

LIGHTNING SURGE SIMULATOR



LSS-15AX series

GENERAL

Surges represent transients that might be induced in cables by lightning. By their nature, fairly high energy charges may easily damage or upset unprotected electronics circuits and components. Surges are not a new problem. Many companies have been testing their products at various stages of the products life: design tests, qualification tests, production tests and diagnostic tests. The advance of surge suppression devices and technique does not lessen the importance of surge testing, but rather increases it, as the requirement to reduce power consumption and to increase the operational speed of semiconductors has become more demanding. In addition, the issue of surge testing is attracting renewed interest since this form of immunity is now a must for almost all electronic products for access to the global market.

FEATURES

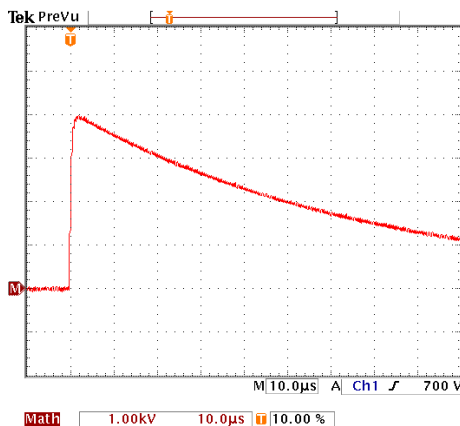
Fully compliant with the requirements called for in the 2nd edition of IEC 61000-4-5 standard, the LSS-15AX series simulators provide a testing facility for up to 15kV test voltage without sacrificing safety and ease of use. The LSS-15AX simulators generate the two combination pulses 1.2/50 μ s (8/20 μ s) and 10/700 μ s (5/320 μ s)

- Fully programmable and easy to use simulator that meets and far exceeds the **IEC 61000-4-5 (2nd edition) requirements**
- 15kV testing
- Advanced safety
- Flexible test sequencing with Program Mode

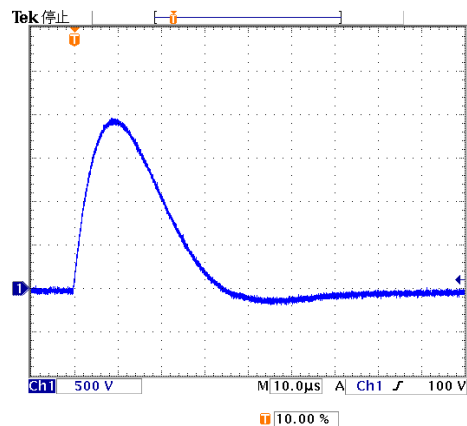


MODEL : LSS-15AX-A1A

OUTPUT WAVEFORMS EXAMPLE



Voltage surge waveform: 1.2/50 μ s
Voltage: 4kV V:1kV/Div. H:10 μ s/Div



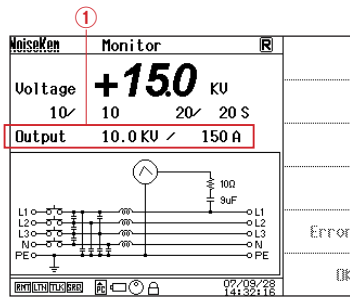
Current surge waveform: 8/20 μ s
Current: 2000A V:500A/Div H:10 μ s/Div

Highly repeatable and exact waveform. A new methodology has achieved an improvement in actual output waveform. The times to half-value, to say, 50 microseconds, have very limited reduction when the pulses are coupled to the power line CDN, compared to the original waveform measured at the generator output itself.

FUNCTIONS

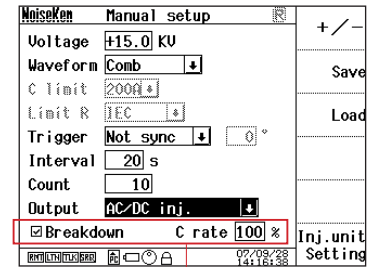
① Peak level monitor

Values of the actual peak amplitudes are monitored and shown for both voltage and current.



② Automatic stop function by detecting a breakdown

The simulator automatically stops generating the pulses if the peak current measured exceeds a limit, which can be freely set as the threshold



PANEL EXPLANATION

Emergency stop button

This button, easily accessible and placed on the front panel, enables the operator to stop the generation of high voltages anytime he desires. Simultaneously power supply to EUT turns off.



Infra-red remote controller (option) Model:08-00006B

A remote controller with the same function as the control panel of the simulator

GP-IB or RS-232C can be equipped optionally.

Safety interlock

A safety interlock is provided through the special design high voltage connector. The high voltage circuitry never be activated when the connector is not correctly positioned or not firmly locked.

Warning lamp connector

Used to connect the warning lamp (option)

Easy operation

Very intuitive settings can be done by the assistance of the well configured user-interface consisting of a 5-inch LCD, ten-key, functions keys and others. Coupling modes are graphically shown, allowing the operator to select the desired mode and allows easy reference of settings when the test is in progress.

Memory card (option)

A PCMCIA memory card, which is very common to notebook PCs, is adopted. Test log and setting and screen hard copy files can be stored and retrieved.



- <A> Control unit
- Surge generator
- <C> AC/DC lines CDN
- <D> Telecom lines CDN
- <E> Input panel

<LSS-15AX C3A>

SPECIFICATIONS

Item		Models	LSS-15AX A1A LSS-15AX A3A	LSS-15AX C1A LSS-15AX C3A
Surge generating unit	Output waveform		1.2/50 μ s (8/20 μ s)	① 1.2/50 μ s(8/20 μ s)
	Open circuit voltage (short circuit current)			② 10/700 μ s (5/320 μ s)
	Output voltage/current		15kV/7500A	① 15kV/7500A (1.2/50 μ s) ② 15kV/375A (10/700 μ s, at output 40 Ω)
	Surge switching element			By Ignitron
	Output polarity			Positive or negative
	Surge repetition cycle		20 sec	① 20 sec. (1.2/50 μ s) ② 30 sec. (10/700 μ s)
	Output impedance		2 Ω	① 2 Ω (1.2/50 μ s) ② 40 Ω (10/700 μ s with limiter resistor)
AC/DC lines CDN	Injecting surge waveform			1.2/50 μ s
	Injecting surge voltage/current			15kV/7500A maximum
	Surge coupling		Between line and line:18 μ F	Between line and PE: 10 Ω +9 μ F
	AC Power capacity		Single phase, AC240V/30A (LSS-15AX A1A/C1A) Single phase/3-phase, AC600V/50A (LSS-15AX A3A/C3A)	
	Voltage drop		9V at 25A, 11V at 30A, 18V at 50A	
	DC Power capacity		DC60V/20A	
	Decoupling coil		1.5mH (each phase)	
	Decoupling capacitor		10 μ F (Between line and line, between line and PE)	
	Coupling phase angle control		0 ~ 360° (at 1° step)	
	Residual voltage		<15% of test voltage or twice of rated voltages (peak) of EUT	
Communication lines CDN	Injecting surge waveform			1.2/50 μ s 10/700 μ s
	Injecting surge voltage			15kV max.
	Matching resistance			40 Ω (1.2/50 μ s) 25 Ω (10/700 μ s)
	Total line number			4 lines
	Decoupling coil			20mH (each phase)
	Power capacity of EUT			DC50V 100mA
Voltage/ current monitor output	Voltage/current monitor output ratio		1/2000 (voltage monitor), 1000A/V (current monitor)	
	Check circuit method		Waveform measuring method by magnetic coupling	
Auto control functions	Surge generating unit		<ul style="list-style-type: none"> • Polarity selection • Surge output port selection 	<ul style="list-style-type: none"> • Surge waveform selection • Polarity selection • Output port selection • 10/700μs limiter resistor selection
	AC/DC lines CDN			<ul style="list-style-type: none"> • Surge injection line selection • Surge return line selection • Coupling element selection
	Communication lines CDN			<ul style="list-style-type: none"> • Matching resistance selection • 2 lines/4 lines selection • Surge return line selection
Application function	Operation mode		1) Manual test mode 2) Program test mode	
	Voltage/current monitor function		1)Peak level display 2)Break down detecting	
External interface	Communication function		RS-232C (Optional), GP-IB (Optional)	
Power supply			AC90 ~ 120/200 ~ 240V 450VA 50/60Hz	
Dimensions (W) x (H) x (D)mm			555 X 1250 X 790 (A1A)	555 X 1500 X 790 (C1A)
			555 X 1500 X 790 (A3A)	555 X 1800 X 790 (C3A)
Weight			Approx. 200 kgs (A1A)	Approx. 270kgs (C1A)
			Approx. 320 kgs (A3A)	Approx. 340kgs (C3A)

<Computer Controlled> Lightning Surge Simulator

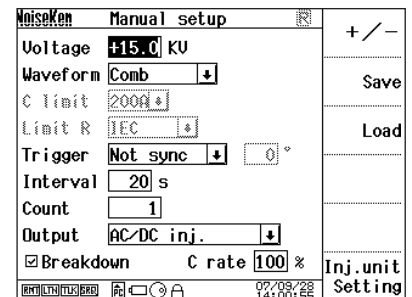
OPERATION

The following menus can be selected in the menu display.

- Manual mode test
- Program mode test
- Utilities
- Snap shotScreen image (Bit map form) can be saved in a memory card and can be used for making reports, etc.

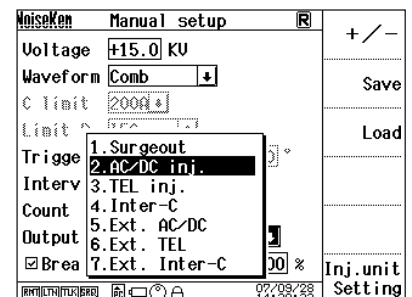
MANUAL MODE TEST SETTING DISPLAY (1)

When Manual mode test is selected in the menu display, the corresponding test setting display will appear. Output voltage, waveform and other test parameters can be set. Unnecessary items are shown in gray and the simulator does not accept a change in setting.



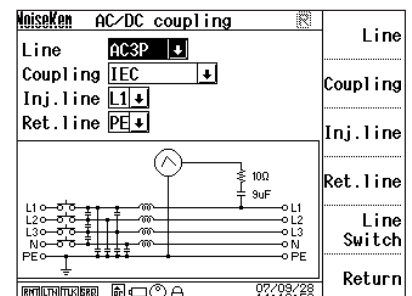
MANUAL MODE TEST SETTING DISPLAY (2)

Some items can be selected on pop up menus. The right example shows the choices on "Output to".



AC/DC COUPLING MODE DISPLAY

Press the coupling mode key. Coupling mode selection screen will appear. The example shows the 3-phase AC CDN screen on which coupling and return lines can be set. On the telecom CDN setting screen, the number of lines (2 or 4 lines), limit resistance (25Ω or 40Ω) and return line (1, 2, 3, 4, or PE) can be set.



OPTIONS

- Insulation transformer unit

Items	TF-2302P	TF-6503P
Input voltage	Single phase 240VAC max.(50/60H)	Single or 3-phase 600VAC max.(50/60 Hz)
Output current	30A max.	50A max.
Dielectric strength	Primary to core: AC4kV (1 minute) Secondary to core: AC4kV (1 minute) Primary-secondary: AC4kV (1 minute)	
Insulation resistance	100MΩ or over at DC500V	
Dimensions (mm)	350(W) x 475(H) x 400(D)	500(W) x 640(H) x 700(D)
Weight	Approx. 60 kg	Approx. 350 kg

- Infra-red remote controller: Model:08-00006B
- Warning lamp: Model 11-00008A
- Memory Card: Model 08-00003A
- EUT interface (30A terminal blocks and multi-receptacle): Model 18-00048B
- Calibration cable set: Model: 05-00099A

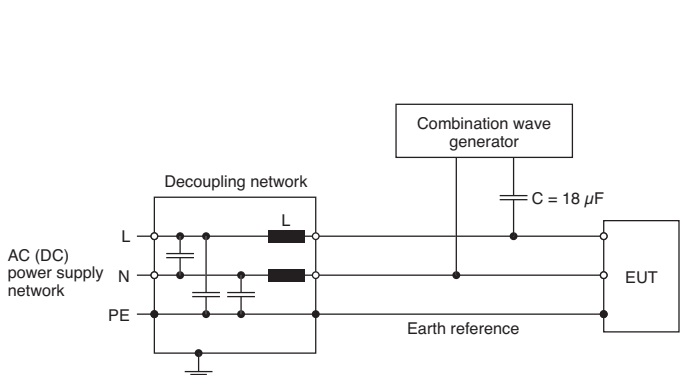


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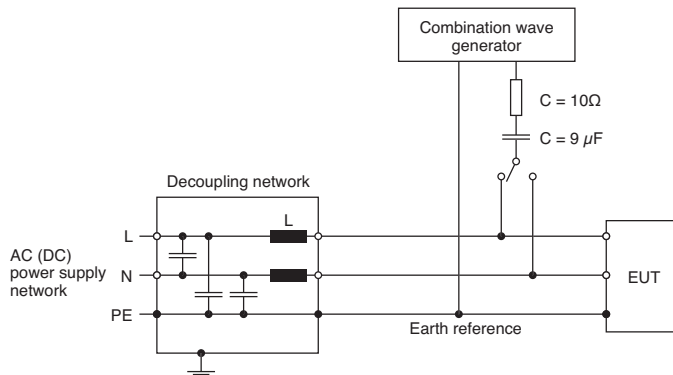
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<Computer Controlled> Lightning Surge Simulator

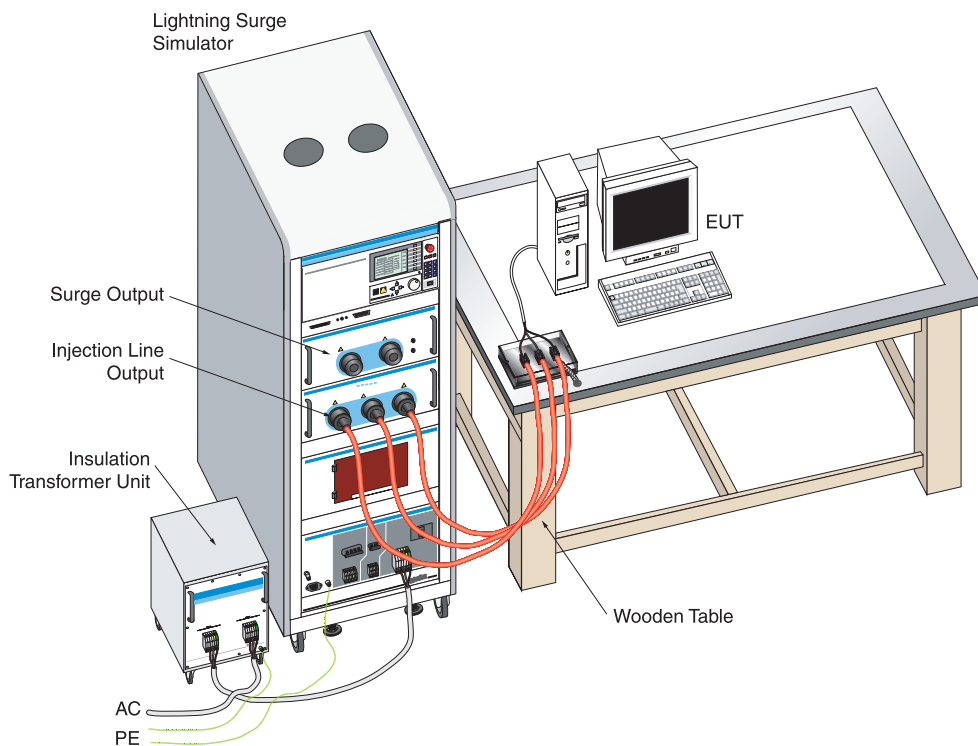
TEST SET UP EXAMPLES



Example of test set up for capacitive coupling on AD/DC lines: line-to-line coupling



Example of test set up for capacitive coupling on AD/DC lines: line-to-ground coupling



Capacitive coupling on single-phase AC lines in Line-to-line & line-to-ground modes

NOISE LABORATORY CO., LTD.

1-4-4, Chiyoda, Sagami-hara City, Kanagawa 229-0037 Japan
Tel: +81(0)42-712-2051 Fax: +81(0)42-712-2050

<http://www.noiseken.co.jp/>
E-mail: sales@noiseken.com

Authorized representative