Line Voltage Range	100V±10%, 50/60 Hz (note 2)
■ Power Requirements	Max. 10 VA under no-load conditions (READY state) Approx. 45 VA at rated load
■ EMC (note 3)	Complied with the following standards IEC61362-1: 1997-03/A1:1998-05 Electrical Equipment for Measurement, Control and Laboratory Use - EMC requirements Radiated Emissions Class A Conducted Emissions Class A IEC61000-4-2:1995-01 Electro-static Discharge /A1:1998-01 IEC61000-4-3:1995-02 Radiated, radio-frequency, electromagnetic field IEC61000-4-4:1995-01 Electrical fast transient / Burst IEC61000-4-5:1995-02 Surge IEC61000-4-6:1996-04 Conducted disturbances IEC61000-4-11:1994-06 Voltage dips, short interruptions and voltage variations

Under following conditions

1. Used HV test leadwires TL01-TOS.
2. No discharge in testing.

#### ■ Safety (note 3)

Complied with the following standards

European Community Requirements (73/23/EEC)  
UL1244

(The UL-approved products with input voltage of 120V AC satisfy the UL1244 standard.)

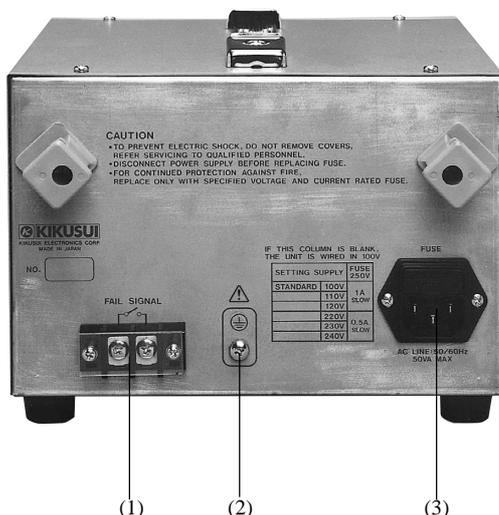
■ Dimensions (MAX)	200W × 132H × 215D mm (210W × 160H × 280D mm)
■ Weight	Approx. 4.8 kg (for line voltage of 100V)
■ Accessories	High-voltage test lead TL01-TOS (max. allowable voltage: 5 kV/1.5 m) 5P DIN plug (assembled)

Note 1: Continuous output time may be limited depending on current high limit reference value and ambient temperature.

Note 2: Nominal voltages of 110V, 120V, 220V, 230V and 240V available as factory options.

Note 3: CE marking are put only on the products sold in Europe.

### Rear Panel



#### (1) FAIL Signal Terminal

A make contact signal is output from this terminal by a FAIL signal.

#### (2) Ground Terminal

#### (3) Line Input Terminal (integrated with fuse holder)