



# NSG 3060 THE MODULAR SOLUTION FOR 6 KV APPLICATIONS



- **Modular, expandable system**
- **Surge voltage up to 6.6 kV allows over-testing**
- **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 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.

**Designed to fulfill requirements for CE mark and ANSI C62.41 testing**, the NSG 3060 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 3060 can completely fulfill the unique coupling requirements specified by ANSI C62.41. 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 3060. 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.

**With Expert Mode 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 3060 has an Ethernet port for external PC control.** The Windows-based control software simplifies 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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## THE MODULAR SOLUTION FOR 6 KV APPLICATIONS

The NSG 3060 performs tests according to the following specifications:

### Combination wave pulse 1, 2/50 - 8/20 $\mu$ s (Hybrid-Surge pulse)

Pulse conforms to IEC/EN 61000-4-5 and ANSI (IEEE) 62.41

| Parameter                      | Value   |
|--------------------------------|---|
| Pulse voltage (open circuit):  | $\pm 200$ V to 6.6 kV (in 1 V steps)              |
| Pulse current (short circuit): | $\pm 100$ A to 3.3 kA                             |
| Impedance:                     | 2/12 $\Omega$                                     |
| Polarity:                      | positive / negative / alternate                   |
| Pulse repetition:              | 10* .... 600 s (in 1 sec steps)<br>1 .... 10 min. |
| Test duration:                 | 1 to 9999 pulses, continuous                      |
| Phase synchronization:         | asynchronous, synchronous 0 to 359° (in 1° 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

### Ringwave 0.5 $\mu$ s/100 kHz

Pulse conforms to IEC/EN 61000-4-12 and ANSI (IEEE) C62.41

| Parameter                      | Value  |
|--------------------------------|--|
| Pulse voltage (open circuit):  | $\pm 200$ V to 6.6 kV (in 1 V steps)   |
| Pulse current (short circuit): | $\pm 16.6$ to $\pm 550$ A, $\pm 10\%$<br>$\pm 6.6$ to $\pm 220$ A, $\pm 10\%$<br>$\pm 1$ to $\pm 33$ A, $\pm 10\%$ |
| Impedance:                     | 12/30/200 $\Omega$   |
| Polarity:                      | positive / negative / alternate  |
| Pulse repetition:              | 10* .... 600 s (in 1 sec steps)<br>1 .... 10 min.  |
| Test duration:                 | 1 to 9999 pulses, continuous   |
| Phase synchronization:         | asynchronous, synchronous 0 to 359° (in 1° 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<br>±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   |
| Phase synchronization: | asynchronous, synchronous 0 to 359° (in 1° steps)   |
| Coupling:              | ANSI / IEC / external   |

### Dips & Interrupts

conforms to IEC/EN 61000-4-11, IEC/EN 61000-4-29

| Parameter                       | Value  |
|---------------------------------|--|
| Dips & Interrupts:              | From EUT voltage input to 0 V, 0% <sup>(1)</sup>                     |
| Uvar with optional variac:      | depending on model (VAR 3005)  |
| Uvar with step transformer:     | 0, 40, 70, 80% (INA 650x)  |
| 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 1999 s, 1 to 300 cycles or 1 to 3'000 $\frac{1}{10}$ cycles |
| Test duration:                  | 1 s to 70'000 min, 1 to 99'999 pulse, continuous                     |
| Repetition time:                | 40 μs to 35 min, 1 to 99'999 cycles                                  |
| Phase synchronization:          | asynchronous, synchronous 0 to 359° (in 1° steps)                    |

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

### Variation test (with VAR 3005 only)

conforms to IEC/EN 61000-4-11

| Parameter                  | Value  |
|----------------------------|--|
| Uvar with optional variac: | up to 265 V (in 1 V steps) or up to 115% U <sub>in</sub> (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);<br>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 70'000 min, 1 to 99'999 pulses, continuous                        |
| Phase synchronization:     | asynchronous, synchronous 0 to 359° (in 1° steps)                        |

# **NSG 3060**

## **THE MODULAR SOLUTION FOR 6 KV APPLICATIONS**

### **Pulsed magnetic field in conjunction with INA 753 and INA 701 or 702**

conforms to IEC/EN 61000-4-9

| <b>Parameter</b>       | <b>Value</b>                                      |
|------------------------|---|
| 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 $\Omega$  |
| 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 and INA 701/702/703**

conform to IEC/EN 61000-4-8

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

# NSG 3060

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### Technical specification

|                           |  |
|---------------------------|--|
| Instrument supply         | 85 to 265 VAC, 50/60 Hz                          |
| Dimensions NSG 3060 WxHxD | 449 (17.7") x 328 (12.9"; 7 HU) x 565 mm (22.2") |
| Weight NSG 3060           | 22 kg (48.5 lbs)                                 |

### Options

|                     |   |
|---------------------|---|
| CDN 3061-x16        | Single phase 270 V / 16 A automatic coupling decoupling networks  |
| CDN 3063-x32        | Three phase 480 V / 32 A automatic coupling decoupling networks   |
| CDN 3063-S63        | Three phase 480 V / 63 A automatic coupling decoupling network for Surge pulses up to 6,6 kV  |
| CDN 3063-S100       | Three phase 480 V / 100 A automatic coupling decoupling network for Surge pulses up to 6,6 kV                                       |
| CDN 3083-B100/ -200 | Manual 3-phase coupler for EFT / Burst (8 kV) only with EUT supply up to 690 VAC (1000 VDC) / 100 A / 200 A                         |
| CDN 3083-S100/ -200 | Manual 3-phase coupler for Surge (8 kV) only (combination and ring wave) with EUT current up to 100 A / 200 A                       |
| CDN 3425            | Burst EFT capacitive coupling clamp for data line coupling per IEC 61000-4  |
| CDN 117/118         | Coupling networks for signal-/data lines (surge)  |
| CDN HSS-2           | Coupling network for 2 kV surge pulse 1.2/50 $\mu$ s IEC/EN 61000-4-5 on unshielded symmetrical high speed telecom lines (Ethernet) |
| CAS 3025            | Burst/EFT verification set  |
| MD 200 / 200 A      | Voltage differential probe 3.5 kV / 7 kV  |
| MD 300              | Current probe 5 kA  |

### 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 3005-S16 | Automatic single variable transformer, 1 x 16 A |
| VAR 3005-D16 | Automatic double variable transformer, 2 x 16 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 coil 1 x 1 m; with MFO max. 3.6 A/m -4-8; Surge* max. 1200 A/m -4-9 |
| INA 702  | Magnetic field coil 1 x 1 m, with MFO max. 40 A/m -4-8; Surge* max. 1200 A/m -4-9  |
| INA 703  | Magnetic field coil 1 x 1 m; max. 330 A/m -4-8                                     |
| INA 752  | Pulse shape adapter for IEC 61000-4-9  |

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