



## MAIN FEATURES

- **Wide Power Bandwidth: DC - 5 kHz**
- **Output Power up to 90 kVA AC / 110 kW DC**
- **Output up to 3x690 VAC (p-p), ±1120 VDC**
- **High Inrush Current Capability**
- **Power-recovery up to nominal power (optional)**
- **Built-in Signal Waveform Generator**
- **Standard Test Routines for IEC/EN, Aircraft, MIL-STD, DO-160 and EV testing**
- **Multi Source options available (upgradable)**

## NetWave 90 Series Electronic Power Source

The NetWave Series (3-phase) are three-phase AC/DC power source, specifically designed to fully meet the requirements as per the standards IEC/EN 61000-4-13, -4-14, -4-28 and in addition to pre compliance testing to -4-27.

It is also used as a DC power source to cover the requirements as per the standards IEC/EN 61000-4-17 (Ripple on DC) and IEC/EN 61000-4-29 for voltage dips and interruptions on DC supplies.

The NetWave series is well suited for testing inverters (e.g. solar power, wind power), electric vehicle charging applications and HV component tests like ISO 21498, LV 123 etc.

Additionally, the NetWave offers the necessary capabilities for avionics testing as per DO-160, Airbus ABD0100 and Boeing as well as per MIL-STD-704 and is perfectly suited as reference source for Harmonics and Flicker testing.

Optionally the NetWave 3-phase series can be equipped with a power-recovery module to absorb fed-back power (AC/DC) up to nominal power of the NetWave.

### NETWAVE - THE POWERFUL MULTITALENT FOR AC AND DC SUPPLY SIMULATION

The programmable 3-phase AC/DC power sources with their wide frequency bandwidth offer powerful waveform generation capabilities for various test applications in the

EMC area and for avionics testing. Based on a Dual-Processor technology, with an integrated high-performance PC, a digital signal processor (DSP) and equipped with a hard disk, the NetWave Series is capable to generate and record waveforms in realtime.

According to standard requirements a pure sinusoidal voltage is needed for harmonics and flicker measurements. The output voltage of the NetWave Series is therefore guaranteed to have a very low distortion (THD) of less than 0.5% regardless of the load.

No matter whether waveforms are programmed of segments or of single points (normally resulting in MBs of data) the NetWave masters it all.

Interfaces like GPIB and Ethernet are common features with the NetWave Series.

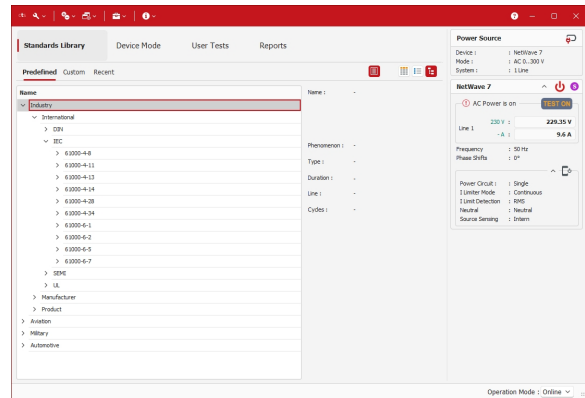
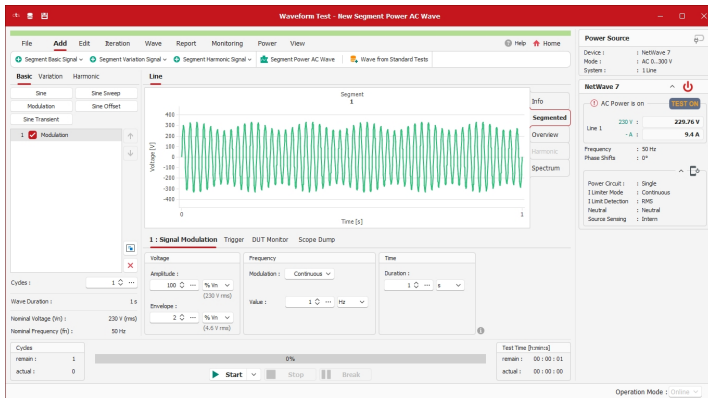
### THE COMPLETE SOLUTION FOR HV COMPONENTS TESTING

With the NetWave it is to test HV components up to 1120 VDC according to ISO 21498, LV 123, VW 80300 and other automotive standards. Tests included are fast and slow voltage variations as well as voltage ripple tests. The additional LF amplifier AMP 200Nx uses the CN 200Nx to couple voltage ripples up to 450 kHz to the supply lines.

With the closed loop method, the net.control software measures the voltage ripple and continuously controls the amplitude.

**EDITING, DOCUMENTING AND MANAGING YOUR WAVEFORMS AND STANDARD TESTS**

Compliance Test Studio is the all-in-one software platform to easily and conveniently control the NetWave Series. By means of the software the user can program any kind of waveforms either composed from segments or points and download them into the NetWave. Enhanced graphic tools are at hand to adjust the waveform according to individual requirements. Compliance Test Studio provides a library of an extensive compilation of predefined segments as well as tens of thousands of standard test routines as per EMC and avionics standards. Compliance Test Studio is also handling any waveform recorded by other method (e.g. captured by an oscilloscope) or imported as Excel or CSV files. All waveforms can be downloaded into the NetWave. Compliance Test Studio offers an enhanced reporting tool to generate test and measuring reports and can be used under Windows (10 / 11).



**Available Options & Accessories**

Opt-3 NWB	built-in measurement board with power analyzer functionality (3 x voltage and 3 x current), recommended for Aerospace applications (i.e. DO-160, MIL STD 461 etc.)
Opt-3 DC-EVR	Enhanced voltage range für DC, doubles the DC output voltage (max. 1120 VDC) (included in xx.5 models)
Opt-3 Parallel 90/108	Parallels all three phases to one. The common 1-phase output is on a separate terminal block for EUT connection. (included in xx.5 models)
Opt -3 Recovery 90/108	adds a recovery module to the NetWave which allows full sink capabilities with power recover to the grid (included in xx.5 models)
Opt-3 MS 90/108	Multi-source option to connect three NetWaves for a high power three-phase system (requires parallel option in each NetWave)
Opt-3 CS 90/108	Cascade source option to connection two NetWaves in series for high voltage system (requires parallel option in each NetWave)
F-Box	Lowpass filter for smoothing the DC voltage for very low ripple applications, i.e. MIL-HDBK-704 HDC 103 & LDC 103, several models available
L-Box	50 µH decoupling coils with integrated 10 µF capacitor for MIL-STD-704 LDC, several models available
DPA 503N	Digital power analyzer for harmonics and flicker measurements according IEC 61000-3-2, -12, -3-3, -11 and other standards
AIF 503N	Artificial flicker impedance for flicker measurements according IEC 61000-3-3 and -11, with Zref and Zetest, several models available from 16 to 75A
AMP 200N2	LF Signalgenerator & Amplifier, DC to 250 kHz, (500 kHz), max. 1000 W, output voltage max. 160 Vp-p, 50 Vrms
CTS.xxx	Compliance Test Studio software, various licenses available for industry, aviation, military and automotive compliance testing

**Technical Specifications**

	NetWave 90.2	NetWave 90.5
Output Power AC	90 kVA	
Output Voltage AC	360 V (L-N), 620 V (L-L)	400 V (L-N), 690 V (L-L)
Output Current AC	max. 100 A cont. per line (at 300 V), 150 A for 3 s, 500 A repetitive peak, max. 300 A (Opt-3 Parallel)	
Output Power DC	110 kW	
Output Voltage DC	max. $\pm 500$ V, $\pm 1000$ VDC (Opt-3 DC-EVR)	max. $\pm 560$ V, $\pm 1120$ VDC (Opt-3 DC-EVR)
Output Current DC	max. 100 A cont. (at 360 V), 150 A for 3 s, 500 A repetitive peak, max. 300 A (Opt-3 Parallel)	
Number of Lines	3	
Bandwidth	5 kHz	
Ripple	<50 V: 110 mV; >50 V: <110 mVrms + 0.02% of set value,	<50 V: 110 mV; >50 V: <200 mVrms + 0.02% of set value,
THD @ 50/60Hz, max.	0.5 %	
Voltage Accuracy	DC: $\pm 0.2$ % of set value $\pm 0.15$ % of full scale, AC: add $\pm 0.1$ % of set frequency /1000	
Phase Resolution	1 °	
Frequency Accuracy	100 ppm	
Slew Rate max.	8000 V/ms	

**General Specifications**

	NetWave 90.2	NetWave 90.5
Compensation / Sense	internal / external sense, max. compensation 15%	
Display and Controls	2-Line LCD display, LED indicators, operating keys	
Safety	Emergency stop, external relay control	Emergency stop, external relay control, interlock
Protection	Over current, over voltage, over temperature, low voltage, current limiter	
Com. Interface	GPIB, Ethernet, USB (Type A), Frame Bus	
Trigger Modes	Input: 2x trigger, 2x DUT monitor; Output: 2x Trigger	
Output Connectors	Screw terminal, 6 mm lab plugs	
AC Supply	-400: 3 x 400 V, 210 A cont. / 318 A for 3 s, per phase -480: 3 x 480 V, 175 A cont. / 265 A for 3 s, per phase 3PH + PE (no neutral) 45 - 65 Hz	
Supply Connector	Screw Terminal	
Dimensions	2080 x 1810 x 970 mm 1785 x 1210 x 755 with recovery option	1785 x 1210 x 755
Net Weight	1700 kg 2000 kg with recovery option	2000 kg
Operating Environment	5°C - 35°C, 10% - 90% non-condensing, 86 kPa (860 mbar) to 106 kPa (1 060 mbar)	