NSG 3060A

THE MODULAR SOLUTION FOR 6 kV APPLICATIONS



- One box solution system
- Surge voltage up to 6.6 kV allows overtesting
- Easy to use 7” color touch screen
- IEC and ANSI coupling methods
- Parameters can be changed while test is running
- Wide range of optional test accesories
- High accuracy switching technology meets ANSI coupling requirements

Teseq’s new NSG 3060A conducted immunity generator takes the proven, user-friendly design of the highly successful NSG 3000 series to a new level. This innovative design uses modular architecture to provide a versatile system that can be configured for basic testing needs and expanded to meet the needs of sophisticated test laboratories.

Designed to fulfill requirements for CE mark and ANSI/IEEE C62.41.2 testing, the NSG 3060A performs tests for Combination wave surge, Ring wave and Electrical Fast Transient (EFT) pulses as well as Power Quality Testing (PQT). Extensive expansion capabilities enable the system to be configured for a much broader range of applications.

Using state of the art components, the self-contained modules set new standards with respect to switching and phase accuracy and exceed the existing standards’ requirements. With its powerful processors, the NSG 3060A can completely fulfill the unique coupling requirements specified by ANSI C62.41.2. This standard requires that the pulse amplitude be adjusted for the phase position of the pulse on the AC mains, and for the amplitude of the mains voltage.

A 7” touch panel display with superb contrast and color is the most striking feature of the new NSG 3060A. For fast and efficient data entry, input devices include an integrated keyboard and a thumbwheel with additional keys for sensitivity adjustment.

The user-friendly graphic display speeds test setup. Each parameter’s value is highly visible, and all settings can be quickly selected and modified with the generously sized touch input buttons. A stylus is not necessary, and ramp functions are programmed quickly and easily. Multi-step test procedures can be created and their sequence or parameter values changed easily.

The users can make manual parameter changes using the thumbwheel while a test is under way, providing an effective and fast method for identifying critical threshold values. The Test Assistance (TA) function allows users to initiate standardized test with just a few “clicks” to achieve quick, reliable results in a development environment.

The NSG 3060A has an Ethernet port for external PC control. The Windows-based control software simplifyes test programming and allows compilation of complex test sequences with diverse pulse types. Test reports can be generated during the test operation, allowing the operator to enter observations as the test progresses and increasing the efficiency of long-term tests.

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Model	EFT/Burst	Surge	PQT	Ring wave	Telecom-Surge
NSG 3060A-IEC	■	■	■		
NSG 3060A-ANSI	■	■	■	■	
NSG 3060A-FULL	■	■	■	■	■

The NSG 3060A performs tests according to the following specifications:

Combination wave pulse 1, 2/50 - 8/20 µs (Hybrid-Surge pulse)
Pulse conforms to IEC/EN 61000-4-5 and ANSI/IEEE C62.41.2

Parameter	Value
Pulse voltage (open circuit):	±200 V to 6.6 kV (in 1 V steps)
Pulse current (short circuit):	±100 A to 3.3 kA
Impedance:	2/12 Ω
Polarity:	positive / negative / alternate
Pulse repetition:	10 s* up to 9'999 s (in 1 s steps)
Test duration:	1 to 99'999 pulses, continuous
Phase synchronization:	asynchronous, synchronous 0 to 359º (in 1º steps)
Coupling:	ANSI / IEC / external

* Repetition rate depends on voltage:
200 to 4400 V = 10 s repetition time
4401 to 6600 V = 20 s repetition time

Ring wave 0.5 µs/100 kHz
Pulse conforms to IEC/EN 61000-4-12 and ANSI/IEEE C62.41.2

Parameter	Value
Pulse voltage (open circuit):	± 200 V to 6.6 kV (in 1 V steps)
Pulse current (short circuit):	±16.6 to ±550 A, ±10% ±6.6 to ±220 A, ±10% ±1 to ±33 A, ±10%
Impedance:	12/30/50 Ω
Polarity:	positive / negative / alternate
Pulse repetition:	10 s* up to 9'999 s (in 1 s steps)
Test duration:	1 to 99'999 pulses, continuous
Phase synchronization:	asynchronous, synchronous 0 to 359º (in 1º steps)
Coupling:	ANSI / IEC / external

* Repetition rate depends on voltage:
200 to 4400 V = 10 s repetition time 4401 to
6600 V = 20 s repetition time

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Burst (EFT) 5/50 ns
Pulse conforms to IEC/EN 61000-4-4

Parameter	Value
Pulse amplitude:	±200 V to 4.8 kV (in 1 V steps) - open circuit ±100 V to 2.4 kV (50 Ω matching system)
Burst frequency:	100 Hz to 1000 kHz
Polarity:	positive / negative / alternate
Repetition time:	10 ms to 9'999 ms
Burst time:	0.1 ms to 9'999 ms, single pulse
Test duration:	1 s to 9’999s, 1 min to 1600 min, endless
Phase synchonization:	asynchronous, synchronous 0 to 359º (in 1º steps)
Coupling:	internal / external

Dips & Interrupts
conform to IEC / EN 61000-4-11, IEC / EN 61000-4-29

Parameter	Value
Dips & Interrupts:	From EUT voltage input to 0 V, 0% (1)
Uvar with optional variac:	depending on model (VAR 3005A)
Uvar with step transformer:	0, 40, 70, 80% (TVT 1-250-16)
Peak inrush current capability:	> 500 A (at 230 V)
Switching times:	1 to 5 µs (100 Ω load)
Event time (T-Event):	20 µs to 9999 s, 0.5 to 9’999 cycles
Repetition time:	10 ms to 9’999 ms, 1 to 9’999 s
Test duration:	1 to 99’999 events, endless
Phase synchronization:	asynchronous, synchronous 0 to 359º (in 1º steps)

(1) In combination with VAR 3005A-S16, effective minimal dip voltage ~8 V. As specified in IEC 61000-4-11, chapter. 5.1 a test voltage level from 0% to 20% of the rated voltage is considered as a total interruption.

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Variation test (with VAR 3005A-S16 only)
conform to IEC / EN 61000-4-11

Parameter	Value
Uvar with optional variac:	up to 265 V (in 1 V steps) or up to 115% Uin (in 1% steps)
Decreasing time Td:	1 ms to 9.999 ms, 0.5 to 9999 cycles, abrupt
Time at reduced voltage Ts:	1 ms to 9.999 ms, 0.5 to 9999 cycles,
Increasing time Ti:	1 ms to 9.999 ms, 0.5 to 9999 cycles,
Repetition time:	1 s to 9’999 s
Events:	1 to 99’999

Pulsed magnetic field in conjunction with MFC 1000.x
conform to IEC/EN 61000-4-9

Parameter	Value
Field:	100 to 1200 A/m
Polarity:	positive / negative / alternate
Repetition time:	10 s to 9999s (in 1 s steps)
Impedance:	2 Ω
Coil / impedance factor:	0.01 to 100.00
Test duration:	1 to 9’999 pulses, endless
Phase synchronization:	asynchronous, synchronous 0 to 359º (in 1º steps)

Power magnetic field in conjunction with MFT 30/MFT 100 and MFC 1000.x
conform to IEC/EN 61000-4-8

Parameter	Value
Field:	MFT 30: 1 to max. 44 A/m (in 1 A/m steps), continuous MFT 100: 80 to max. 1000 A/m (in 1 A/m steps), short-term
Frequency:	50/60 Hz
Coil factor:	0.01 to 99.99
Test duration:	1 to 9’999 sec, continuous

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Telecom-surge 10/700 µs
conform to different standards

Parameter	Value
Pulse voltage (open circuit):	±200 V to 6.6 kV (in 1 V steps)
Energy storage capacitor:	20 µF
Polarity:	positive / negative / alternate
As per ITU and ETSI recommendations	
Front time:	10 µs ± 30%
Pulse duration:	700 µs ± 20%
As per FCC part 68, Pulse B	
Front time:	9 µs ± 30%
Pulse duration:	720 µs ± 20%
Output current @25 ohm output:	5 A - 165 A (short circuit)
Rise time	5 µs ± 30%
Pulse duration	320 µs ± 20%
As per IEC 61000-4-5	
Rise time:	10 µs ± 30%
Pulse duration:	700 µs ± 20%
Output current @25 ohm output:	5 A - 165 A (short circuit)
Rise time:	5 µs ± 20%
Pulse duration:	320 µs ± 20%

Outputs

Parameter	Value
As per ITU:	For 2-wire T1/T2 with 25 ohm each
As per FCC part 68:	For 2-wire T1/T2 with 25 ohm each
As per IEC 61000-4-5, Ed. 3:	For 4-wire T1/T2/T3/T4 with 25 Ohm each

Trigger circuit

Parameter	Value
Trigger of events:	Automatic, manual, external
Repetition rate:	max. 0.1 Hz (10 s - 999 s)
Event counter:	1 - 99,999, selectable

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Internal coupling network

Parameter		Value
EUT supply:		1-phase
EUT V AC:		Up to 300 Vrms *, 50 / 60 Hz (phase - neutral)
EUT V DC:		Up to 300 V DC
EUT current		1 x 16 Arms continuous (over heat protected)
Connections:	Front panel:	- EUT: 4mm banana plug - Burst OUT 50 Ω SHV - Trigger out BNC
	Rear panel	- EUT supply: banana plug 4 mm - Additional ground connector - Instrument supply 85 V to 264 V AC - Connector surge HV – COM
Surge		Standard coupling as per IEC 61000-4-5
Coupling mode		Line to Line Line(s) to ground
Mains decoupling:		1.5 mH 0% + 35%
Decoupling attenuation:		Residual pulse voltage on EUT power supply inputs 15 % max. Residual voltage on non-pulsed EUT power supply inputs 15 % max.
EFT (Burst)		Standard coupling all lines to ref ground (GND) IEC / EN 61000-4-4 L, N, PE to ref GND
		Any lines and combinatio :to ref GND: L to ref GND N to ref GND PE to ref GND L, N to ref GND L, PE to ref GND N, PE to ref GND
PQT:		Dips & interrupts to phase L

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Technical specification

Instrument supply	85 to 265 V AC, 50 / 60 Hz
Dimensions NSG 3060A-IEC	19”; 6 HU, 448 x 289 x 500 mm (W x H x D)
Weight NSG 3060A	30 kg (66 lbs)

Options

CDN 3063A-C32	Three phase 480 V / 32 A automatic coupling decoupling networks for Burst/EFT up to 4.8 kV, Surge, Ring Wave pulses up to 6,6 kV
CDN 3063A-C63	Three phase 480 V / 63 A automatic coupling decoupling network for Burst/EFT up to 4.8 kV, Surge, Ring Wave pulses up to 6,6 kV
CDN 3063A-C100	Three phase 480 V / 100 A automatic coupling decoupling network for Burst/EFT up to 4.8 kV, Surge, Ring Wave pulses up to 6,6 kV
CDN 3063A-C100.1	Three phase 480 V / 100 A automatic coupling decoupling network for Burst/EFT up to 4.8 kV, Surge, Ring Wave pulses up to 6,6 kV, switchable current ranges 32 A, 63 A and 100 A
CCI	Burst EFT capacitive coupling clamp for data line coupling per IEC 61000-4-4
CDN 117A-C6-4-1	Coupling networks for unsymmetrical signal-/data lines (surge)
CDN 118A-C6-4-1	Coupling networks for symmetrical signal-/data lines (surge)
CDN HSS-2	Coupling network for 2 kV surge pulse 1.2 / 50 µs IEC/EN 61000-4-5 on unshielded symmetrical high speed telecom lines (Ethernet)
PVF BKIT 1	Burst/EFT verification set
MD 300	Current probe 5 kA
Accessories for IEC/EN 61000-4-11	
TVT 1-250-16	Auto transformer with taps at 40%, 70%, 80% and 100% of the supply voltage; Nominal current 16A, 50/60Hz; manual operation.
TVT 1-250-16.1	Auto transformer with taps at 40%, 70%, 80% and 100% of the supply voltage; Nominal current 16A, 50/60Hz; automatic change 40/70/80%.
VAR 3005A-S16	Automatic single variable transformer, 1 x 16 A
Accessories for IEC/EN 61000-4-8/-4-9	
MFT 30	Current transformer for magnetic field generation with magnetic field coil MFC 1000.x. Range of magnetic fields: 0..3A/m (low range); 1..30A/m (high range)
MFT 100	Current transformer for magnetic field generation with magnetic field coil MFC 1000.x. Range of magnetic fields: 80...100A/m continuous; max. 1.200A/m short term
MFC 1000	Single turn magnetic field coil 1m x 1m, for IEC 61000-4-8 and IEC 61000-4-9. Height adjustable and coil 360 degrees rotatable. Double stand for MFC 1000 coil with base on casters with brakes; rotation mechanism with 3 position brakes.
MFC 1000.1	Single turn magnetic field coil 1m x 1m, for IEC 61000-4-8 and IEC 61000-4-9. Height adjustable and coil 360 degrees rotatable; double stand for MFC 1000.1 coil.

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