

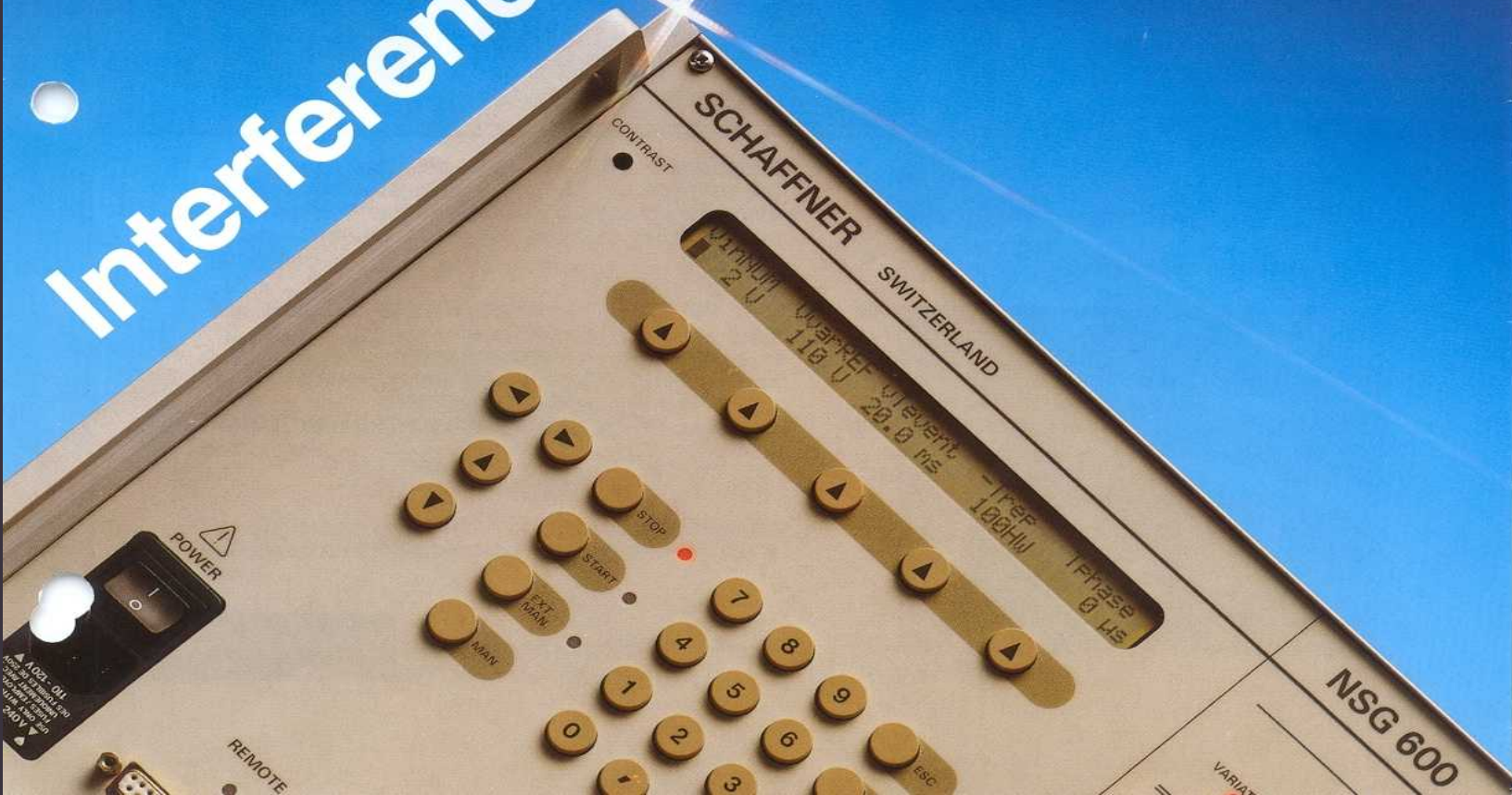


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SCHAFFNER

# NSG600

Interference Simulators System



SCHAFFNER SWITZERLAND  
MINI 2 U  
Vmax 110 U  
Iref 20.0 ms  
Iref 100mA  
Iref 10

NSG 600

# Interference Simulator System NSG 600

This very versatile system provides for the simulation of the most varied transient conditions which occur in AC and DC mains, but also has facilities to permit the application of transients without supply voltage. The system consists of a main frame and various plug-in units which generate the specific disturbances. The basic equipment contains:

- Main frame unit with centralized power supply and control for 1 to 4 plug-in units.
- Microprocessor controlled function keys and LCD display.
- Connection to the unit under test and pulse output.
- RS 232-C interface for computerized remote control.

The system and plug-in unit functions are programmed on the control panel and remain stored for later recall when required.

Standard functions are preprogrammed ex works and may be recalled or modified by use of the front panel key controls. The LCD display supports the dialogue with the user when setting the test sequences and shows the device status continuously.

The power electronics of the various test modules (mains failures, interference pulse generators etc) are incorporated in the plug-in units. These units are inserted from the rear into the main frame and are automatically connected to the control electronics and to the connector for the equipment under test. The plug-in units have facilities to provide connections for additional devices such as variac, artificial mains, 3-phase extensions etc.

The modular construction of the NSG 600 test system

allows for the assembly of individual test systems. With further plug-in units and options it promises to meet most future user requirements for interference simulation.

Complete and complex test sequences, according to various standards, may be run without changing test generators or without disrupting the power to the equipment under test.

A serial RS 232-C interface permits control of all system functions by means of an external computer. The computer also allows the dynamic parametering of the test procedure and the automatic logging of test processes and results, including failures of the unit under test.

The NSG 600 system is also especially suitable for automatic final tests.

In critical cases an opto-link option may be used to ensure undisturbed operation of the computer connected to the remote socket.

By use of a converter remote control is also possible via a GPIB (IEEE 488) Controller.

Examples of software and test programmes for MS-DOS are available to help users.

## Plug-in units

**NSG 603** Simulator for AC/DC mains voltage fluctuations and interruptions.

**NSG 622** Simulator for fast interference pulses and medium energy interference pulses.

Additional types of plug-in units for tests and requirements according to various standards (Burst, Mil, etc) are under development.





# NSG 600

## Technical Data

### System supply

- 110/220 V ( $\pm 20\%$ ) 50/60 Hz  
switchable on main frame,  
connection via 6 A equipment plug

### EUT supply

- 15 + 264 VAC  
15 + 65 Hz/16A max  
65 + 500 Hz/6 A max
- 5 + 50 VDC/16A max
- Connection via 16A equipment plug
- Decoupled against generated transient pulses being fed onto the supply network

### Test supply output

- Supply voltage with the selected interference superimposed via the mains socket (country specific) and safety banana plugs

### HV pulse output

- Pulses without supply voltage:  
Fischer 5 kV coaxial socket  
(e. g. for data line coupling devices)

### Remote control

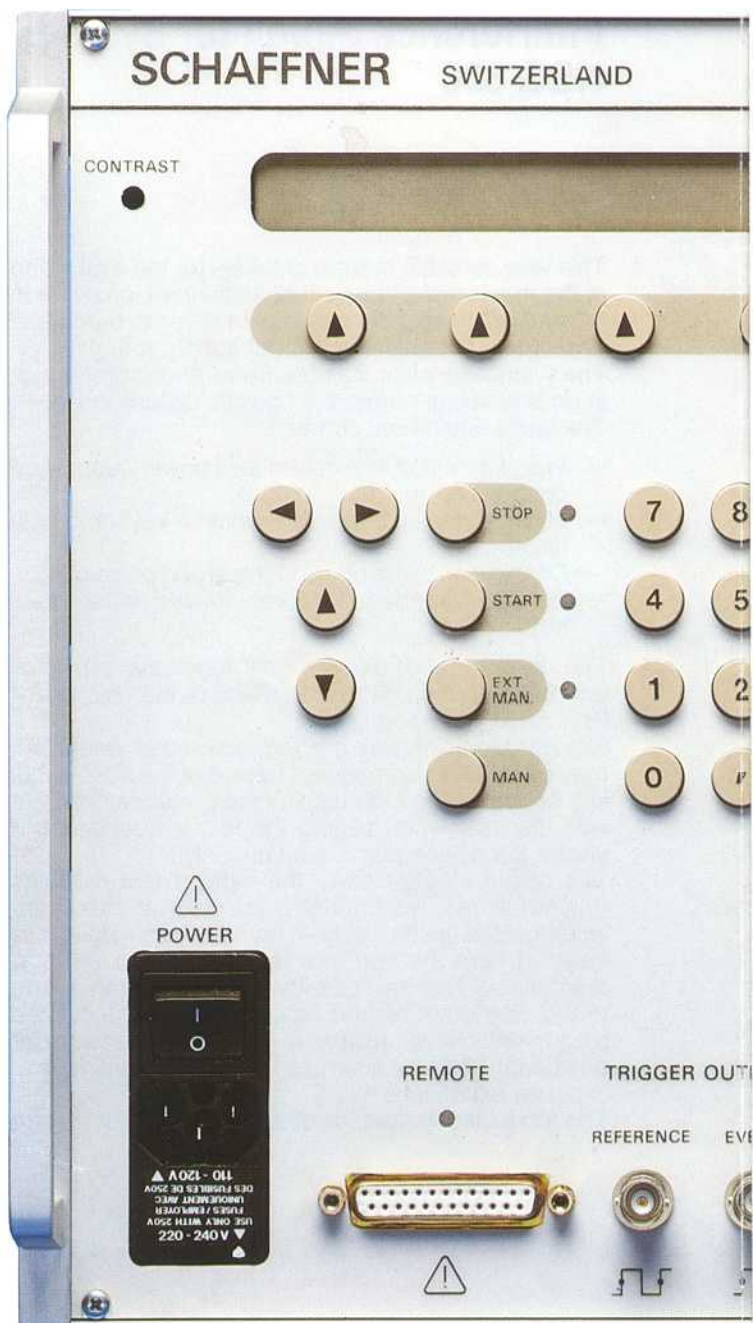
- RS 232-C interface with supply for opto-link: Cannon 25 pol.

### Plug-in outfit

- 1 to 4 pieces

### Dimensions

- Width 448 mm  
(mounting in 19' rack possible)
- Height 266 mm
- Depth 455 mm (without handles)
- Weight approx 20 kg



## Basic equipment NSG 600

Order no.	Country	Accessories (included)
NSG 600-01	D/S/NL/I/ E/N/SF	— Mains cable (Power) — Supply cable (Test supply input)
NSG 600-02	CH	— Manual
NSG 600-03	F/B	
NSG 600-04	USA/CAN/ Far East	
NSG 600-05	GB	

# NSG 600 INTERFERENCE TEST SYSTEM

Control panel with various buttons and indicators:

- Two triangular buttons at the top.
- Buttons labeled 9, 6, 3, +/-, ESC, SHIFT, CTRL, ENTER.
- Buttons labeled DUT FAIL, EXT. TRIG./GATE.
- MAX 12V label.

Control panel for VARIATION, DROPOUT, U VAR, U INPUT, OFF, and INTERFERENCE SIMULATION:

- Buttons for VARIATION, DROPOUT, U VAR, U INPUT, OFF.
- Buttons for ASYM, SYM, L1, E, L2.
- Buttons for PULSE OUTPUT, COUPLING, and PULSE.
- Buttons for DROPOUT VARIATION and INTERFERENCE SIMULATION.

Output and supply control panel:

- Buttons for PULSE OUTPUT, TEST SUPPLY OUTPUT, and TEST SUPPLY INPUT.
- Buttons for U VAR, U INPUT, OFF.
- Buttons for L1 > 10 V, L2 > 10 V.
- MAX 16 A label with a warning symbol.
- ON/OFF switch.
- L1, E, L2 labels with lightning bolt symbols.
- MAX 250 VAC 50 VDC 16 A label.

## Accessories (not included)

Order no.  
402-251

Measuring adapter 1000 : 1 with connections for oscilloscope (For other types than NSG 600-01 additionally adapter 402-270 is necessary)

INA 302

Interface RS 232-C - - IEEE 488 GPIB

402-227  
431-958

Safety banana plug set  
1 pair coaxial cables, 0.3 m, with Fischer HV plug

INA 303

Opto-link option  
10 m, with power supply 230 VAC

402-089

1 pair cables, 1 m, with HV plugs and banana plugs 4 mm

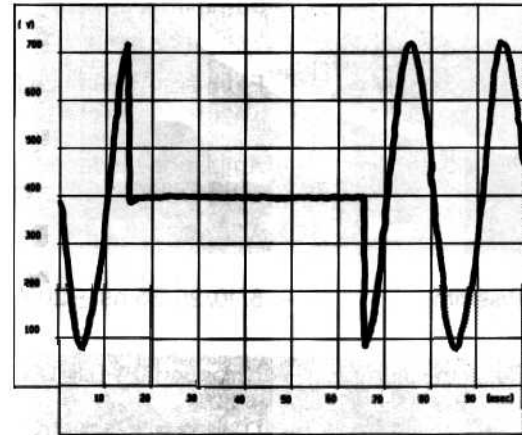
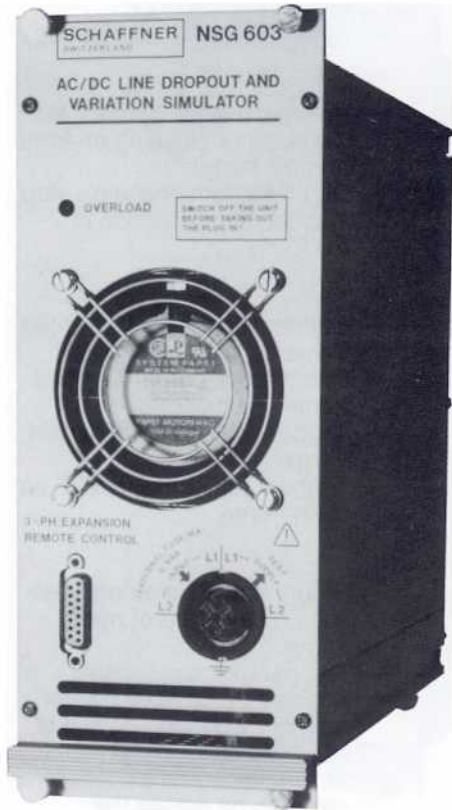
INA 304

Opto-link option  
10 m, with power supply 110 VAC

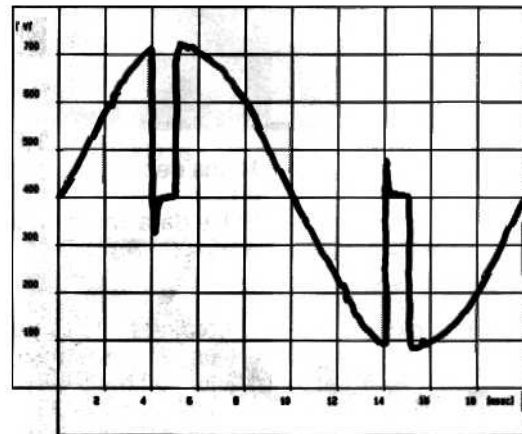
156-155

HV plug for cable 0 4.3 mm

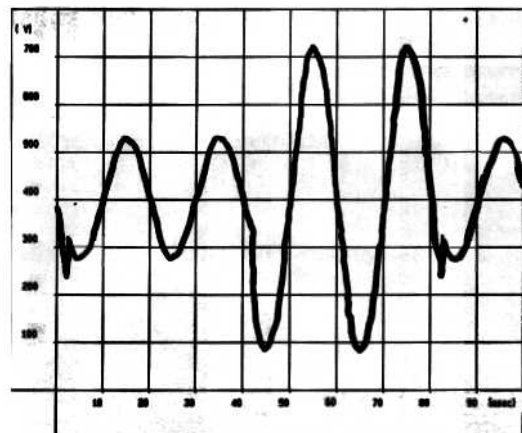
# NSG 603 A Plug-in unit



Drop out time 50 ms  
Phase delay 5 ms



Drop out at each half wave 1 ms,  
Phase delay 4 ms



Voltage variation,  
Low voltage 40 ms,  
Phase delay 2 ms

With the NSG 603 plug-in unit interruptions and voltage fluctuations on AC and DC mains can be simulated in accordance with generally known standards. Thanks to the use of state of the art semiconductor technology, power-MOS-FETs and microprocessor control, supply dropouts can be inserted at any desired phase angle. The respective times for repetition, drop out time and phase displacement can be programmed by the decimal keyboard and LCD display on the main frame or via remote control equipment.

For voltage variations a second voltage source (e. ~. motorized Variac, electronic AC-source, DC supply equipment) is connected on the rear side. A control output 0 + 10 VDC controls the additional source adjusting the outputs to the desired value, programmed on the main frame-unit.

Provision has been made on this equipment for the connection of a future 3-phase extension and an external switch with high breaking capacity.

The system has automatic overload protection to prevent damage to the NSG 600 from failure in the equipment under test.

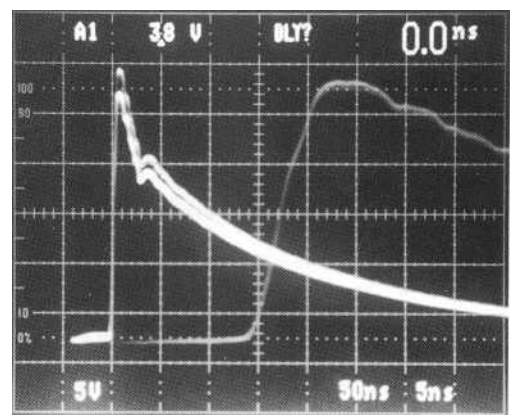
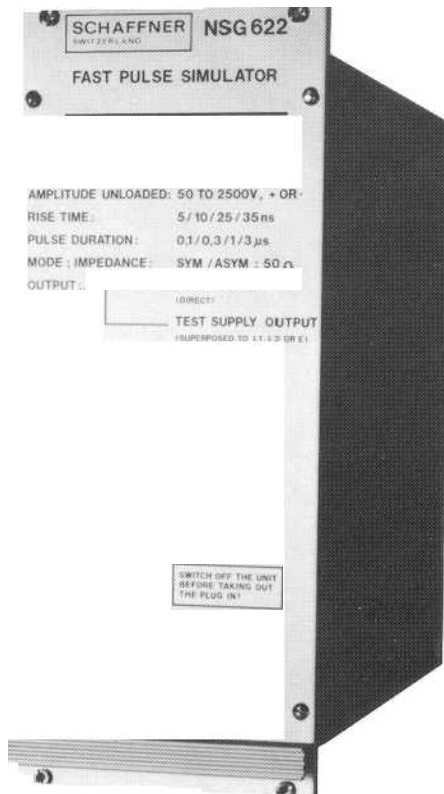


# NSG 603 A Technical data

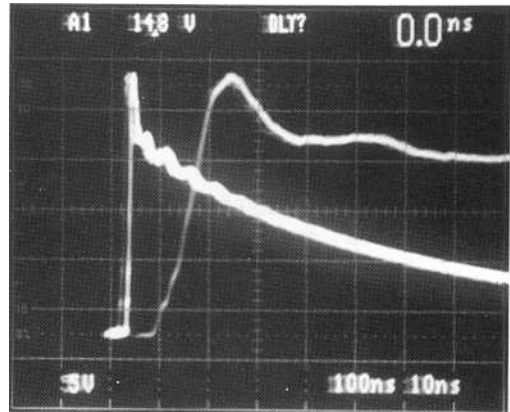
Construction	Standard plug-in unit, is inserted into NSG 600 main frame from the rear	Inputs	External trigger/gate for single shot or blocking, parallel to key on front of main frame DUT Fail for simulation stop in case of malfunctions of EUT
Power supply	From NSG 600 main frame		
EUT supply	AC: 10 ... 280 Vrms DC: 10 ... 50 V <sup>1)</sup>	Outputs	Connection for EUT on main frame Trigger OUT EVENT on main frame Trigger OUT REFERENCE on main frame
Frequency range	DC ÷ 500 Hz		
Current	AC max. 16 A up to 65 Hz max. 6 A up to 500 Hz DC max 10 A	Voltage measurement	Digital indication of power supply values for EUT on LCD display on main frame.
Threshold of electronic fuse	150 A at 20 µs current pulse 100 A at 100 µs current pulse 50 A at 1ms current pulse 25 A at DC	Rear side	Connection for second EUT power supply (Motorvariac, Variac, electronic AC-source, DC power supply) Control output for EUT power supplies, for 3-phase extension and for direct control of semiconductor circuits
Functions	Dropout, synchronous with mains Dropout asynchronous Inverse function as pulse, synchronous with mains Inverse function as pulse, asynchronous Variations, synchronous with mains Variations, asynchronous Mains ON Variable voltage ON Test item OFF Dropout with low impedance termination	Operation	Program and parameter setting on keyboard of main frame The parameters set remain memorized when the device is switched off All functions and parameters can also be set via the remote control interface on the main frame
Repetition time	Asynchronous 40 µs ÷ 130 s Synchronous 1 ÷ 64 000 half cycles	<b>Accessoires (included)</b>	Plug set for second EUT power supply
Dropout time	Asynchronous 20 µs ÷ 130 s Synchronous 20 µs ÷ 130 s (always smaller than repetition time)	<b>Options</b>	
Phase delay	Synchronous 0 ÷ 170 ms	NSG 641	AC supply variator
		NSG 633	3 phase dropout simulator

1) up to 350 V / 16 A if mechanical switch is not operated

# NSG 622 Plug-in unit



Pulse 5/100 ns



Pulse 10/300 ns

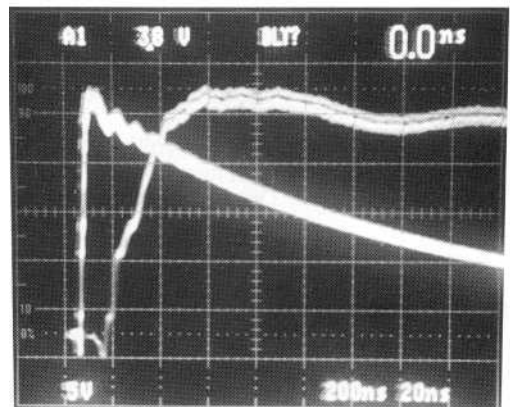
The NSG 622 plug-in unit generates fast to medium-speed interference pulses such as are produced by mechanical and electronic switches, relays etc. These pulses have a very short rise time and thus a broadband interference spectrum. In spite of their relatively low energy it is this sort of pulses which cause the most frequent malfunctions in digital circuits of all kinds. The high repetition frequency of the pulses, up to 60 Hz, makes it possible to obtain a reliable test result after a short testing time.

The precise adjustment of the pulse parameters enables the development engineer to optimize the equipments. The defined digital display of pulse data permits precise operation without oscillographic monitoring.

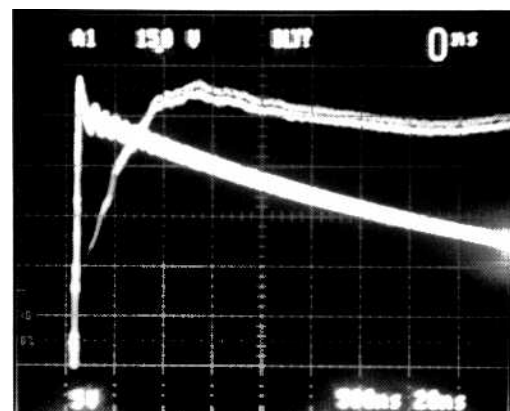
The various adjustable pulse parameters allow tests to be made in accordance with the most widely differing standards, e.g. EG standard EEC 4517/79 Com. (78) 766 final, standard for «Weighing trade», STD 2793/01 and many existing standards of individual companies.

The adjustable pulse width of 0.1 to 3 μs is ideal for investigation of the attenuation performance of mains filters.

The setting of 5 ns/300 ns allows practical NEMP tests (mains or signal-lines) up to 2.5 kV.



Pulse 25/1000 ns



Pulse 35/3000 ns

# NSG 622 Technical data

Construction	— Standard plug-in unit, is inserted into NSG 600 main frame from the rear	Phase angle	— Synchronous, delay adjustable from 100 $\mu$ s to 99 ms with reference of 0° — Asynchronous (free running)
Power supply	— From NSG 600 main frame	Inputs	— External trigger/gate for single pulse or blocking on front of main frame — DUT FAIL for simulation stop in case of malfunction of EUT
Pulse data	— Amplitude unloaded $\pm$ 50 to 2500 V, in steps of 20 V	Outputs	— Connection for EUT on main frame — Direct pulse output on main frame — Trigger Out EVENT on main frame — Trigger Out REFERENCE on main frame
Rise time	— 5/10/25/35 ns $\pm$ 20%	Operation	— Program and parameter setting on keyboard of main frame — The parameters set are retained in the main frame memory when the device is switched off — All functions and parameters can also be set via the remote control interface on the main frame
Pulse duration	— Unloaded 0.1/0.3/1/3 $\mu$ s $\pm$ 20% — Loaded with 50 ohms: approx 70% of unloaded value		
Internal impedance	— 50 ohms $\pm$ 10%		
Coupling	— Single phase sym. P/N asym. P+N/E asym. P+N+E/HF-earth unsym. P or N or E/HF-earth — Mains decoupling incorporated — Pulse data variation with network <20%		
Repetition	— According to pulse duration 0.1 $\mu$ s 15 ms $\div$ 99 s 0.3 $\mu$ s 30 ms $\div$ 99 s 1 $\mu$ s 100 ms $\div$ 99 s 3 $\mu$ s 200 ms $\div$ 99 s Externally via BNC input or via single pulse key on main frame	<b>Accessories (not included)</b> — Coupling clamp according to IEC 801-4: CDN 125 — 3-phase coupling network: CDN 300	

Subject to change without notice

## International sales and production subsidiaries

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