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EMC

NSG 203 A

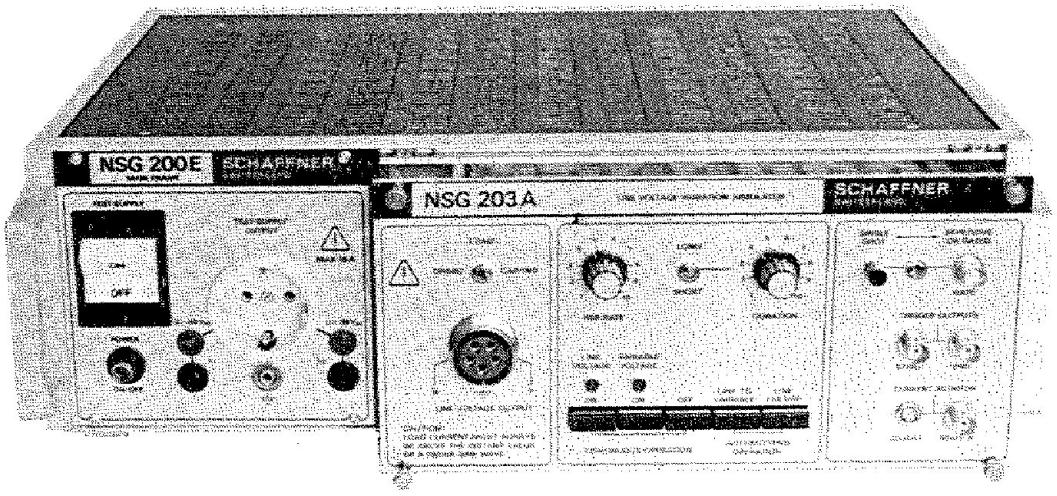
BEDIENUNGSANLEITUNG
STÖRSIMULATOR

MANUAL
INTERFERENCE SIMULATOR

SCHAFFNER

Plug-in unit

NSG 203 A



Printed Mai 1990

1. Introduction

Using the NSG 200 series of instruments, different types of line interference can be simulated. These instruments use plug-in units for different types of interference.

New plug-in units will correspond to different national and international standards and will reflect the latest technology.

The instruments consist of a main frame NSG 200 C or D and different plug-in units.

The following units are available:

MAINFRAME	NSG 200 C or NSG 200 D	contains line switches, line filter, fuses and other elements
PLUG-IN	NSG 203 A	simulates short variations and interruptions in line voltage
	NSG 204	simulates DC line interruptions
	NSG 222	simulates short pulses with fast rise time
	NSG 223	simulates 50 µsec. interference pulses with high energy
	NSG 224	simulates pulses with medium energy and rise time
	NSG 226	Data line interference simulator

2. Description

The NSG 203 A can be used to simulate short variations in line voltage or line failures. The line voltage may for example decrease for a few seconds from 220 (110) volts to 110 (55) volts or increase for 10 (8,3) msec. from 220 (110) volts to 600 volts. For this operation a single external variable voltage transformer is needed.

The maximum output voltage for the NSG 203 A is 600 V A.C. (RMS).

For simulating a variation from a high voltage to an abnormally low voltage (for example, if one voltage is 150V, the other 280 V), two external variable voltage transformers are needed. Cables to these transformers with corresponding connectors are available as NSG 322 (one transformer) and NSG 323 (two transformers).

A line failure or voltage variation will always start at zero crossing. The line failure can be terminated at an arbitrary moment, the line variation only at a zero crossing. The duration of the line variation is therefore always a multiple of 10 (8,3) msec..

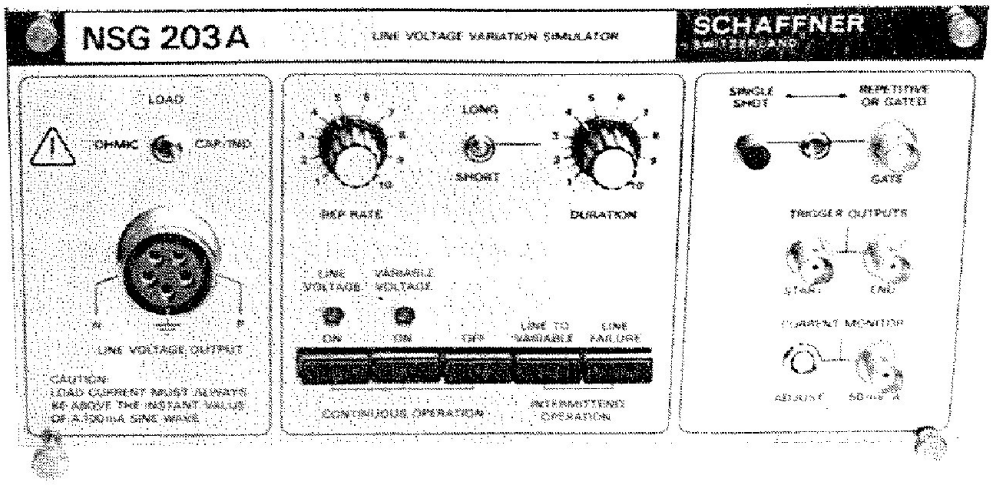
Line failures or line voltage variations occur in regular intervals. If however a logic 0 level (TTL) or a closed electromechanical contact is applied to the "gate" terminal no failures or variations will occur. Using an electromechanical timer with output applied to the gate terminal the duration or number of failures or variations can be preselected.

Using the push button a single event can be obtained if the switch is in the "single shot" position.

Trigger pulses are supplied to an oscilloscope. One pulse (Start) will occur at the start of failure or variation, the other (End) at termination. Using the current transformer it is possible to observe the change in output current at two moments.

The NSG 203 A connot be operated without a load. In order to actuate the zero crossing detector the load current should not (even at low supply voltages) drop below 100 ma.

2.1 The front panel



A.) Push buttons

If the push button "line voltage" is engaged, a voltage will appear at the main frame front panel terminals:

Using the dummy connector or one variable voltage transformer	:	The line voltage
Using two variable voltage transformers	:	The output voltage of the second variable voltage transformer

If the push button "variable voltage" is pressed, a different voltage will appear at these terminals:

Using the dummy connector	:	no voltage
Using one or two variable transformers	:	Output voltage of first variable transformer

If the push button "off" is engaged, no voltage will appear between the front panel terminals of the NSG 200 C.

In order to simulate a short time line failure the button "line failure" must be engaged.

Voltage variations can be simulated if the button "line to variable" is pressed. The voltage on the main frame terminals will now change:

Using one variable transfomer and cable NSG 322	:	between line voltage and the output voltage of the variable transformer
Using two variable transformers and cable NSG 323	:	between the output voltages of the two variable transformers

WARNING: Any transformer should have appropriate fuse (max 16A fast) in its output line to the NSG 203 A.

B.) Switch : Load adaptation "ohmic-capacitive-inductive"

With an ohmic load the switch should be placed on "ohmic".
With an inductive or capacitive load there is a danger that one triac might fire before the other has become non conducting. This might lead to a large current and trigger the electromechanical fuse in the NSG 200 C main frame. Placing the switch on "inductive-capacitive" will increase the time interval between zero crossing and firing of the triac during voltage change. This will effectively prevent the danger of both triacs becoming conductive at the same time.

WARNING: The position "inductive-capacitive" should be used when ever possible.

C.) Knob "Duration" — determines the length of the line failure or on "voltage variation" the time during which the voltage coming from the first variable voltage transformer will appear on the main frame terminals.

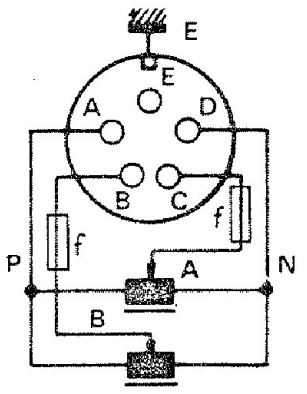
D.) Knob "Rep.-Rate" — determines time interval between line failures or line voltage variations.

E.) Switch "long/short" — changes the range of intervals controlled by the "duration knob".

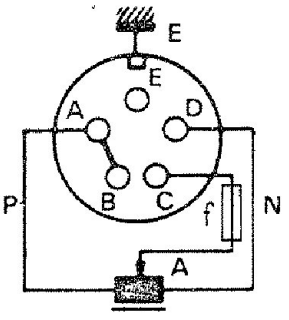
F.) Plug socket "Line Voltage Output"

The following may be connected to this socket:

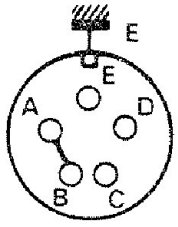
a) A dummy connector: for the simulation of line failure
b) Cable NSG 322 : for use with one variable transformer
c) Cable NSG 323 : for use with two variable transformers



NSG 323



NSG 322



Dummy Connector
f= Fuse ≤16 A fast

Color code used in NSG 322 and NSG 323 cables:

E Earth lead	green/yellow	B Tap 1	white
D Neutral	yellow	C Tap 2	black
A Phase	red		

G.) Switch: "Repetitive/ single shot"

Position "Repetitive" :

- Line failures or variations will recurr in regular intervals
- Repetition of line failure or variation is blocked by applying a logic 0-signal to the terminal (TTL) or electromechanical contact
- External single shot is possible with "Gate"signal logig "0" and short "1" pulses to release one line failure or variation.

Position "single shot" :

- One line failure or variation is released by pressing the button "single shot".

H.) Trigger Output

Start

At this terminal a trigger pulse will appear at the start of a line failure or voltage variation

End

At this terminal a trigger pulse will appear at the end of a line failure or line variation

I.) Current Monitor

Using the internal isolating current transformer a voltage that is proportional to the output current will appear at this terminal, 50 mV corresponds to 1 Amp.

Using the NSG 203 A equipment can be tested to the following test specifications:

Mil Std 704 A (Fig.2), Mil Std E 4158 (Table II- Fig. 1)
BS 4509/4525, CEE (Sekr. 229) UK 121
EEC Com. (78) 766 final
VDE 0160 § 8 and British specification CE GB - EES (1970).

3. Technical Information

3.1 Electrical data

Line voltage	:	220/240 V - 50 Hz
Option	:	110 V - 60 Hz
Max. Rated current through line filter	:	16 Amp. / 50 Hz (60Hz)
Max. voltage across load	:	600 V~

Line failure

Duration of the failure short:		1.5 msec - 30 msec
Duration of the failure long :		25 msec - 500 msec
Interval between failures	:	0.6 sec - 25 sec

Line voltage variation

Duration of interval with changed line voltage short	:	10 msec - 300 msec
long	:	0.25 sec - 5 sec
Interval between changes	:	0.6 sec - 25 sec

Interval between the different voltage levels (during this interval the line voltage is zero)		
Position of load switch: ohmic		0.5 msec
cap./ind	:	1 msec

Output Trigger ("Start" and "Stop")

Amplitude	:	+ 10 V
Duration	:	1.5 msec
Current transformer	:	50 mV/ Amp.
Signal level for gate	:	⌐⌐ "Log 0" (TTL) or electro-mechanical switch (relay)
Interference level (VDE)	:	< N

3.2 Mechanical data

Weight	:	5.2 kg
Dimensions	:	265 x 130 x 340 mm

4. Operating instructions

Operating mode:	Accessories:
Line failure	Dummy connector (supplied with instrument)
Constant line voltage changing to variable voltage	NSG 322 cable* and one variable voltage transformer**
One variable voltage changing to a second variable voltage	NSG 323 cable* and two variable voltage transformers**

*) Not included with NSG 203 A, must be ordered separatly

**) Variable voltage transformers are nor included with NSG 203 A, must be ordered from manufacturer of variable voltage transformers

Line failures or line voltage variations can be made to occur single shot, repetitivly or in a gated mode.

Attention: The NSG 203 A simulator cannot be operated without a load, care should be taken to insure a load current of at least 100 ma, even at lowest voltage setting.

The NSG 203 A has to be adjusted for the mains frequency. It is not possible to work with other frequencys than the unit is ordered for.

Do not use for the NSG 203 A the external Inputs of the NSG 200 C/D.

Any transformer used with the NSG 203 A should have appropriate fuse (max.16A fast) in its output line to the NSG 203 A.

It is not possible to use the NSG 203 A in any kind of 3-phase mains.

If a 50 Hz instrument should be used for 60 Hz or a 60 Hz instrument for 50 Hz change the following time settings:

The time of OS IC 9 has to be changed on the timing unit 3.31.868 as follows:

working with: 50 Hz: 9.9 $^{+\ 0\ \text{ms}}_{-\ 0.1\text{ms}}$

60 Hz: 8.2 $^{+\ 0\ \text{ms}}_{-\ 0.1\text{ms}}$

Adjust this time by working without a transformer on mode position "line voltage on" with a load of at least 0,1 A.

5. Block diagram NSG 203 A

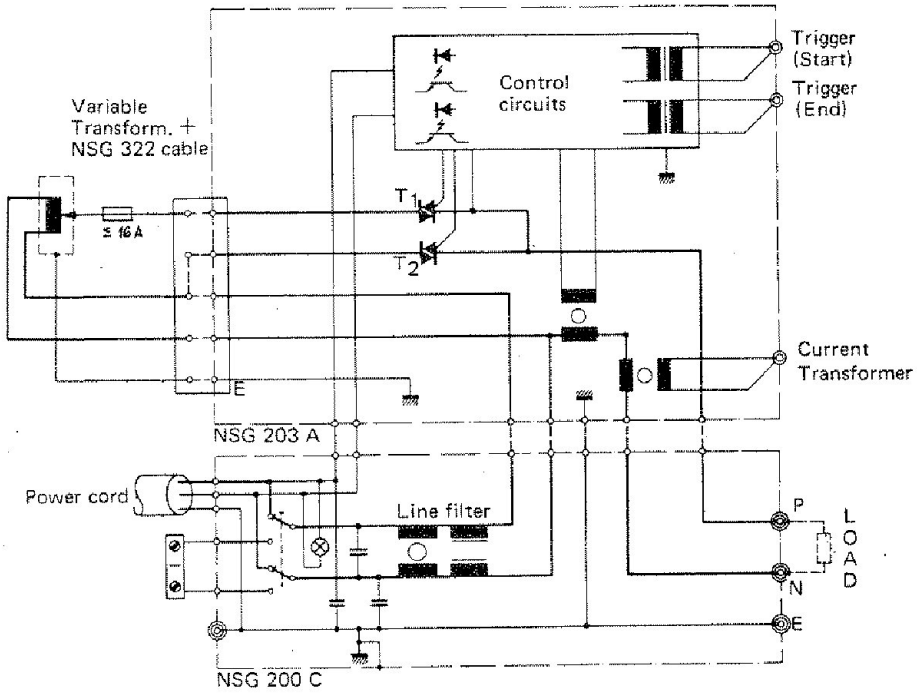


Fig. 3.3 Connections for one variable supply voltage (one variable transformer + NSG 322 cable)

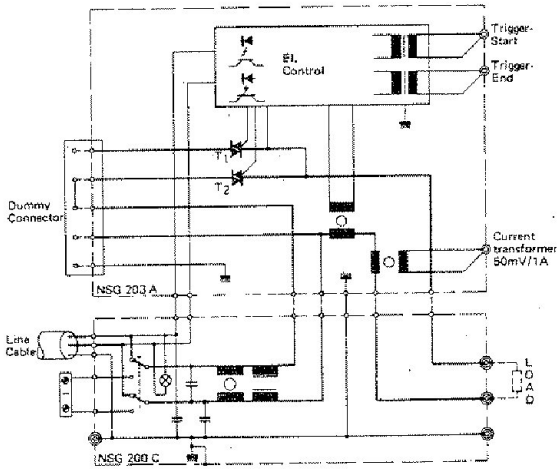


Fig. 3.4 Connection for simulation of line failure (using dummy connector supplied with simulator)

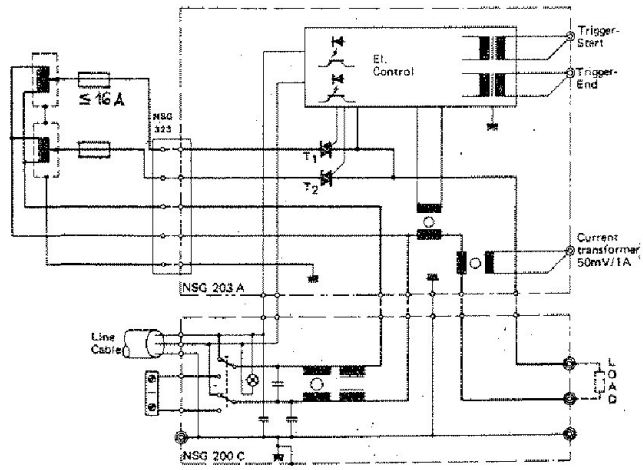


Fig. 3.5 Connection if both supply voltages must be variable (two ext. variable transformers + NSG 323 cable)

5.1 The block diagram

The neutral conductor N passes first through the main frame NSG 200, it does then enter the NSG 203 A plug in where it passes through two current transformers. It is then returned to the terminal N on the front panel of the main frame.

The live conductor P, after passing through the line filter of the main frame enters the plug in.

In the "line failure" mode it is then connected to a triac and from that triac goes back to the terminal P on the front panel of the main frame. The triac will then either block or pass current in live conductor.

In the "line variation" mode the live conductor might be first connected to a variable voltage transformer. The output of that transformer is then connected to a triac and then to the P terminal.

The electronic control circuits will fire the triacs at the proper moment. As reference it uses the zero crossing of the current in the neutral (N) conductor. The control circuitryis decoupled from the power circuit using an opto coupler.

The user should make sure that the neutral conductor is really connected to the N terminal. (If the N terminal is connected to 220 volts then the "Terminal N live" indicator will light up.

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