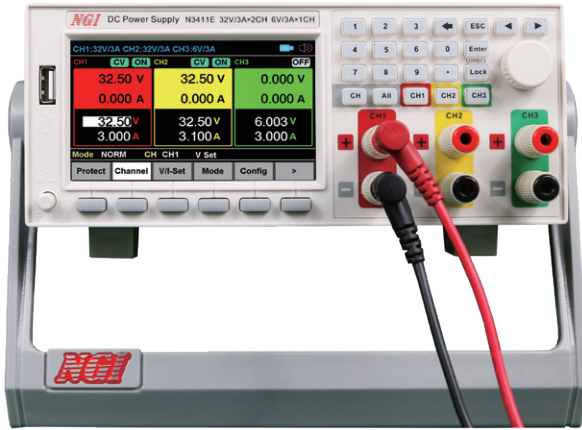


N3410 Series Triple-channel Programmable DC Power Supply



Product Introduction

N3410 시리즈는 고성능 및 높은 신뢰성을 갖춘 3채널 프로그래밍 가능 DC 전원 공급기입니다. N3410은 하프 19인치 2U 사이즈로 3개의 독립적인 출력 채널을 통합하고 전면 및 후면 배선을 모두 지원합니다. 컴팩트한 사이즈로 N3410은 운반 손잡이와 경사(tilt) 스탠드가 있는 벤치탑 애플리케이션을 모두 지원합니다. 시스템 통합을 위한 랙 설치를 지원합니다. 테스트 및 측정 정보는 4.3인치 LCD 스크린에 표시됩니다. 다양한 테스트 요구 사항을 충족하기 위해 선택적 기능으로 DVM 측정을 제공합니다.

Application Fields

- ▶ 학교 실험실
- ▶ 연구개발 연구소
- ▶ 생산라인 검사 및 유지 보수
- ▶ 유지보수 테스트

Main Features

- ▶ 전압 범위 : 6V/32V/60V, 전압 증가를 위한 직렬 연결 지원
- ▶ 전류 범위 : 3A/5A, 전류 증가를 위한 병렬 연결 지원
- ▶ 독립형의 3개 채널, 각 채널은 분리됨
- ▶ 낮은 리플&노이즈
- ▶ 0.1mV/0.1mA의 낮은 정확도 및 분해능¹
- ▶ 1ms 미만의 동적 응답 시간
- ▶ 직렬, 병렬 및 추적(trace) 출력 모드 지원
- ▶ 고정밀 DVM 측정(N3411P/N3412P/N3413P 전용)
- ▶ USB 포트를 통해 스크린샷을 지원하는 4.3인치 LCD 화면
- ▶ 시퀀스(SEQ) 테스트 기능²
- ▶ 실시간 출력 파형 디스플레이용 그래프³
- ▶ 경사(tilt) 스탠드가 있는 하프 19인치 2U 크기
- ▶ 전면 및 후면 출력단자
- ▶ LAN 포트 및 RS232 인터페이스

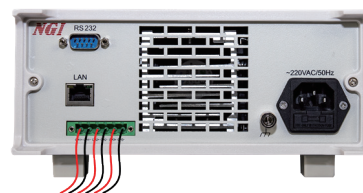
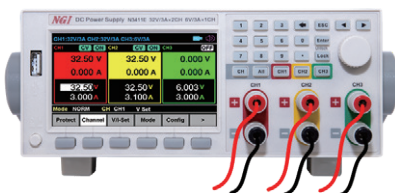
Remark 1: N3411E/N3412E/N3413E are with 10mV/1mA resolution.

Remark 2: SEQ is not available for N3411E/N3412E/N3413E.

Remark 3: Graph is not available for N3411E/N3412E/N3413E.

Front and rear wiring design

N3410 시리즈는 전면 및 후면 패널 배선을 모두 지원합니다. N3410을 벤치 상단에 놓거나 랙 위에 넣어서 통합해서 사용가능하여 사용자에게 편리함을 제공합니다.



High accuracy and low ripple

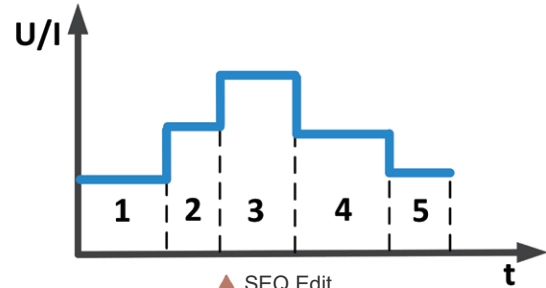
N3410은 출력 정확도에서 뛰어난 성능을 발휘합니다. 또한 매우 낮은 리플 및 노이즈가 있습니다. 리플 Vrms가 400 μ V 이하, Vp-p는 5mV 이하 보다 적습니다.



▲ Ripple Test

SEQ test function

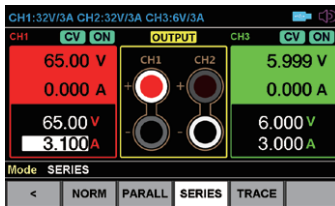
N3410 시리즈는 시퀀스 편집을 지원합니다. 또한 출력 전압, 출력 전류 및 단일 단계 실행 시간을 설정할 수 있습니다. 전압 및 전류 시퀀스의 100개 그룹이 사용자 정의가 가능합니다. 시퀀스 파일은 전면 패널의 USB 유형 A 인터페이스를 통해 가져올 수 있습니다.



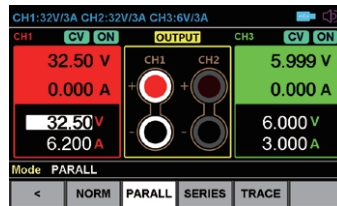
▲ SEQ Edit

Series, parallel and trace output modes

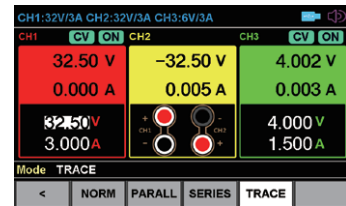
N3410 시리즈에는 CH1/CH2 시리즈, 병렬 및 트레이스의 세 가지 출력 모드가 있습니다. 또한 다양한 범위 및 전압 출력의 요구를 충족시키기 위해 외부 직렬 및 병렬 배선없이 전면 패널에서 스위칭할 수 있습니다.



▲ Series Mode



▲ Parallel Mode



▲ Trace Mode

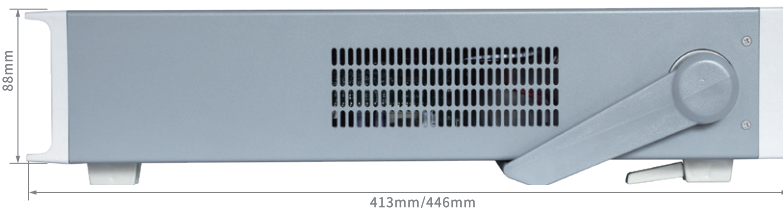
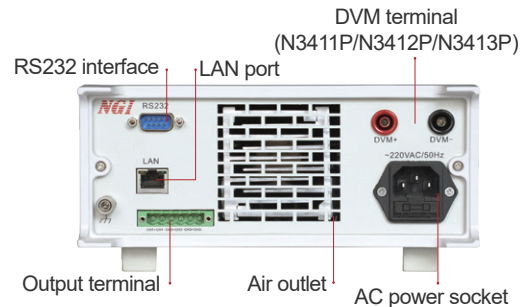
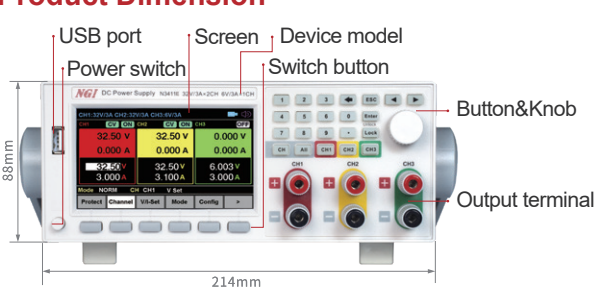
DVM measurement (for N3411P/N3412P/N3413P only)

N3411P/N3412P/N3413P에는 -600V~+600V 범위의 외부 전압을 테스트하기 위한 1채널 고정확도 DVM이 내장되어 있습니다. 측정 정확도는 0.01% F.S.와 5½ digit 측정 분해능을 가진 $\pm 600V / \pm 60V / \pm 6V$ 의 세 가지 자동 범위가 있습니다. 측정 데이터는 실시간으로 HD 화면에 나오며 전압 변화를 관찰하는 데 편리합니다.

Graph

그래프를 사용하여 출력 파형을 실시간으로 표시할 수 있습니다. 파형 표시 내용은 전압 시간, 전류 시간, 전력 시간 등과 같이 편집할 수 있습니다.

Product Dimension



Technical Data Sheet (1)

Model	N3411/N3411P		N3412/N3412P	
Channel	CH1/CH2	CH3	CH1/CH2	CH3
Voltage	32V	6V	32V	6V
Current	3A	3A	5A	3A
Series Mode-Voltage	64V	N/A	64V	N/A
Parallel Mode-Current	6A	N/A	10A	N/A
Total Power	210W		338W	
Setting Resolution-Voltage	0.1mV	1mV	0.1mV	1mV
Setting Resolution-Current	0.1mA	1mA	0.1mA	1mA
Setting Accuracy-Voltage (23±5°C)	<0.01% + 10mV	<0.03% + 10mV	<0.01% + 10mV	<0.03% + 10mV
Setting Accuracy-Current (23±5°C)	<0.05% + 5mA	<0.05% + 10mA	<0.05% + 10mA	<0.05% + 10mA
Setting Temperature Coefficient	30ppm/°C			
Readback Resolution-Voltage	0.1mV	1mV	0.1mV	1mV
Readback Resolution-Current	0.1mA	1mA	0.1mA	1mA
Readback Accuracy-Voltage (23±5°C)	<0.01% + 10mV	<0.03% + 10mV	<0.01% + 10mV	<0.03% + 10mV
Readback Accuracy-Current (23±5°C)	<0.05% + 5mA	<0.05% + 10mA	<0.05% + 10mA	<0.05% + 10mA
Readback Temperature Coefficient	30ppm/°C			
Long-term Stability	≤50ppm/1000h			
Voltage Ripple Noise (20Hz ~ 20MHz)	≤5mVp-p	≤10mVp-p	≤5mVp-p	≤10mVp-p
Voltage Ripple Noise (20Hz ~ 20MHz)	≤1mVrms			
Current Ripple Noise (20Hz ~ 20MHz)	≤3mArms			
Dynamic Characteristics				
Voltage Rise Time (no load) (10%-90%F.S. Variation Time)	20ms	20ms	20ms	20ms
Voltage Rise Time (full load) (10%-90%F.S. Variation Time)	50ms	21ms	50ms	21ms
Voltage Fall Time (no load) (90%-10%F.S. Variation Time)	400ms	200ms	400ms	200ms
Voltage Fall Time (full load) (90%-10%F.S. Variation Time)	45ms	13ms	45ms	13ms
Transient Recovery Time	≤1ms			
Line Regulation-Voltage	≤0.01%+1mV	≤0.01%+3mV	≤0.01%+1mV	≤0.01%+3mV
Line Regulation-Current	≤0.01%+1mA	≤0.02%+3mA	≤0.01%+3mA	≤0.02%+3mA
Load Regulation-Voltage	≤0.01%+3mV			
Load Regulation-Current	≤0.01%+3mA	≤0.02%+3mA	≤0.01%+3mA	≤0.02%+3mA
DVM Measurement (For N3411P/N3412P Only)				
Channels	1CH			
Voltage Range	±600V/±60V/±6V			
Measurement Resolution	5½ digits			
Measurement Accuracy	0.01% + 0.01%F.S.			
Measurement Frequency	4Hz			
Input Impedance	10MΩ			
Terminal	Pluggable terminal			
Temperature Coefficient (0~40°C)	20ppm/°C			
Others				
Isolation (Output to Ground)	500V DC			
Communication Response Time	≤5ms			
Interface	LAN/RS232			
AC Input	Single phase, 220V AC±10%, frequency 47Hz~63Hz			
Temperature	Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C			
Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa			
Net Weight	Approx. 9kg		Approx. 11kg	
Dimension	2U, 88.0(H)*214.0(W)*413.0(D)mm		2U, 88.0(H)*214.0(W)*446.0(D)mm	

Note 1: For other specifications, please contact NGI.

Note 2: All specifications are subject to change without notice.

Technical Data Sheet (2)

Model	N3413/N3413P	
Channel	CH1/CH2	CH3
Voltage	60V	6V
Current	3A	3A
Series Mode-Voltage	120V	N/A
Parallel Mode-Current	6A	N/A
Total Power	378W	
Setting Resolution-Voltage	0.1mV	1mV
Setting Resolution-Current	0.1mA	1mA
Setting Accuracy-Voltage (23±5°C)	< 0.02% + 20mV	< 0.03% + 10mV
Setting Accuracy-Current (23±5°C)	< 0.05% + 5mA	< 0.05% + 10mA
Setting Temperature Coefficient	30ppm/°C	
Readback Resolution-Voltage	0.1mV	1mV
Readback Resolution-Current	0.1mA	1mA
Readback Accuracy-Voltage (23±5°C)	< 0.02% + 20mV	< 0.03% + 10mV
Readback Accuracy-Current (23±5°C)	< 0.05% + 5mA	< 0.05% + 10mA
Readback Temperature Coefficient	30ppm/°C	
Long-term Stability	≤50ppm/1000h	
Voltage Ripple Noise (20Hz ~ 20MHz)	≤10mVp-p	≤10mVp-p
Voltage Ripple Noise (20Hz ~ 20MHz)	≤1mVrms	
Current Ripple Noise (20Hz ~ 20MHz)	≤3mArms	
Dynamic Characteristics		
Voltage Rise Time (no load) (10%-90%F.S. Variation Time)	20ms	20ms
Voltage Rise Time (full load) (10%-90%F.S. Variation Time)	50ms	21ms
Voltage Fall Time (no load) (90%-10%F.S. Variation Time)	800ms	200ms
Voltage Fall Time (full load) (90%-10%F.S. Variation Time)	45ms	13ms
Transient Recovery Time	≤1ms	
Line Regulation-Voltage	≤0.01%+1mV	≤0.01%+3mV
Line Regulation-Current	≤0.01%+3mA	≤0.02%+3mA
Load Regulation-Voltage	≤0.01%+3mV	
Load Regulation-Current	≤0.01%+6mA	≤0.02%+3mA
DVM Measurement (For N3413P Only)		
Channels	1CH	
Voltage Range	±600V/±60V/±6V	
Measurement Resolution	5½ digits	
Measurement Accuracy	0.01% + 0.01%F.S.	
Measurement Frequency	4Hz	
Input Impedance	10MΩ	
Terminal	Pluggable terminal	
Temperature Coefficient (0~40°C)	20ppm/°C	
Others		
Isolation (Output to Ground)	500V DC	
Communication Response Time	≤5ms	
Interface	LAN/RS232	
AC Input	Single phase, 220V AC±10%, frequency 47Hz~63Hz	
Temperature	Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C	
Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa	
Net Weight	Approx. 11kg	
Dimension	2U, 88.0(H)*214.0(W)*446.0(D)mm	

Note 1: For other specifications, please contact NGI.

Note 2: All specifications are subject to change without notice.

Technical Data Sheet (3)

Model	N3411E		N3412E	
Channel	CH1/CH2	CH3	CH1/CH2	CH3
Voltage	32V	6V	32V	6V
Current	3A	3A	5A	3A
Series Mode-Voltage	64V	N/A	64V	N/A
Parallel Mode-Current	6A	N/A	10A	N/A
Total Power	210W		338W	
Setting Resolution-Voltage	10mV	1mV	10mV	1mV
Setting Resolution-Current	1mA			
Setting Accuracy-Voltage (23±5°C)	<0.01% + 20mV	<0.03% + 10mV	<0.01% + 20mV	<0.03% + 10mV
Setting Accuracy-Current (23±5°C)	<0.05% + 10mA		<0.05% + 20mA	<0.05% + 10mA
Setting Temperature Coefficient	50ppm/°C			
Readback Resolution-Voltage	10mV	1mV	10mV	1mV
Readback Resolution-Current	1mA			
Readback Accuracy-Voltage (23±5°C)	<0.01% + 20mV	<0.03% + 10mV	<0.01% + 20mV	<0.03% + 10mV
Readback Accuracy-Current (23±5°C)	<0.05% + 10mA		<0.05% + 20mA	<0.05% + 10mA
Readback Temperature Coefficient	50ppm/°C			
Long-term Stability	≤50ppm/1000h			
Voltage Ripple Noise (20Hz ~ 20MHz)	≤5mVp-p	≤10mVp-p	≤5mVp-p	≤10mVp-p
Voltage Ripple Noise (20Hz ~ 20MHz)	≤1mVrms			
Current Ripple Noise (20Hz ~ 20MHz)	≤3mA _{rms}			
Dynamic Characteristics				
Voltage Rise Time (no load) (10%-90%F.S. Variation Time)	20ms	20ms	20ms	20ms
Voltage Rise Time (full load) (10%-90%F.S. Variation Time)	50ms	21ms	50ms	21ms
Voltage Fall Time (no load) (90%-10%F.S. Variation Time)	400ms	200ms	400ms	200ms
Voltage Fall Time (full load) (90%-10%F.S. Variation Time)	45ms	13ms	45ms	13ms
Transient Recovery Time	≤1ms			
Line Regulation-Voltage	≤0.01%+1mV	≤0.01%+3mV	≤0.01%+1mV	≤0.01%+3mV
Line Regulation-Current	≤0.01%+1mA	≤0.02%+3mA	≤0.01%+3mA	≤0.02%+3mA
Load Regulation-Voltage	≤0.01%+3mV			
Load Regulation-Current	≤0.01%+3mA	≤0.02%+3mA	≤0.01%+3mA	≤0.02%+3mA
Others				
Isolation (Output to Ground)	500V DC			
Communication Response Time	≤5ms			
Interface	LAN/RS232			
AC Input	Single phase, 220V AC±10%, frequency 47Hz~63Hz			
Temperature	Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C			
Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa			
Net Weight	Approx. 9kg		Approx. 11kg	
Dimension	2U, 88.0(H)*214.0(W)*398.0(D)mm		2U, 88.0(H)*214.0(W)*446.0(D)mm	

Note 1: For other specifications, please contact NGI.

Note 2: All specifications are subject to change without notice.

Technical Data Sheet (4)

Model	N3413E	
Channel	CH1/CH2	CH3
Voltage	60V	6V
Current	3A	3A
Series Mode-Voltage	120V	N/A
Parallel Mode-Current	6A	N/A
Total Power	378W	
Setting Resolution-Voltage	10mV	1mV
Setting Resolution-Current	1mA	
Setting Accuracy-Voltage (23±5°C)	< 0.02% + 40mV	< 0.03% + 10mV
Setting Accuracy-Current (23±5°C)	< 0.05% + 10mA	
Setting Temperature Coefficient	50ppm/°C	
Readback Resolution-Voltage	10mV	1mV
Readback Resolution-Current	1mA	
Readback Accuracy-Voltage (23±5°C)	< 0.02% + 40mV	< 0.03% + 10mV
Readback Accuracy-Current (23±5°C)	< 0.05% + 10mA	
Readback Temperature Coefficient	50ppm/°C	
Long-term Stability	≤50ppm/1000h	
Voltage Ripple Noise (20Hz ~ 20MHz)	≤10mVp-p	≤10mVp-p
Voltage Ripple Noise (20Hz ~ 20MHz)	≤1mVrms	
Current Ripple Noise (20Hz ~ 20MHz)	≤3mArms	
Dynamic Characteristics		
Voltage Rise Time (no load) (10%-90%F.S. Variation Time)	20ms	20ms
Voltage Rise Time (full load) (10%-90%F.S. Variation Time)	50ms	21ms
Voltage Fall Time (no load) (90%-10%F.S. Variation Time)	800ms	200ms
Voltage Fall Time (full load) (90%-10%F.S. Variation Time)	45ms	13ms
Transient Recovery Time	≤1ms	
Line Regulation-Voltage	≤0.01%+1mV	≤0.01%+3mV
Line Regulation-Current	≤0.01%+3mA	≤0.02%+3mA
Load Regulation-Voltage	≤0.01%+3mV	
Load Regulation-Current	≤0.01%+6mA	≤0.02%+3mA
Others		
Isolation (Output to Ground)	500V DC	
Communication Response Time	≤5ms	
Interface	LAN/RS232	
AC Input	Single phase, 220V AC±10%, frequency 47Hz~63Hz	
Temperature	Operating temperature: 0°C~40°C, storage temperature: -20°C~60°C	
Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa	
Net Weight	Approx. 11kg	
Dimension	2U, 88.0(H)*214.0(W)*446.0(D)mm	

Note 1: For other specifications, please contact NGI.

Note 2: All specifications are subject to change without notice.