

# OCS 500N6F SERIES

## SIMULATOR FOR FAST AND SLOW DAMPED OSCILLATORY WAVES AND RINGWAVE



### FOR TESTS ACCORDING TO ...

- › ANSI/IEEE C37.90
- › ANSI/IEEE C62.41
- › EN 61000-4-10
- › EN 61000-4-12
- › EN 61000-4-18
- › IEC 60255-22-1
- › IEC 60255-26
- › IEC 61000-4-10
- › IEC 61000-4-12
- › IEC 61000-4-18
- › IEC 61000-6-5
- › IEC 61850-3
- › IEC 62052-11

### OCS 500N6F.X - COMPACT TESTERS FOR FAST/SLOW DAMPED OSCILLATORY WAVES AND RINGWAVE

The OCS 500N6F series includes the test capabilities for fast damped oscillatory waves at 3 MHz, 10 MHz and 30 MHz up to 4.4kV and is extendable for slow damped oscillatory waves at 100 kHz / 1 MHz up to 3.0 kV (as per EN/IEC 61000-4-18) and for ringwave up to 6 kV as per EN/IEC 61000-4-12.

Damped Oscillatory Waves are repetitive transients mainly occurring in power, control and signal cables installed in high voltage and medium voltage stations, divided into slow and fast damped oscillatory waves. The Ringwave is a non-repetitive damped oscillatory transient occurring in low-voltage power, control and signal lines supplied by public and non-public networks.

#### HIGHLIGHTS

- › Fully automated single box test system
- › Single DUT port
- › Fast Damped Oscillatory Waves up to 4.4 kV
- › Slow Damped Oscillatory Waves up to 3 kV (option)
- › Ringwave up to 6 kV (option)

#### APPLICATION AREAS

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|--|--|
|  INDUSTRY   |  RESIDENTIAL      |
|  COMPONENTS |  RENEWABLE ENERGY |
|  MEDICAL    |  |
|  BROADCAST  |  |

**TECHNICAL DETAILS**

**MODEL SELECTION**

**THREE IN ONE - THE OCS 500N6F COMBINES DAMPED OSCILLATORY WAVES AND RINGWAVE (OPTIONAL)**

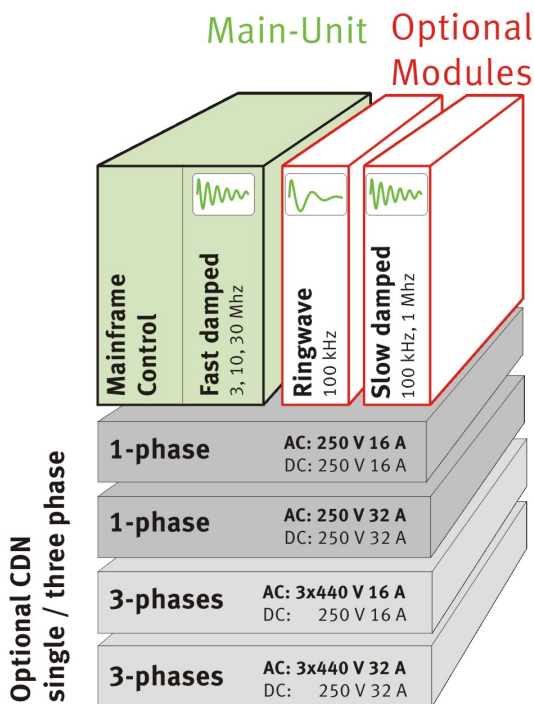
The basic equipment includes the fast damped oscillatory generator with 3 MHz, 10 MHz and 30 MHz for up to 4.4 kV acc. IEC 61000-4-18.

The OCS 500N6F comes with a built-in coupling/decoupling network for either single phase or three-phase and is rated for currents of 16 A or 32 A per line.

Optional Modules:

Slow Damped Oscillatory Waves with 100 kHz / 1 MHz reach up to 3kV. The module comply with EN/IEC 61000-4-18 and also with the requirements to test protective relays as per ANSI/IEEE C39.70.

Ringwave Module with capability of up to 6 kV complies with the Ringwave requirements of IEC 61000-4-12 ANSI/IEEE C62.41 standard.



**OPERATION**

**EASY TO OPERATE**

Front panel menu and function keys enable the user to program his test routines quickly and accurately. The cursor allows fast control of all test parameters of the programmed routine, thus test procedures are simplified and confidence is generated that every step is carried out correctly.

The operating concept em.flow distinguished by the following benefits:

- › Extremely easy to operate
- › Parameters can be set even during the test
- › Quick start
- › Standard programs
- › User programs
- › Select directly from standard test levels
- › Statistical test options
- › Predefined tests



**TECHNICAL DETAILS**

**SOFTWARE**

**IEC.CONTROL SOFTWARE FOR CONTROL AND DOCUMENTATION**

Outstanding user convenience, clearly structured windows and operation features and the EM TEST standards library along with the flexibility to generate user specific test sequences very easily are the main features of iec.control software. The software is automatically configured according to the connected EM TEST generators. Extensive reporting capabilities help the user to create test reports that meet international requirements.

iec.control is supported by Windows XP, Windows Vista, Windows 7 and Windows 8. Remote control is achieved either via opto-link or GPIB. iec.control supports a wide range of GPIB cards both of National Instruments.



**AUXILIARY DEVICES**

**CNV 504N4/N5 SERIE - COUPLING NETWORK FOR SIGNAL/DATA LINES (S-DOW/N6F REQUIRED)**

CNV 504N5.1 and CNV 504N5.3

The CNV 504N5-series coupling/decoupling networks are used to apply slow damped oscillatory waves with a frequency of 100 kHz or 1 MHz onto signal/data lines in accordance to IEC/EN 61000-4-18.

CNV 508N4 and CNV 508N4.1

The CNV 508N4 series are special coupling/decoupling networks being used to perform "Electrical disturbance tests for measuring relays and protection equipment" in accordance to IEC 60255-26.

The coupling/decoupling network is equipped with 4-pairs (8 wires) for the application on to signal/data lines.



**CNV504N5.1**



**CNV508N4**

**TECHNICAL DETAILS**

**ACCESSORIES**

**MFC 1000.X - MAGNETIC FIELD COIL FOR DAMPED OSCILLATORY MAGNETIC FIELDS (S-DOW/N6F REQUIRED)**

The MFC 1000.x is a 1\*1 sqm magnetic field coil as specified in IEC/EN 61000-4-10. Its design allows easy moving of the coil. The field coil is adjustable in height and allows for 360 degr rotation.

The MFC 1000.x is directly connected to the corresponding HV output of the OCS 500N6F to generate damped oscillatory magnetic fields as per IEC/EN 61000-4-10, up to level 5.



**MODEL OVERVIEW**

**OCS 500N6F MAIN-UNIT MODELS**

OCS 500N6F	With built-in CDN AC 250 V / 16 A DC 250 V / 16 A
OCS 500N6F.1	With built-in CDN AC 250 V / 32 A DC 250 V / 32 A
OCS 500N6F.2	With built-in CDN AC 3x440 V / 16 A DC 250 V / 16 A
OCS 500N6F.3	With built-in CDN AC 3x440 V / 32 A DC 250 V / 32 A

**OCS 500N6F MODELS FOR RCCB TESTING**

OCS 500N6F.4	With built-in CDN AC 3x440 V / 32 A DC 250 V / 32 A, calibration acc. IEC 61008-1 and IEC 61009-1
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## TECHNICAL DETAILS

FAST DAMPED OSCILLATORY  
MODULEFAST DAMPED OSCILLATORY WAVES AS PER IEC/EN  
61000-4-18

Voltage (o.c.) at HV output	450 V - 4,400 V $\pm$ 10%
Rise time	5 ns $\pm$ 30%
Oscillation frequencies	3 MHz, 10 MHz and 30 MHz, $\pm$ 10%
Decaying	Peak 5 to be $>$ 50% of peak 1 value Peak 10 to be $<$ 50% of peak 1 value
Source impedance	50 ohm $\pm$ 20%
Coupling	common mode
Polarity	Positive, negative
Repetition rate	Max. 5,000 /s $\pm$ 10%
Burst duration	50 ms $\pm$ 20%, at 3 MHz 15 ms $\pm$ 20%, at 10 MHz 5 ms $\pm$ 20%, at 30 MHz
Burst period	300 ms $\pm$ 20%
Short-circuit current	9 A - 88 A $\pm$ 20%
Rise time current waveform	$<$ 330 ns at 3 MHz $<$ 100 ns at 10 MHz $<$ 33 ns at 30 MHz
Decaying (current)	Peak 5 to be $>$ 25% of peak 1 value Peak 10 to be $<$ 25% of peak 1 value

SLOW DAMPED OSCILLATORY  
MODULE (OPTION S-DOW/N6F)SLOW DAMPED OSCILLATORY WAVES AS PER IEC/EN  
61000-4-18 (OPTION S-DOW/N6F)

Voltage (o.c.) at HV output	250 V - 3,000 V $\pm$ 10%
Voltage (o.c.) at line output	250 V - 2,500 V $\pm$ 10%
Rise time	75 ns $\pm$ 20%
Oscillation frequencies	100 kHz and 1 MHz $\pm$ 10%
Decaying	Peak 5 to be $>$ 50% of peak 1 value Peak 10 to be $<$ 50% of peak 1 value
Source impedance	200 ohm $\pm$ 20%
Polarity	Positive, negative
Repetition rate	Max. 50 /s for 100kHz and Max. 500 /s for 1MHz
Burst duration	At least 2 s

RINGWAVE MODULE (OPTION  
RWG/N6F)RINGWAVE AS PER IEC/EN 61000-4-12 AND ANSI/IEEE  
C62.41 (OPTION RWG/N6F)

Voltage (o.c.)	250 V - 6,000 V $\pm$ 10%
Rise time	0.5 us $\pm$ 30%
Oscillation frequency	100 kHz $\pm$ 10%
Decaying	Ratio of peak 2 to peak 1: 0.4 - 1.1 Ratio of peak 3 to peak 2: 0.4 - 0.8 Ratio of peak 4 to peak 3: 0.4 - 0.8
Source impedance	12 ohm and 30 ohm $\pm$ 20%
Peak current (s.c.)	Max. 500 A @ 12 ohm or Max. 200 A @ 30 ohm internally
Rise time	0.2 us to 1.0 us
Oscillation frequency	100 kHz $\pm$ 10%
Polarity	Positive, negative
Repetition rate	1 / min or faster

## TECHNICAL DETAILS

## GENERAL SPECIFICATION

## TRIGGER CIRCUIT

Release of pulses	Automatic, manual, external
Synchronization	0° - 360°, resolution 1°

## OUTPUT

Direct	Via HV-safety lab connectors
Coupling mode	Line to line Line(s) to ground (PE)
DUT supply	
OCS 500N6F	AC: 250 V / 16 A; 50/60 Hz DC: 250 V / 16 A
OCS 500N6F.1	AC: 250 V / 32 A; 50/60Hz DC: 250 V / 32 A
OCS 500N6F.2	AC: 3x440 V / 16 A; 50/60 Hz DC: 250 V / 16 A
OCS 500N6F.3	AC: 3x440 V / 32 A; 50/60 Hz DC: 250 V / 32 A
OCS 500N6F.4	AC: 3x440 V / 32 A; 50/60 Hz DC: 250 V / 32 A
CRO trigger	5V trigger signal for oscilloscope

## MEASUREMENTS

Ring wave	Peak voltage and peak current in LCD
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## TEST ROUTINES

Quick Start	Immediate start; easy-to-use and fast
Standard Test routines	As per IEC 61000-4-18 As per IEC 61000-4-12, Level 1 - 4 Manual Standard Test routine As per ANSI/IEEE C62.41 As per IEC 61000-4-10, Level 1 - 5
User Test routines	Change polarity after n pulses Change coupling after n pulses Change voltage after n pulses Change phase angle after n pulses

## GENERAL DATA

## INTERFACE

Optical interface	Opto link, 3 m cable USB A connector
Parallel interface	IEEE 488, addresses 1 - 30

## GENERAL DATA

Dimensions, weight	19" / 9 HU, approx. 32 kg (1-phase) 19" / 9 HU, approx. 50 kg (3-phase)
Supply voltage	115/230 V +10/-15%
Fuses	2 x T2AT (230V); 2 x T4AT (115V)
Temperature	10° C to 35° C
Rel. humidity	Max. 85%, non condensing
Atmospheric pressure	86 kPa (860 mbar) to 106 kPa (1,060 mbar)

## OPTIONS

## PULSE-MODULS

S-DOW/N6F	Extension module for OCS 500N6F series to generate slow damped oscillatory waves 100kHz and 1MHz as per IEC 61000-4-18
RWG/N6F	Extension module Ringwave 6.0kV as per IEC 61000-4-12 and ANSI/IEEE C62.41 for OCS 500N6F series

## TECHNICAL DETAILS

## OPTIONS

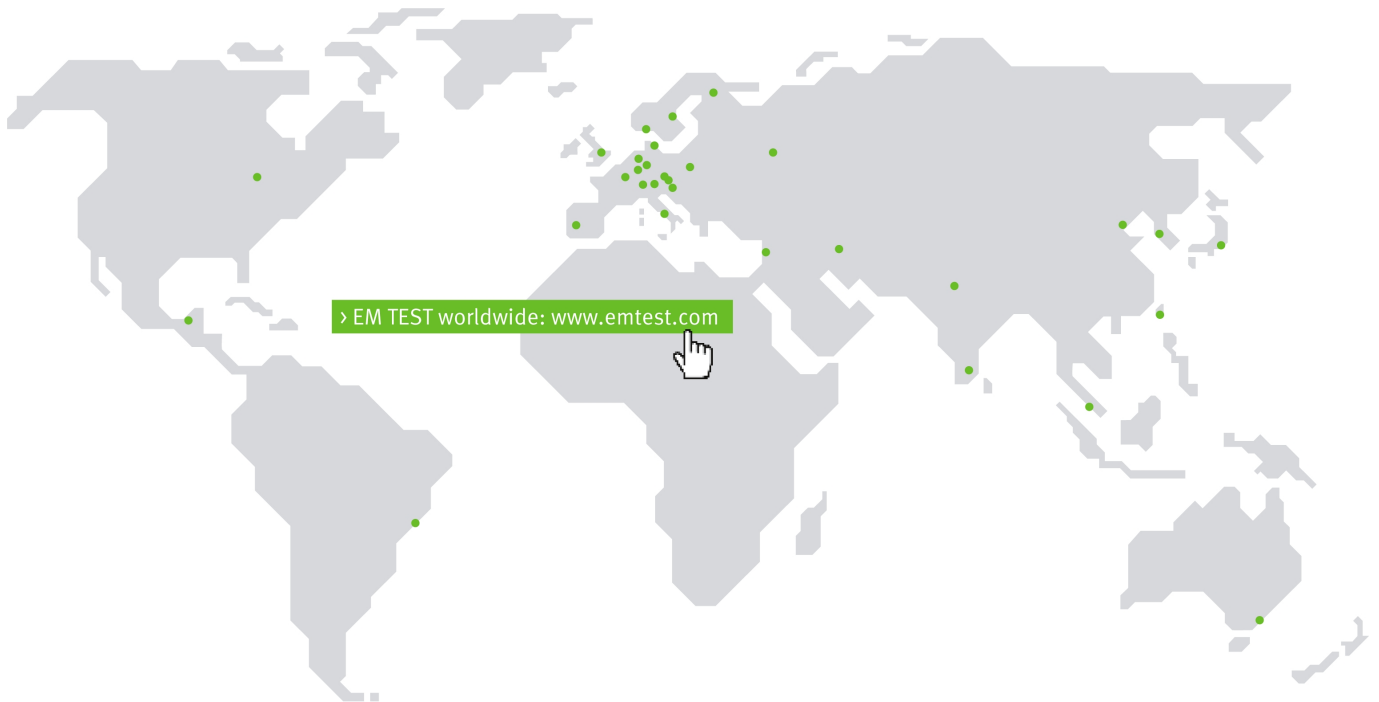
### ACCESSORIES COUPLING NETWORK

CNV 504N5.1	Coupler for 4 signal/datalines for damped oscillatory waves 100kHz and 1MHz as per IEC 61000-4-18, 50 V / 4 A
CNV 504N5.3	Coupler for 4 signal/datalines for damped oscillatory waves 100 kHz and 1 MHz as per IEC 61000-4-18, 250 V / 4 A
CNV 508N4	Coupler for 4 pairs (8 wires) as per IEC 60255-26, 250 V / 4 A
CNV 508N4.1	Coupler for 4 pairs (8 wires) as per IEC 60255-26, 250 V / 16 A
CCI	Capacitive coupling clamp as per IEC 61000-4-4
MFC 1000.x	Magnetic Field coil for IEC/EN 61000-4-10 application

### ACCESSORIES SOFTWARE, VERIFICATION

iec.control	Remote control and documentation software with library of standards
CA OCS F Kit	Load resistor set for fast damped oscillatory wave verification, KW OR1 load resistor 0.1ohm, KW 1000 load resistor 1000ohm, CA MC F Adapter to match KW OR1 and KW 1000 to the supply output of the OCS 500N6F

# COMPETENCE WHEREVER YOU ARE



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Information about scope of delivery, visual design and technical data correspond with the state of development at time of release. Subject to change without further notice.