NSG 3060
THE MODULAR SOLUTION FOR 6 KV APPLICATIONS

- **Modular, expandable system**
- **Surge voltage to 6.6 kV for over-testing**
- **Easy to use 7" color touch screen**
- **IEC and ANSI coupling methods**
- **DTA (Direct Test Access) provides fast standard test settings**
- **Parameters can be changed while test is running**
- **Wide range of optional test accessories**
- **High accuracy switching technology meets ANSI coupling requirements**

Teseq's new NSG 3060 conducted immunity generator takes the proven, user-friendly design of the highly successful Modula 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.

The basic NSG 3060 system is designed to fulfill requirements for CE mark and ANSI C62.41 testing, including Combination wave, Ring wave and EFT pulses as well as PQT. Extensive expansion capabilities enable the system to be configured for a much broader range of applications.

New pulse generator modules can be added to the original system configuration quickly and easily with the NSG 3060's unique "Master-Slave" concept. This technology allows individual pulse modules to be calibrated separately with the calibration data and correction factors stored on the slave controller. New modules are simply installed with no need to return the entire system for calibration.

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. The use of powerful processors makes it possible to completely fulfill the unique coupling requirements specified by ANSI C62.41. This standard requires that pulse amplitude be adjusted for the phase position of the pulse on the AC mains and the amplitude of the mains voltage.

The most striking change in the new NSG 3060 series is the integration of a large 7" touch panel display which has superb contrast and color. Depending on requirements, the inputs are supported by an integrated keyboard, or by using a thumb wheel 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 selection of "Expert Mode" allows the user to make a manual parameter change with the thumbwheel during a test – an effective and fast method for simply activating critical threshold values.

In order to arrive at a conclusive result quickly and reliably in a development environment, a standardized test can be triggered with a few "clicks" using the integrated DTA function (Direct Test Access).

Firmware downloads can be performed quickly with the easily accessible SD memory card reader. Tests specified by the user will be saved completely. In the rare case that the storage space is not sufficient, the card can be replaced by a commercially available SD memory card and existing test files can be easily copied onto the larger SD card.

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The NSG 3060 has an Ethernet port for external control from a PC. The Windows software simplifies test programming and allows programming 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 thus increasing the efficiency of long-term tests.

The generator fulfills in herebelow mentioned version following pulses:

Combination wave pulse 1, 2/50 - 8/20 µs (Hybrid-Surge pulse)
Pulse conforms to IEC/EN 61000-4-5 and ANSI (IEEE) 62.41

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 Ω / 12 Ω
Polarity:	positive / negative / alternate
Pulse repetition:	5* to 20 s, up to 600 s (in 1 sec steps) * derated pending on selected pulse voltage and EUT supply voltage
Test duration:	1 to 9999 pulses, continuous
Phase synchronization:	asynchronous, synchronous 0° to 359° (in 1° steps)
Coupling:	ANSI / IEC / external

Ringwave 0.5 µs/100 kHz
Pulse conforms to IEC/EN 61000-4-12 and ANSI (IEEE) C62.41

Parameter	Value
Pulse voltage (open circuit):	± 200 V to 6.6 kV (in 1 V steps)
Pulse current (short circuit):	±16.6 A to ±550 A, ± 10% ±6.6 A to ±220 A, ± 10% ±1 A to ±33 A, ± 10%
Impedance:	12 Ω / 30 Ω / 200 Ω
Polarity:	positive / negative / alternate
Pulse repetition:	5* to 20 s, up to 600 s (in 1 s steps) * derated pending on selected pulse voltage and EUT supply voltage
Test duration:	1 to 9999 pulses, continuous
Phase synchronization:	asynchronous, synchronous 0° to 359° (in 1° steps)
Coupling:	ANSI / IEC / external

Teseq AG
Nordstrasse 11F 4542 Luterbach Switzerland
T +41 32 681 40 40 F +41 32 681 40 48
sales@teseq.com **www.teseq.com**

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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:	1 ms to 4200 s (70 min.)
Burst time:	1 µs to 1999 s, single pulse, continuous
Test duration:	1 s to 1000 h
Phasenlage:	asynchronous, synchronous 0° to 359° (in 1° steps)
Coupling:	ANSI / IEC / external

Dips & Drops
conforms to IEC/EN 61000-4-11

Parameter	Value
Dips & Drops:	From EUT voltage input to 0 V; 0%
Uvar with optional variac:	16.6 A to 550 A, ±10%
Uvar step transformer:	0%; 40%; 70%; 80%
Peak inrush current capability:	500 A (at 230 V)
Switching times:	1 to 5 µs (100 Ω load)
Event time:	20 µs to 1999 s; 1 to 99'999 cycles
Test duration:	1 s to 70'000 min.; 1 to 99'999 events; continuous
Repetition time:	40 µs to 35 min.; 1 to 99'999 cycles
Phase synchronization:	asynchronous, synchronous 0° to 359° (in 1° steps)

Variation test
conforms to IEC/EN 61000-4-11

Parameter	Value
Uvar with optional variac:	0 to 265 V (in 1 V steps); 0 to 115% (in 1% steps)
Repetition time:	1 ms to 35 min.; 1 to 99'999 cycles
Test duration:	1 ms to 5 s; 1 to 250 cycles (50 Hz); 1 to 300 cycles (60 Hz); abrupt
Repetition time:	10 ms to 10 s; 1 to 250 cycles (50 Hz); 1 to 300 cycles (60 Hz)
Test duration:	1 s to 99'999 min.; 1 to 99'999 events; continuous
Phase synchronization:	asynchronous, synchronous 0° to 359° (in 1° steps)

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Pulsed magnetic field in conjunction with INA 753
conforms to IEC/EN 61000-4-9

Parameter	Value
Field:	1 to 1200 A/m (in 1 A/m steps)
Polarity:	positive / negative / alternate
Repetition time:	5 s to 10 min. (in 1 s steps)
Impedance:	2 Ω
Coil factor	0.01 to 50.00
Test duration:	1 to 9'999 pulses; continuous
Phase synchronization:	asynchronous, synchronous 0° to 359° (in 1° steps)

Power magnetic field in conjunction with MFO 6501 / MFO 6502
conforms to IEC/EN 61000-4-8

Field:	1 to 40 A/m (in 1 A/m steps)
Frequency:	50 Hz / 60 Hz
Coil factor:	0.01 to 99.99
Test duration:	1 to 9'999 pulses; continuous

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NSG 3060
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Coupling networks CDN 3061

Parameter	Value
Instrument supply:	250 VAC/115 VAC
Decoupling attenuation:	Remanent pulse 15% max. Mains side crosstalk 15% max.
Standard-conform pulse pulse coupling	1.2/50 µs up to 6.6 kV 8/20 µs up to 3.3 kA
Mains decoupling:	1.5 mH 0%/+35%
Connections:	Pulse input from generator Cable connector for EUT supply Power inlet for CDN
EUT supply:	single phase
EUT VAC:	24 to 270 V rms, 50/60 Hz (Phase - Null), 400 Hz max.
EUT VDC:	0 to 270 VDC
EUT current	1 x 16 A rms continuous (temperature controlled) 1 x 25 A rms for 30 min.
EFT (Burst)	Standard coupling all lines to ref ground (GND) IEC 61000-4-4 and ANSI (IEEE) C62.41 L, N, PE ⇨ ref GND
	Any lines and combination to ref GND: L ⇨ ref GND N ⇨ ref GND PE ⇨ ref GND L,N ⇨ ref GND L, PE ⇨ ref GND N,PE ⇨ ref GND
Combination wave pulse:	IEC/EN 61000-4-5 Line to line (2 Ω) N ⇨ L / L ⇨PE / N ⇨ PE Lines to ground (12 Ω) L ⇨ PE / N ⇨ PE / L, N ⇨ PE
Combination wave & ring wave:	ANSI (IEEE) C62.41 Basic 1 & 2 L, N ⇨ PE & L ⇨ N Supplemetal 1 & 2 N ⇨ PE & L ⇨ PE Diagnostic 1 & 2 N, PE ⇨ L & L, PE ⇨ N
Ring wave:	IEC/EN 61000-4-12 12 Ω / 30 Ω / 200 Ω N ⇨ L / L ⇨ PE / N ⇨ PE L ⇨ PE / N ⇨ PE / L, N ⇨ PE
PQT:	Dips & Drops to phase L

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Dimensions/Weight	
Dimensions NSG 3060:	W: 449 mm (17.7"); H: 328 mm (12.9"; 7 HU); D: 565 mm (22.2")
Weight NSG 3060:	22 kg (48.5 lb)
Dimensions CDN 3061-C16:	W: 449 mm (17.7"); H: 338 mm (13.3"; 5 HU); D: 565 mm (22.2")
Weight CDN 3061-C16:	20 kg (44 lb)
Options	
CDN 3063-C32	Combined Surge & Burst coupling network for 480 VAC Ph-Ph, 32 A
CDN 3063-C63	Combined Surge & Burst coupling network for 480 VAC Ph-Ph, 63 A
CDN 8014/8015	Capacitive coupling clamp for Burst
CDN 163	Burst coupling network 100 A per phase (coupling all to ref ground)
CDN 117/118	Coupling networks for Signal-/Datenleitungen (Surge)
CAS 3025	Burst/EFT verification set
MD 200A	Voltage differential probe
MD 300	Current probe
Accessories for IEC/EN 61000-4-11	
INA 6501	Manual step transformer, 16 Aac, 0/40/70/80%
INA 6502	Automatic step transformer, 16 Aac, 0/40/70/80%
VAR 6501	Automatic variable transformer, 7.5 A
VAR 6502	Automatic variable transformer, 2 x 16 A
VAR 6503	Manual variable transformer, 7.5 A
Accessories for IEC/EN 61000-4-8/-4-9	
MFO 6501	Manual magnetic field option -4-8
MFO 6502	Automatic magnetic field option -4-8
INA 701	Magnetic field loop 1 x 1 m; with MFO max. 3.6 A/m -4-8; Surge* max. 1200 A/m -4-9
INA 702	Magnetic field loop 1 x 1 m ; with MFO max. 40 A/m -4-8; Surge* max. 1200 A/m -4-9 *) Pulse shape adapter INA 753 recommended to Surge generator
INA 753	Pulse shape adapter

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