For R&D, Production Lines,
Built-in ATE System .....

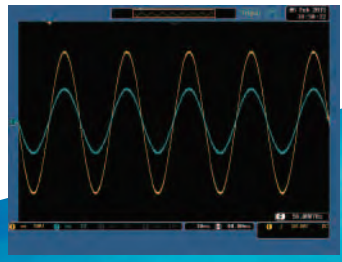
PROGRAMMABLE AC/DC POWER SOURCE

EC750SA/EC1000SA

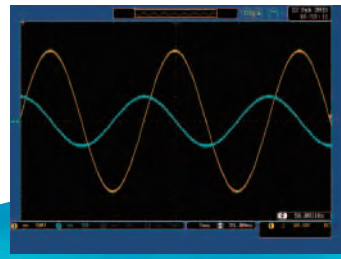
Hybrid Power Control sets us apart

Stable Output
in Various Load Conditions

Resistance Load
10kΩ, 10mA



Capacitance Load



Full Power,
AC as well as DC

1kVA/1kW

750VA/750W

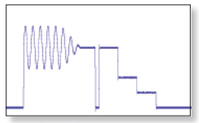
- Max. Output Voltage: 310 V
- Peak Current Output of up to 4 times as large as the Max. current (RMS value) at the rated output voltage
- Measurement, Sequence, Current Limiter and Protection Function ...
- Control Software

NF Corporation

Basic Performance and Functions

A Variety of Output

With AC, full-power output is also available for DC. In the AC+DC mode, an AC wave (sine wave, square wave, or arbitrary waveform) can be superimposed on the DC output.



▲AC+DC

		100 V range	200 V range	Resolution
AC	Output voltage	0 V to 155 V	0 V to 310 V	0.1 V
	Maximum current	10 A	5 A	–
	Frequency	1 Hz to 550 Hz		0.1 Hz
DC	Output voltage	-220 V to +220 V	-440 V to +440 V	0.1 V
	Maximum current	10 A	5 A	–

Eight output modes, combining two operation modes and four signal source modes can be set. The most appropriate mode for an application can be selected.

Operation modes	Alternating current (AC), direct current (AC + DC)
Signal source modes	Internal (INT), external (EXT), internal/external (ADD), external synchronization (SYNC)

Maximum Peak Current

A peak current up to four times as large as the maximum current (RMS values) can be output at the rated output voltage. The EC series also supports capacitor input load (up to crest factor 4).

Limiter Function

Output current limits can be set with positive/negative values, and RMS values. In the evaluation of a prototype, this function is useful for protection when an abnormal current is caused by abnormal operation of the load.

Protection Function

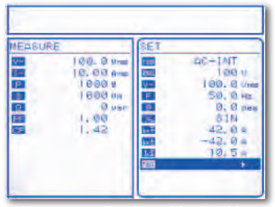
The EC series has a built-in function for protecting the power source itself if a problem occurs due to issues such as output overvoltage or overcurrent, power unit trouble, internal control problems. If a problem occurs, it is displayed on the panel and output is turned off.

Maximum Peak Current

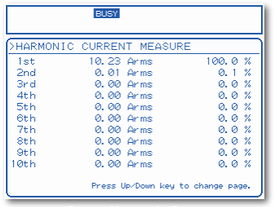
The EC series is equipped with high accuracy measurement functions for measuring synchronization frequencies, load power factors, and even the harmonic currents, in addition to the voltage, current and output power. Setting values and measurement values are simultaneously displayed on large-screen display.

Measurement Items

- Output voltage (effective value, DC average value, and peak values)
- Output current (effective value, DC average value, peak value, and peak value hold)
- Output power (effective, apparent, and reactive power)
- Frequency (at external synchronization)
- Load power factor
- Load crest factor (CF)
- Output harmonic current (fundamental wave : 50 Hz/60 Hz, up to the 40th order)



▲Measurement Results and Setting Values

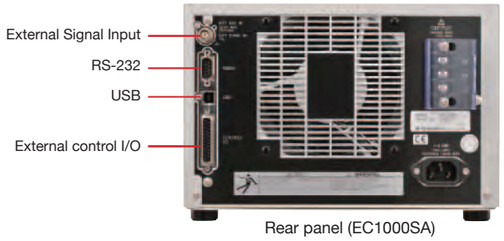


▲Output Harmonic Current

Interface and External Control I/O

Interfaces and an external control I/O provide support for system integration and automation.

- Interface RS-232, USB
- External control I/O
  Control input : Output on/off, sequence control, memory recall
  Status output : Power on/off, output on/off, protection operation, limiter operation, output range, sequence, etc.



Rear panel (EC1000SA)

Others

- External Signal Input
  EXT: Amplifies external signal, used as a power amplifier
  SYNC: Synchronization of signal source frequency with external signals
  ADD: Addition of external signals to internal signals
- Output on Phase Setting
  The phase can be set from 0° to 359.9° at output on.
- Setting Range Limit Function
  Limits the setting range for the output voltage and frequency
- Setting Memory 30 setting statuses

Stable Output, Multifunction, and Compact size

PROGRAMMABLE AC/DC POWER SOURCE

EC750SA/EC1000SA

The EC750SA and EC1000SA provide not only a stable power supply, but also the necessary functions for power supply testing, such as measurement, current limiter, , and sequence functions. They covers various applications as a power source for testing a wide range of fields, such as electronic components, automobiles, and home appliances, and as a stabilized power source in laboratories as well.

Hybrid Power Control

Technology of achieving stable outputs

The hybrid power control integrates the negative feedback control (analog control technology), which is NF's core technology, and intelligent digital control technology.
Analog technology is provided when wide-band, high response is required, and digital technology is provided for flexible control according to load condition.
The hybrid power control achieves highly stable and robust output by taking full advantage of both analog and digital characteristics.

User Interfaces Designed for Ease-of-use

Small and Light

The EC series features a compact design for convenient desktop use. It weighs approx. 9.7 kg and can be easily carried anywhere.

Large-screen Display

Setting and measured values are displayed on a large, easy-to-read screen (5.7-inch with a backlight).

Universal Outlet

A universal AC outlet (service outlet) is equipped on the front panel . Various types of power plugs around the world can be connected.

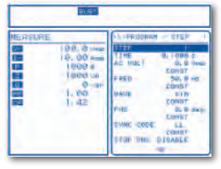
Worldwide Power Supply Input

Power input ranging from AC90 V to 250 V provides worldwide compatibility.

Abundant Functions for Improving the Efficiency of Power Supply Testing

Sequence

Programming of various test patterns such as test repetition, combinations of complex test condition, and long-term testing enable automated test sequences. Power source tests for each export destination can be performed efficiently.

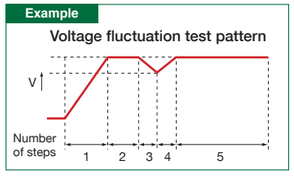


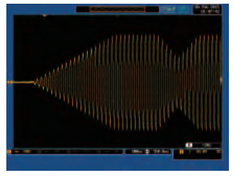
Overview of Sequence Function

- Number of steps: up to 255 (in one sequence) 0.1 ms/step (min.)
- Parameters: DC voltage, AC voltage, frequency, waveform, 2-bit step synchronization output

Example

Voltage fluctuation test pattern

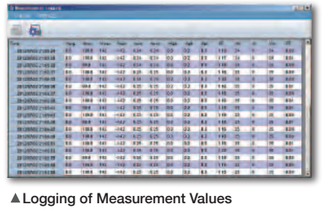




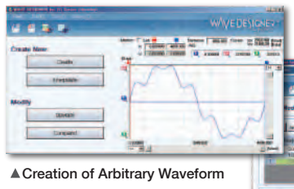
Control Software

The control software enables basic parameter settings, data logging, arbitrary wave editing/transfer, and sequence editing/control. It supports automation of measurement data analysis in product development and of various tests in production lines.

▲Remote Control



▲Logging of Measurement Values

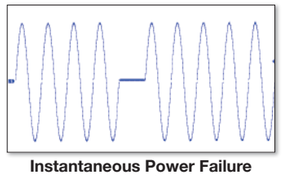


▲Creation of Arbitrary Waveform

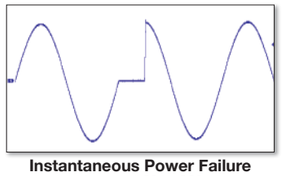
▲Sequence Editing

Output Waveform

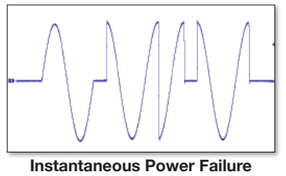
Supports various power tests using sequence and arbitrary waveform.



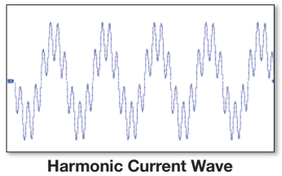
Instantaneous Power Failure
1-cycle
(Sequence)



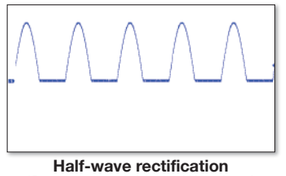
Instantaneous Power Failure
Phase of 0° to 90°
(Sequence)



Instantaneous Power Failure
Including phase continuity and discontinuity
(Sequence)



Harmonic Current Wave
Superimposing 3rd-order, 5th-order and 7th-order harmonic current on the fundamental wave
(Arbitrary Waveform)



Half-wave rectification
(Sequence or Arbitrary Waveform)

Examples of Applications

- Max. Output voltage: 310 V
  LED Driver Input Voltage Test
  Support for LED driver input voltage of AC90 V to 305 V (Worldwide specifications)
- AC+DC Mode
  Evaluation of DC-DC Converter
  For Noise superimposition test, and ripple current test
- DC Offset Adjustment
  Driving Transformers and Inductive Loads
  Prevention of magnetic saturation by adjusting DC offset voltage to zero

The following conditions are provided unless otherwise noted.
- Signal source: INT (internal signal source)
- Output waveform: sine wave
- Load: resistance load for power factor 1
- Output terminal: Rear panel output terminal block

- [set] indicates a setting value.
- A value without the accuracy is the nominal value or representative value (shown as typ.)
- When two values are indicated with a slash, this means that specifications vary depending on the output range. The value before the slash is for 100 V specifications, and the value after the slash is for 200 V specifications.

AC/DC Mode, Signal Source

AC/DC Mode	AC, AC+DC
Signal Source	INT(Internal), EXT(External), ADD(Internal and external), SYNC(External synchronization)

Power Output

AC Output	
Output Power	**EC750SA:** 750 VA **EC1000SA:** 1000 VA (When the input is from AC180 V to 250 V, hereinafter referred to as "AC 200V input system") When the input is from AC 100 V to 180V (hereinafter referred to as "AC 100 V input system"), output power is limited to 750 VA.
Rated Output Voltage	100 Vrms/200 Vrms
Output Range	100 V range/200 V range
Voltage Setting Range *1 *2	0.0 to 155.0 Vrms/0.0 to 310.0 Vrms (Resolution 0.1 Vrms)
Voltage Accuracy *3	± (0.5% of set + 0.6 Vrms/1.2 Vrms)
Max. Current *4 *5 *6 *7	10 Arms/5 Arms
Max. Peak Current *4 *8 *9 *10	**EC750SA:** 30 Apk/15 Apk **EC1000SA:** 40 Apk/20 Apk
Frequency Setting Range *11	1.0 Hz to 550.0 Hz (Resolution 0.1 Hz)
Frequency Accuracy	±0.01% of set (1.0 Hz to 550.0 Hz,23˚C±5˚C)
Output Waveform *11	Sine wave, square wave,arbitrary wave (16 types)
Output On Phase *11	0.0 deg. to 359.9 deg. variable (resolution 0.1 deg.)
DC Offset	±50 mV/±100 mV (typ., fine adjustment available, AC mode)
Small Amplitude Frequency Response *12	AC mode: 1% (40 Hz to 550 Hz) AC+DC mode: 1% (40 Hz to 550 Hz)
DC Output	
Output Power	**EC750SA:** 750 W **EC1000SA:** 1000 W (AC 200 V input system) (For the AC 100 V input, output power is limited to 750 W)
Rated Output Voltage	100 V/200 V
Voltage Setting Range *1 *2	-220.0 V to +220.0 V/-440.0 V to +440.0 V (Resolution 0.1 V)
Voltage Accuracy *13	± (|0.5% of set|+0.6 V/1.2 V)
Max. Current *4 *5	10 A/5 A
Max. Peak Current *4 *8	**EC750SA:** 30 Apk/15 Apk **EC1000SA:** 40 Apk/20 Apk
Output Voltage Stability	
Fluctuation with output current	45 Hz to 65 Hz: Within ±0.15%, DC and 40 Hz to 550 Hz: Within ±0.5% **EC750SA:** In the case that the output current is changed and the output power is changed from 0% to 100% of the maximum output power, at the output terminal) **EC1000SA:** In the case that the output current is changed from 0% to 100% of the maximum current, at the output terminal, rated output voltage)
Fluctuation with input voltage	Within 0.2% (power input voltage: 100 V/120 V/230 V, no load, rated output)
Output Voltage Distortion Factor	0.5% or lower (50 Hz/60 Hz, 50% or higher of rated output voltage)
Output terminal *14	Terminal with M4 screws (rear panel), AC outlet (universal type, front panel)

*1 Signal source: INT, SYNC or ADD, no load *2 The AC settings (peak value) + DC setting that can be set are within the voltage setting limit range *3 AC Mode, 50 Hz/60 Hz, 23˚C±5˚C, Sine wave, no load, 10 V to 155 V/20 V to 310 V *4 The limit on max. output power may cause a reduction in max. output current and max. peak current (EC1000SA for power input AC100 V) *5 For At or above the rated output voltage, the limit on max. output power reduces max. output current. (EC1000SA only). *6 In the case of 40 Hz or lower, or 400 Hz or lower, max. output current may decrease. *7 The RMS current of AC + DC is max. output current *8 For At or above the rated output voltage, the limit on max. output power reduces max. output peak current. *9 For a capacitor input type rectifier circuit (crest factor = 4) *10 In the case of 45 Hz or lower, or 65 Hz or higher, max. output peak current may decrease. *11 Signal source: INT, SYNC or ADD, no load *12 Signal source: INT and SYNC, 100 V range, output voltage: 20 Vrms, 50 Hz rating *13 Signal source: AC+DC, AC0 V setting, 23˚C±5˚C, no load, -220 V to -10 V, +10 V to +220 V/-440 V to -20 V, +20 V to +440 V *14 Use AC outlet for AC (AC0 V to 250 V). When DC is included, use screw terminal on the rear panel.

Power Input

Voltage	100 V to 230 V±10% (Max. voltage 250 V), Overvoltage Category II
Frequency	50 Hz/60 Hz ±2 Hz (single phase)
Power Factor (typ.) *15	0.95 or higher (at AC100 V input), 0.90 or higher (at AC200 V input)
Max. Power Consumption	**EC750SA:** 1.2 kVA or lower **EC1000SA:** 1.4 kVA or lower

*15 The rated output voltage, the resistance load at the maximum current

Measurement Function

Voltage	
RMS Value (AC+DC: rms)	Full scale: 250.0 V/500.0 V, Resolution: 0.1 V
Average (AC+DC: avg)	Full scale: ±250.0 V/±500.0 V, Resolution: 0.1 V
Peak Value (Max/Min Individual: pk)	Full scale: ±250 V/±500 V, Resolution: 1 V
Current	
RMS Value (AC+DC: rms)	Full scale: 15.00 A, Resolution: 0.01 A
Average (AC+DC: avg)	Full scale: ±15.00 A, Resolution: 0.01 A
Peak Value (Max/Min Individual: pk)	Full scale: ±45.0 A, Resolution: 0.1 A Hold the maximum values of | max | and | min |
Power	
Effective (W)	Full scale: 1200 W, Resolution: 1 W
Apparent (VA)	Full scale: 1400 VA, Resolution: 1 VA
Reactive (var)	Full scale: 1400 var, Resolution: 1 var
Load Power Factor	Measurement range: 0.00 to 1.00, resolution: 0.01
Load Crest Factor *16	Measurement range: 1.00 to 50.00, resolution: 0.01
External Synchronization Frequency (SYNC mode only)	Measurement range: 38.0 to 525.0 Hz, resolution: 0.1 Hz
Output Harmonic Current *17	Measurement range: Up to 40th order, Full scale:15 Arms and 500%

*16 Calculated as output voltage RMS value × output current RMS value *17 This measurement doesn't comply with the IEC standards.

Current Limiter

Peak	
Positive current	**EC750SA:** +10.0 A to +31.5 A/+5.0 A to +15.8 A (Resolution: 0.1 A) **EC1000SA:** +10.0 A to +42.0 A/+5.0 A to +21.0 A (Resolution: 0.1 A)
Negative current	**EC750SA:** -31.5 A to -10.0 A/-15.8 A to -5.0 A (Resolution: 0.1 A) **EC1000SA:** -42.0 A to -10.0 A/-21.0 A to -5.0 A (Resolution: 0.1 A)
Limiter operation	When limiter is operating, output voltage is clipped.
RMS	
Setting range	1.0 A to 10.5 A (initial value: 10.5 A)/1.0 A to 5.3 A (initial value: 5.3 A), (Resolution 0.1 A)
Limiter operation	When limiter is operating, suppresses output voltage.

Sequence Function

Sequence function works with AC-INT, AC+DC-INT.

Number of Memories	One sequence per AC/AC+DC mode at both 100 V and 200 V range.
Number of Steps	255 max. (for each sequence)
Setting Range of Step Time	0.1 ms to 999.9999 s (Resolution: 0.1 ms)
Operation within Step	Constant, keep, linear sweep
Parameters	DC voltage, AC phase voltage, frequency, waveform, synchronous step output (2 bit)
Jump count	1 to 999 or infinite
Sequence Control	Start, stop, hold, branch

Control Software

Functions	
Remote Control	Parameter setting, store/recall, status monitoring
Logging	Reads and saves measured values.
Arbitrary Waveform	Waveform creation and edit, transfer, display and file operations
Sequence	Sequence data creation, edit, save, transfer, execution control
Operating Requirements	
CPU	300 MHz min. (CPU clock needed for the correspondence OS or faster)
Memory	128 MB min.
Free Hard Disk Space	64 MB min.
OS	Microsoft Windows XP/7 (32 bit), Microsoft Windows 7 (64 bit)
Disk Drive	CD-ROM drive
Interface	USB 1.1 or higher

Other Functions

Setting range limit function *11		
Voltage	Positive voltage setting range	+0.1 V to +220.0 V/ +0.1 V to +440.0 V (Resolution: 0.1 V)
	Negative voltage setting range	-0.1 V to -220.0 V/ -0.1 V to -440.0 V (Resolution: 0.1 V)
Frequency (Lower limit≤Upper limit)	Upper limit setting range	1.0 Hz to 550.0 Hz (Resolution: 0.1 Hz)
	Lower limit setting range	1.0 Hz to 550.0 Hz (Resolution: 0.1 Hz)
Arbitrary Wave		
Number of memories	16 (nonvolatile)	
Waveform length	4096 words	
External Signal Input		
External Signal Input (EXT/ADD mode)	Gain setting range: 0.0 to 220.0 times/0.0 to 440.0 times (Resolution: 0.1) Frequency range: DC to 550 Hz (sine wave)	
External Sync Input (Sync mode)	Sync signal source: external sync signal (EXT) or power input (LINE) Sync frequency range: 40 Hz to 500 Hz	
Memory Function	Store and recall settings, Basic settings: 30	
Protections	Protective operation for abnormal output , power unit error, internal control error, and abnormal internal temperature	
External Control I/O	Enables control of the system using external signals . Control input, state output	
Interface	USB (USBTMC), RS-232	
LCD Display	White or blue base color.	
Others	Beep, keylock, output setting at power-on, reset function, self test function	

Generals

Withstanding Voltage and Insulation Resistance	AC1500 V, Insulation Resistance : 30 MΩ or higher (DC 500 V)
Operating Temperature/Humidity	0˚C to +40˚C/5% to 85%RH (absolute humidity 1 to 25 g/m³, no condensation)
Dimensions (mm)	258(W)×176(H)×440(D) (not including protrusions)
Weight	Approx. 9.7 kg
Safety	EN61010-1:2010
EMC	EN61326-1:2006 (Group 1, Class A) EN61000-3-2:2006 + A1:2009 + A2:2009 EN61000-3-3:2008
RoHS	Directive 2011/65/EU
Accessories	Operation manual, control software, power cord set 1 (15 A/125 V), power cord set 2 (10 A/250 V, without plug, EC1000SA only)

The contents of this catalog are current as of July 15, 2015.
- External view and specifications are subject to change without prior notice.
- Please check the latest specifications, prices, and lead time for purchase.
- The company names and product names described here are trademarks or registered trademarks of respective owners.

NF Corporation

Head Office
6-3-20 Tsunashima Higashi, Kohoku-ku, Yokohama 223-8508, Japan
http://www.nfcorp.co.jp/english/

NF Techno Commerce Co., Ltd. International Sales Division
Meiko Building, 3-1-13 Nishi-Ikebukuro, Toshima-ku, Tokyo 171-0021, Japan
Phone : +81-3-5957-1809 Fax : +81-3-5957-1813

PU15U-PS82E-1A0.3