

### Main Specifications

#### Output

**Output Voltage Range :** Any 120 Vp-p between - 115 V and + 115 V

#### Maximum Output Voltage (CV Mode)\* :

DC to 0.5 kHz : ± 60 V (Load resistance of 6 Ω)  
 0.5 kHz to 70 kHz : ± 60 V (Load resistance of 4 Ω)  
 70 kHz to 150 kHz : ± 50 V (Load resistance of 6 Ω)

#### Maximum Output Current (CC Mode)\* :

DC to 0.5 kHz : ± 10 A (Load resistance of 6 Ω)  
 0.5 kHz to 30 kHz : ± 15 A (Load resistance of 4 Ω)  
 30 kHz to 70 kHz : ± 8.3 A (Load resistance of 6 Ω)

#### Low Amplitude Frequency Response\* :

CV Mode : DC to 200 kHz (Output amplitude of 12 Vp-p)  
 CC Mode : DC to 70 kHz (Output amplitude of 12 Vp-p)

#### Response Calibration Function :

Response characteristic of the amplifier can be adjusted with adjusting knobs on the front panel (time constant : T, voltage : V, current : I)

#### Rise/Fall Time\* :

CV Mode : 2.5 μs (Square wave ±60 V)  
 CC Mode : 4 μs (Square wave ±10 A)

#### Output Impedance\* :

CV mode : 7 mΩ + 1.3 μH  
 CC mode : 10 kΩ / 0.45 μF

#### Output Voltage Limiter :

+ voltage setting range : + 7 V to + 117 V (Resolution of 1 V)  
 - voltage setting range : - 7 V to - 117 V (Resolution of 1 V)  
 (The difference between the + voltage and - voltage is 24 V or higher, or 124 V or lower)

#### Output Current Limiter :

+ current setting range : + 1 A to + 26 A (Resolution of 0.1 A)  
 - current setting range : - 26 A to - 1 A (Resolution of 0.1 A)

#### Residual Noise :

(The input terminal is shorted. 10Hz to 300kHz)  
 CC Mode : 8 mArms or lower  
 CV Mode : 50 mVrms or lower

#### Signal Source

Select from internal signal source, external signal input, internal signal source + external signal input

#### Internal Signal Source :

DC  
 Amplitude setting range : CC mode : ± 115 V (Resolution of 0.01 V)  
 CV mode : ± 10 A (Resolution of 0.001 A)

#### Superposed AC

Waveform : Sine wave, square wave, arbitrary wave (16 types)  
 Frequency setting range : 1 Hz to 100 kHz (Resolution of 0.1 Hz)  
 Amplitude setting range : CV mode : 0 to 120 Vp-p (Resolution: 0.1 Vp-p)  
 CC mode : 0 to 30 Ap-p (Resolution: 0.01 Ap-p)

#### External Signal Input :

Frequency range : DC to 200 kHz  
 Gain : 100 times (100V / 1V), 10 times (10A / 1V)

#### Sequence Function

**Number of Sequences :** 1 sequence each for CV and CC mode

**Number of Steps :** 1 to 255 (in one sequence)

**Step Time :** 0.1 ms to 999.9999s (Resolution of 0.1 ms)

**In-Step Operation :** Constant or linear sweep

#### Parameters :

CV Mode : DC voltage, superposed AC voltage, frequency, waveform, synchronous 2-bit step output

CC Mode : DC current, superposed AC current, frequency, waveform, synchronous 2-bit step output

**Number of Sequence Repetition :** 1 to 999 or continuous

**Sequence Control :** Start, Stop, Hold and Branch (Jumps to a specified step by the external trigger input.)

#### Others

#### Monitor Output :

Output voltage monitor output, output current monitor output

#### Measurement Function :

DC/AC output voltage measurement, DC/AC output current measurement

#### Number of Arbitrary Waveform Memories :

16 (1024 words, 16 bits) Written via USB interface

#### Store/Recall Memory :

30 patterns of set values/set status can be stored/recalled

#### Protection Function :

Protection function activated against excessive output voltage, excessive output current, excessive internal power loss, power supply error, internal overheating, and operation panel error

**Interface :** USB interface equipped in standard specification

#### Other Functions :

Output ON/OFF function, external control input/output, key lock

**Power Requirements :** 90 V to 250 V, 47 Hz to 63 Hz

#### Power Consumption/Power Factor :

Maximum of 1200 VA, Power factor 0.95 (at AC 100 V)

#### Ambient Temperature/Humidity Range :

Performance Guarantee : + 5 to + 35°C, 5 to 85 % RH  
 (with absolute humidity of 1 to 25 g/m<sup>3</sup> and no condensation)

Storing Conditions : -10 to + 50°C, 5 to 95 % RH  
 (with absolute humidity of 1 to 29 g/m<sup>3</sup> and no condensation)

**External Dimension (mm) :** 430 (W) x 177 (H) x 550 (D) (Excluding protrusions)

**Weight :** Approximately 26 kg

\* Typical values given. These vary depending on the adjustment with the response calibration function.

### Related Products

2-Type (30 A peak/60 A peak) Lineup for Testing Vehicle Electrical and Electronic Components

#### High Speed Bipolar Amplifier System for Testing Vehicle Electronic Components, As-161 Series

- Tests 12 V/24 V/42 V vehicle electronic components
- High speed and broadband: DC to 150 kHz
- High output voltage : - 15 V to + 60 V
- High current : 30 A peak/60 A peak (We have fabricated this system with peak current at 100 A to 200 A before)
- Testing software available



As-161-30 (30Apeak)

High Speed and Broadband from DC to Max. 10 MHz, High Output Voltage of ± 150 V at Maximum

#### High Speed Bipolar Amplifier, HSA Series

- High speed and broadband (DC to max. 10 MHz)
- High voltage output (Max. ± 150 V)
- Low output impedance
- Good step response
- Equipped with DC bias, monitor output, and range shifting function
- 6-model lineup



• The description given in this catalogue is based on the information as of February 10, 2005.  
 • Please verify the latest specifications with us or one of our agencies before ordering.  
 • Some appearance and specifications may change without notice.  
 • The company names and product names given in the catalogue are the trademarks or registered trademarks of the companies.

## NF Corporation

6-3-20 Tsunashima Higashi, Kohoku-ku, Yokohama, Japan  
 Phone : +81-45-545-8128 Fax : +81-45-545-8187  
<http://www.nfcorp.co.jp/english/index.html>

● REPRESENTATIVE

With Built-In Sequential Signal Source

# Bipolar DC Power Supply BP4610

## Sequence Function for Fully Programmable Output Pattern Bipolar Output Good for Inductor and Capacitance Load

As a power supply for testing vehicle electrical and electronic components/motor/solenoid/large capacitors and as electronic load for testing power supplies/batteries...

Can be used for various applications.

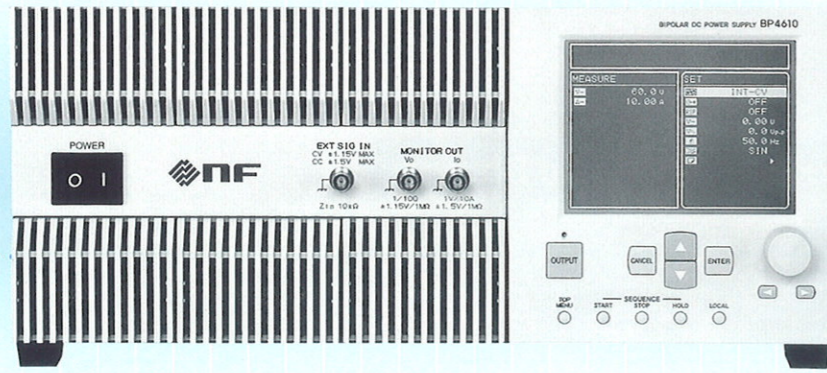


### Features

- Built-in 255-step sequential signal source
- Voltage/Current output for four quadrants
- High power : ± 60 V (Can be shifted), ± 10 A (30 Ap-p)
- High speed : DC to 150 kHz
- Constant voltage (CV) / Constant current (CC) operation selectable
- Response calibration function
- Voltage/Current limiter, measurement display function
- USB interface and external analogue input

## NF Corporation





# Full Output Pattern and Wide-Range Output Area

Universal power supply based on new concept to bring high repeatability and work efficiency in testing batteries and devices with reactance component such as motor/solenoid/capacitor

## Enriched Basic Performance

Fully equipped specification providing high voltage, high current, high speed, and constant current operation.

High voltage required in testing 12V/24V/42V vehicle electrical and electronic components, high current necessary for large parts, high speed required in driving actuators, and furthermore, constant current operation effective in driving solenoids with low impedance. With enriched specification satisfying all such requirements, BP4610 responds to the needs in development of devices and device testing.

### Output Performance

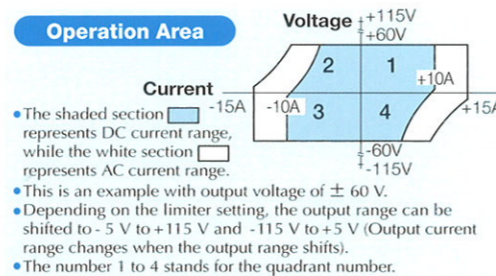
- High output voltage : 120 Vp-p  
Output range can be shifted to -5 V to +115 V and -115 V to +5 V, depending on limiter setting
  - High current :  $\pm 10$  A (DC), 30 Ap-p
  - High speed : DC to 150 kHz
  - Constant voltage (CV) / Constant current (CC) operation selectable
- \* See Main Specifications for details

## Wide-Ranging Output Area

Bipolar power source capable of handling positive/negative voltage and sink/source current

BP4610 can output in four quadrants and is capable of handling two directions of current, which are source (supply) and sink (absorption) current, let alone positive/ negative voltage. From devices that generate back electromotive force such as solenoids, capacitive load such as electrolytic capacitor, and even to piezoelectric material charged with electromotive force and power sources and batteries such as fuel cells, you can connect BP4610 to devices and systems that cannot be driven with normal DC power supply with a sense of security.

### Operation Area



## Universal Output Pattern

Built-in sequential signal source that allows you to use sweep and arbitrary waveform

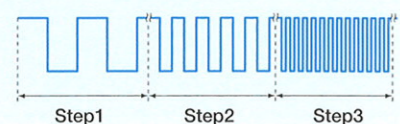
BP4610 has a built-in sequential signal source. For example, by programming a series of voltage change pattern used in voltage fluctuation test on electrical and electronic components, the test can be done in a single operation since the output changes in order according to the procedure.

When setting a sequence, you can use DC (direct current), sine wave, and square wave provided in the system and arbitrary waveform (16 types) loaded via USB interface. Maximum of 255 steps (minimum 0.1 ms per step) can be set and waveform, level, duration, and continuous/sweep can be selected for each step. Furthermore, you can specify repetition of sequence for 1 to 999 times (or continuous).

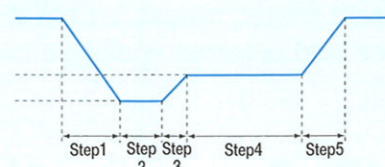
In addition, the power supply provides branch operation in which the external trigger input moves the sequence to a specified step, the function to stop the sequence, and the function to hold the operation.

### Various Output Patterns Using Sequence Functions

**Ex.1** Relay Operation Test  
(Withstand Power Supply Fluctuation Test)



**Ex.2** Vehicle Electrical and Electronic Components Test (ISO/DIS7637-2.2 Pulse 4)  
(Simulation of Transient Voltage Drops at Startup)



• Setting Screen for Ex.2 Set for each step

\* The optional sequence editing software is available. Contact us for details.

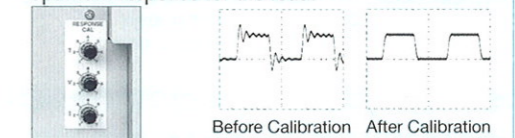
## Optimum Response for Each Load

Response calibration function

BP4610 has a new response calibration function that allows users to individually optimize transient response characteristic in square wave output or sudden output change. Transient response for load with complicated impedance characteristic such as electromagnetic components with inductance (coil component) or capacitance (capacitor component) differs among loads. BP4610 has a new and convenient response calibration function with which users can adjust response characteristic according to the load.

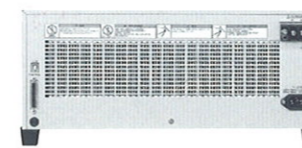
### Response Improvement Example

The response calibration function can maximize the ability of the system and allows users to obtain the optimum response for the load.



▲ Use the three knobs located on the back of the operation panel to make adjustment while watching the waveform on the oscilloscope.

## Attentive Additional Functions



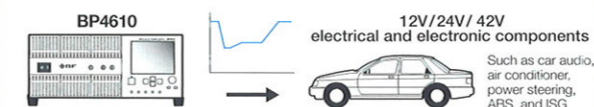
Back Panel

- Voltage/Current limiter effective in preventing load failure
- DC voltage/current measurement display for monitoring output state
- USB interface easily connectable with PC
- External analogue input that can be used even for oscillators and record signal
- Output ON/OFF function, monitor output, store/recall memory, external control input/output, and key lock
- Simultaneous operation with more than two units
- Worldwide-compatible power input of 90 V to 250 V

## ★APPLICATION

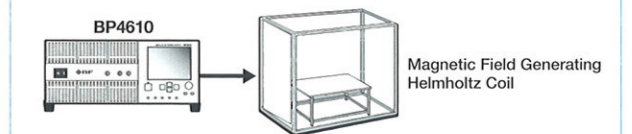
**1** For power supply voltage fluctuation test on 12V/24V/42V vehicle electrical and electronic components

With BP4610, you can perform power supply voltage fluctuation test on various vehicle electrical and electronic components. You can program a certain pattern in advance using the sequence function of the power supply. The power supply handles the test on 42V components let alone 12V/24V components.



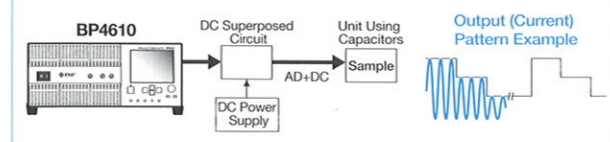
**2** As a constant current power supply for generating magnetic field

In electromagnetic field test, constant current needs to be supplied to the coil for stable generation of constant magnetic field. BP4610 can output constant current (CC) to keep the current running through the coil constant and generate stable magnetic field.



**3** As a constant current power supply for capacitor ripple test

Using this power supply, you can perform ripple test on the units using capacitor(s) such as inverters. The constant current (CC) of BP4610 allows you to perform test with stable operation. You can also program output patterns using the sequence function.



**4** As a constant current power supply for plating

The power supply can be used as a constant current power supply for plating various electronic materials. Using the constant current (CC) output of BP4610, you can always supply constant and stable current. You can also program output patterns using the sequence function.

