



Newton's4th Ltd

N4AX-03

Advanced AC+DC Power Source



7949

DC~3kHz Bandwidth [10kHz small signal]

Better than 0.3% THD

Isolated Output

Regenerative Option

0~270V & 0~135V RMS

0~11.1Arms & 0~22.2Arms Continuous

Stackable Parallel Option

Combine units to create a 3 Phase system [Delta/Star]

World Leading DC+AC[3kHz] Advanced Power Sources



ISOLATED PROGRAMMABLE 3kVA POWER SOURCE WITH A SINGLE PHASE UNIVERSAL INPUT

3kVA~27kVA - 2U High

White Goods, Aerospace, Consumer Electronics, Single and Three Phase
Parallel up to 9 units [27kVA] in single and 3 phase configuration
Arbitrary waveform generation including harmonic synthesis

IEC61000 Compliance

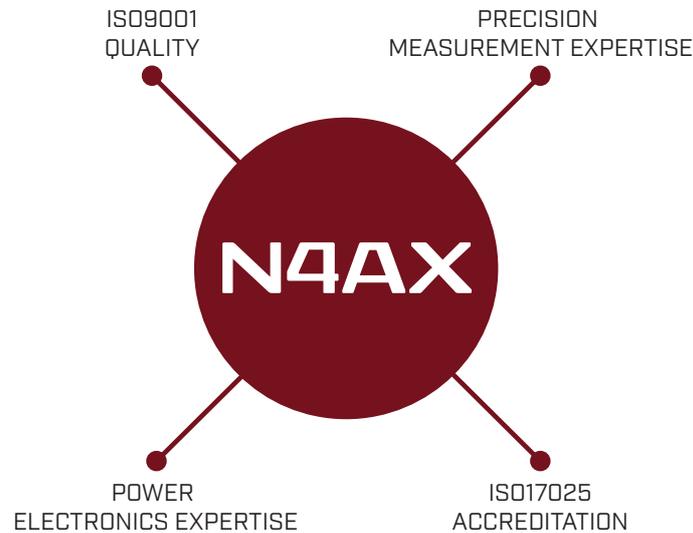


2U High

20 years experience in the power industry

N4L, formed in 1997 have been developing test and measurement instrument to the power electronics industry for over 20 years.

This experience and wealth of knowledge in a range of high precision measurement fields have been combined into developing a truly unique programmable power source, the N4AX.



High power density achieved through innovative design

The N4AX-03 provides 3kVA of output power from a 2U high 19in rack mountable chassis, this is achieved through innovative cooling design and highly efficient switching technology. Typical efficiencies of 85% are achieved.

The N4AX features a rectangular, fully enclosed cooling plenum which provides highly efficient heat sinking capabilities. Rapid heat dissipation is facilitated via a push-pull, force fed, front-to-back ventilation system.

Internal vanes within the cooling plenum increase the surface area improving cooling efficiencies.



**Efficient
Thermal Management**

The N4AX-03 heat sink ensures optimum cooling, resulting in unrivalled low operating temperatures of the power output stage. This is one of the many reasons that the N4AX-03 offers excellent reliability in the field as low operating temperature reduce component stress.

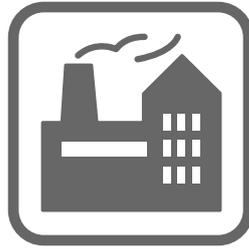
A versatile programmable AC+DC power source

The N4AX-D3 can be used in a variety of applications, from simple sine wave static frequency and magnitude generation to arbitrary and sequence event type signal generation.

This versatility provides a solution for research and development as well as production and test engineering applications.



Research and
Development



Manufacturing



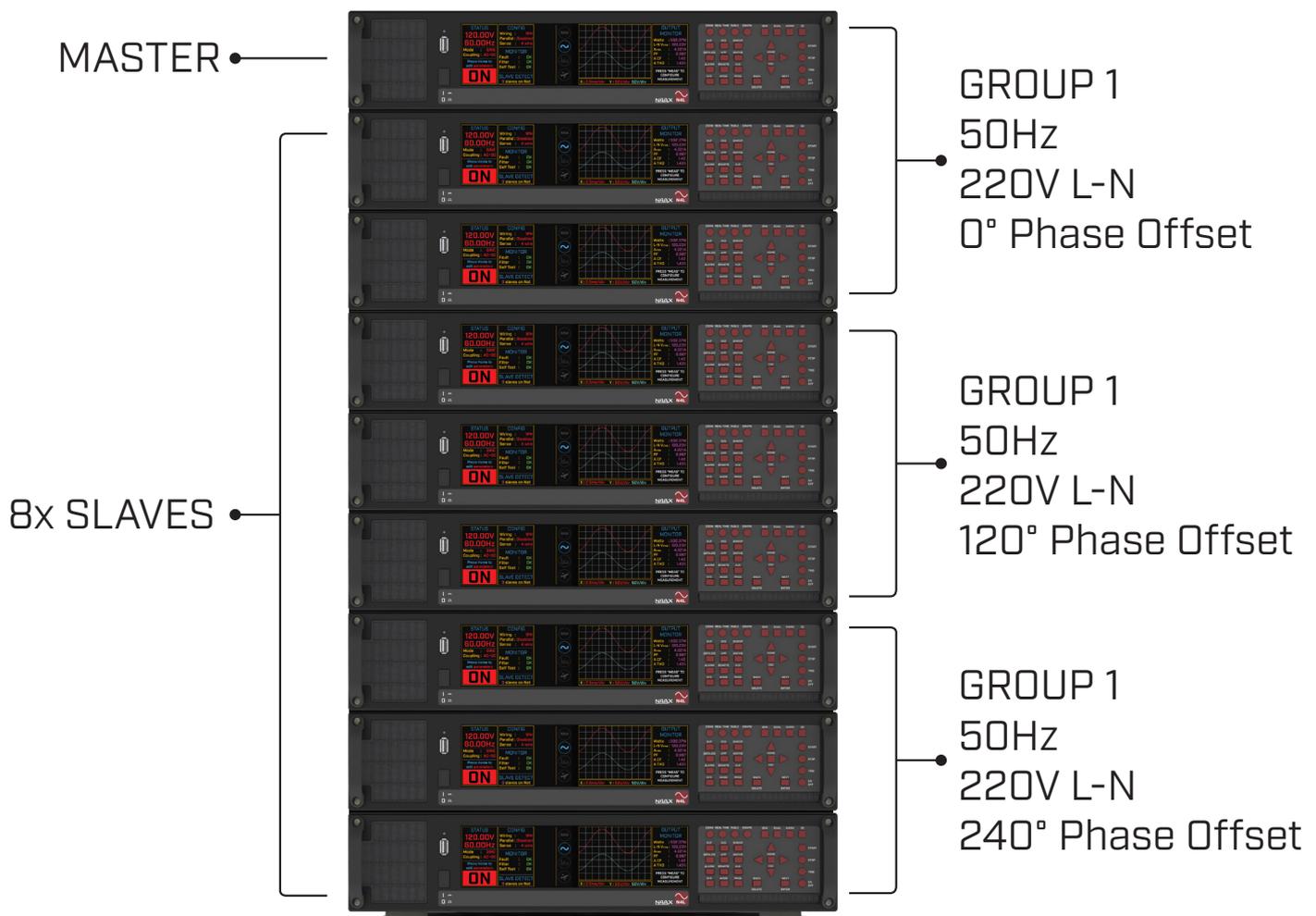
Product
Test

Expandable Power up to 27kVA - Single and Three Phase

The N4AX series of power sources can be connected together to form higher power and/or multiphase systems. Each N4AX can act as a master or a slave, this unique feature provides excellent redundancy if one of the modules fails during operation.

Units are connected together using a communication bus at the rear of the power source, the bus uses an RS-485 communication protocol which addresses each instrument. The allocated master then instructs each slave, instructing the slave to join a specific "group", set the output voltage, waveshape, any sequency and various other settings as required.

Example 27kVA Master Slave Configuration

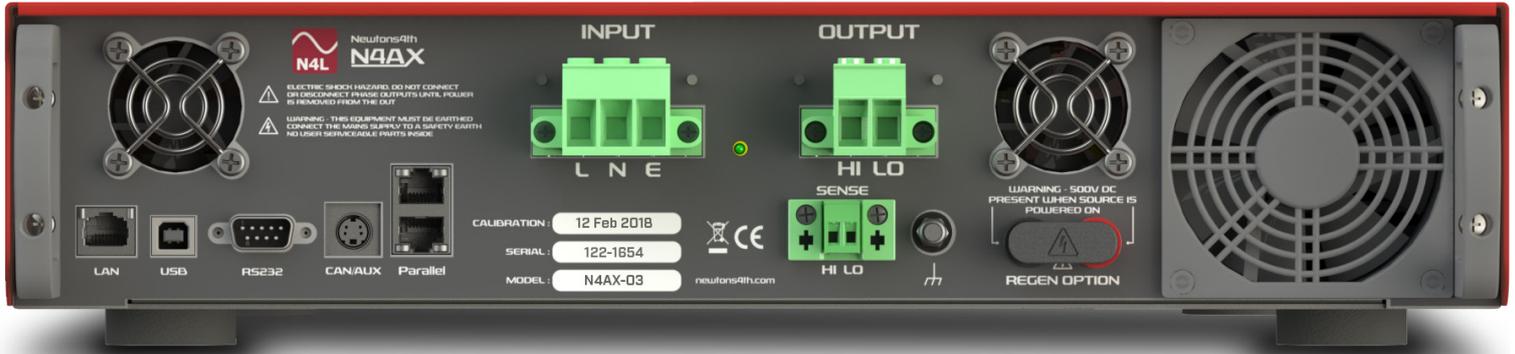


Rear Connections

The N4AX is furnished with a comprehensive array of communication interfaces including LAN, USB, RS232, CAN and a Parallel networking bus to control the N4AX when in master-slave configuration.

Input, Output and Sense terminals feature high quality removable connectors making connection and disconnection from a system extremely easy. Spare connectors are readily available from worldwide component stockists.

There is also a Regen Option connector on the rear of the N4AX which facilitates connection to a regen unit. N4L will be releasing the regen unit during 2018.



Example Applications

The N4AX can be used within a multitude of applications, this include Avionics, White goods, Consumer electronics, Automotive, Robotics, IEC61000 compliance, EN50564/IEC62301 compliance and many more.

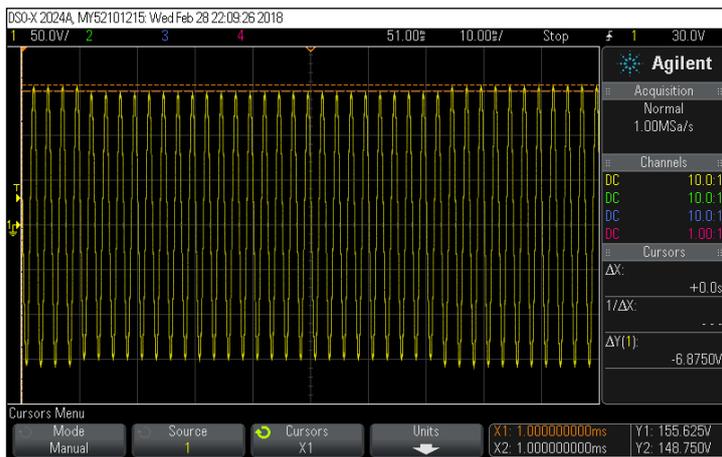


Avionics and Aerospace Testing

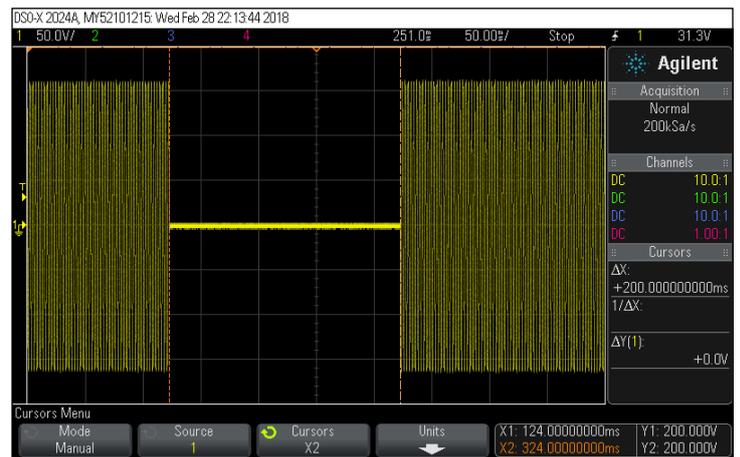
The N4AX series power sources exhibit a full power bandwidth of 3kHz, this wide bandwidth alongside low distortion output performance enables testing to DO-160, ABD0100 and MIL STD 704 Aerospace standards.

ABD0100, DO-160 and MIL STD 704 waveforms can be programmed via the front panel or communication interface.

Example DO-160 Waveforms



Waveform Example : DO-160 Section 16.5.1.2
(Voltage modulation, AC)



Waveform Example : DO-160 Section 16.5.1.4
(Momentary Power Interruptions, AC)

White Goods

The N4AX is well suited to both R&D as well as production burn in tests, the N4AX can be remotely programmed via the software supplied by N4L, Labview or your own custom software.

The N4AX features 2x inrush current capability for 3 seconds, this is particularly useful for loads which draw increased current during initial turn on.

Example White Goods Test Setup



Optional PPA3500 Power Analyzer



N4AX Power Source



Consumer Electronics

The N4AX is able to provide a highly stable, low distortion power waveform ideal for testing consumer electronics. An example application is development and test of AC/DC mobile phone chargers, where the N4AX can be paired up with a PPA500 or PPA1500 precision power analyzer to provide a complete measurement solution.

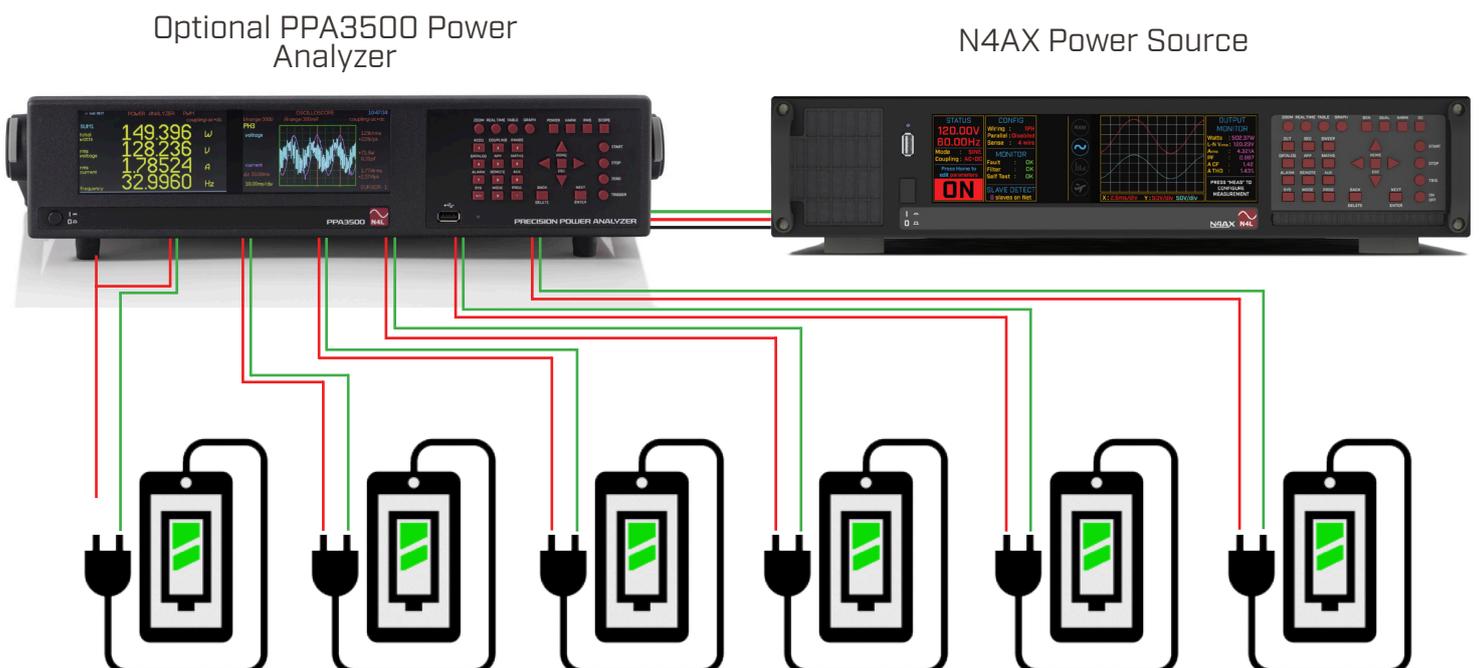
The N4AX can be employed to generate a constant sinusoidal output, or it can be configured to apply high levels of distortion, voltage sags or voltage surges to the device under test, for example.

Example Consumer Electronics Test Setup



Example Consumer Electronics Test Setup

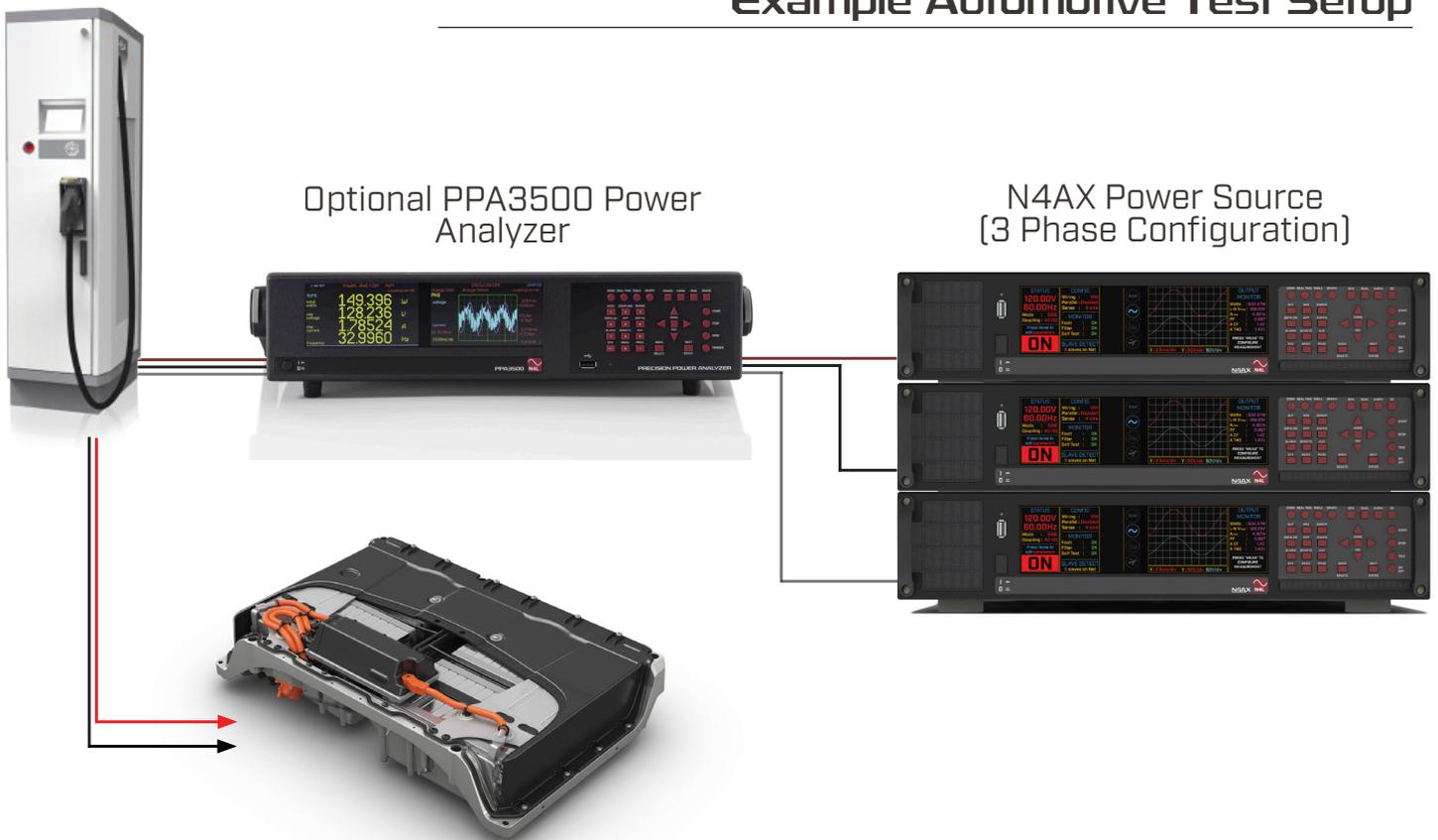
The N4AX, combined with a PPA3500 power analyzer can support simultaneous power supply and analysis of up to 6 DUT's. The example below shows 6 mobile phone battery chargers being simultaneously powered and analyzed by the N4AX and PPA3500.



Automotive Research, Development and Test

The N4AX is well suited to the automotive market as it is able to output both AC and DC waveform components. This makes the N4AX able to generate power for both automotive inverter design and test applications as well as development and test of grid connected charging systems.

Example Automotive Test Setup



IEC61000 Compliance Testing

The N4AX offers compliant testing capabilities to many of the IEC61000 EMC compliance and immunity tests. The N4AX offers a very low distortion output which is a key requirement of the Harmonics and Flicker standard. The output impedance is also extremely low, a key performance requirement of the flicker standard.

IEC61000 Compliance offered by the N4AX series

- IEC61000-3-2 [Harmonics up to 16A]
- IEC61000-3-3 [Flicker up to 16A]
- IEC61000-3-11 [Flicker up to 75A]
- IEC61000-3-12 [Harmonics up to 75A]
- IEC61000-4-11 [AC Dips, Interruptions and Variations]
- IEC61000-4-13 [Harmonic and Interharmonic immunity]
- IEC61000-4-17 [DC Ripple]
- IEC61000-4-29 [AC Dips, Interruptions and Variations]

N4L are the only IEC61000 test system manufacturer in the world with the ability to provide full coverage of the IEC61000-3-2/3/12/12 Harmonics and Flicker standards.*

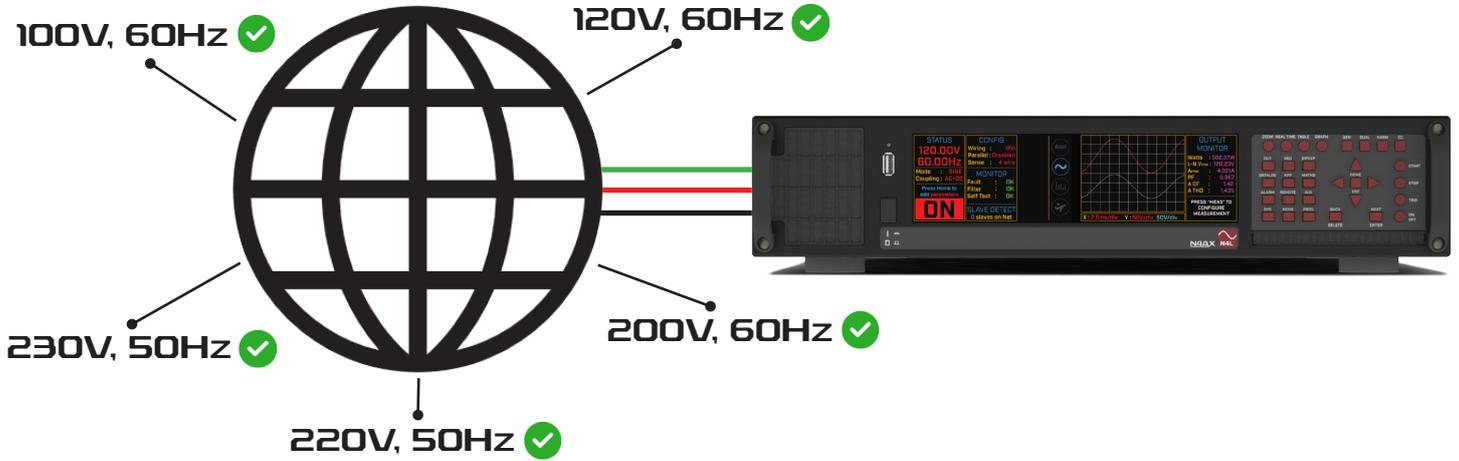


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*according to N4L market research, Feb 2018

Universal Ranging Active PFC Input

The N4AX AC power source features a universal ranging active PFC input stage enabling the N4AX to be connected to any grid voltage and frequency. No manual range selector is required and a power factor of >0.95 is maintained under all load conditions



"Easy Glide" Rack Mount System.

Power sources are often difficult to install and remove from a rack cabinet, the N4AX is available with an optional "easy glide" rack mount system which enables the user to easily slide the N4AX-03 Programmable Power Source in and out of the rack.



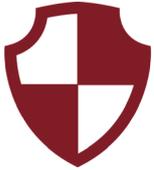
Example 9kVA, 3 Phase system consisting :

1x N4AX-03 in Master mode
2x N4AX-03 in Slave mode

Built in Safety Power Down and Redundancy

During parallel operation, it is important for any unit to power down the system should a fault occur. The N4AX series of power sources are able to signal to the rest of the system that a fault has occurred and immediate shut down of the system is initiated to protect the device under test as well as the remaining N4AX power sources. This is known as the “high speed kill function”.

As N4AX power sources can act as a master and a slave, even if the original master unit is in fault condition one of the remaining N4AX units can take over master responsibilities and system operation can resume. (see example below)



MASTER



SLAVE

SLAVE

SLAVE



MASTER

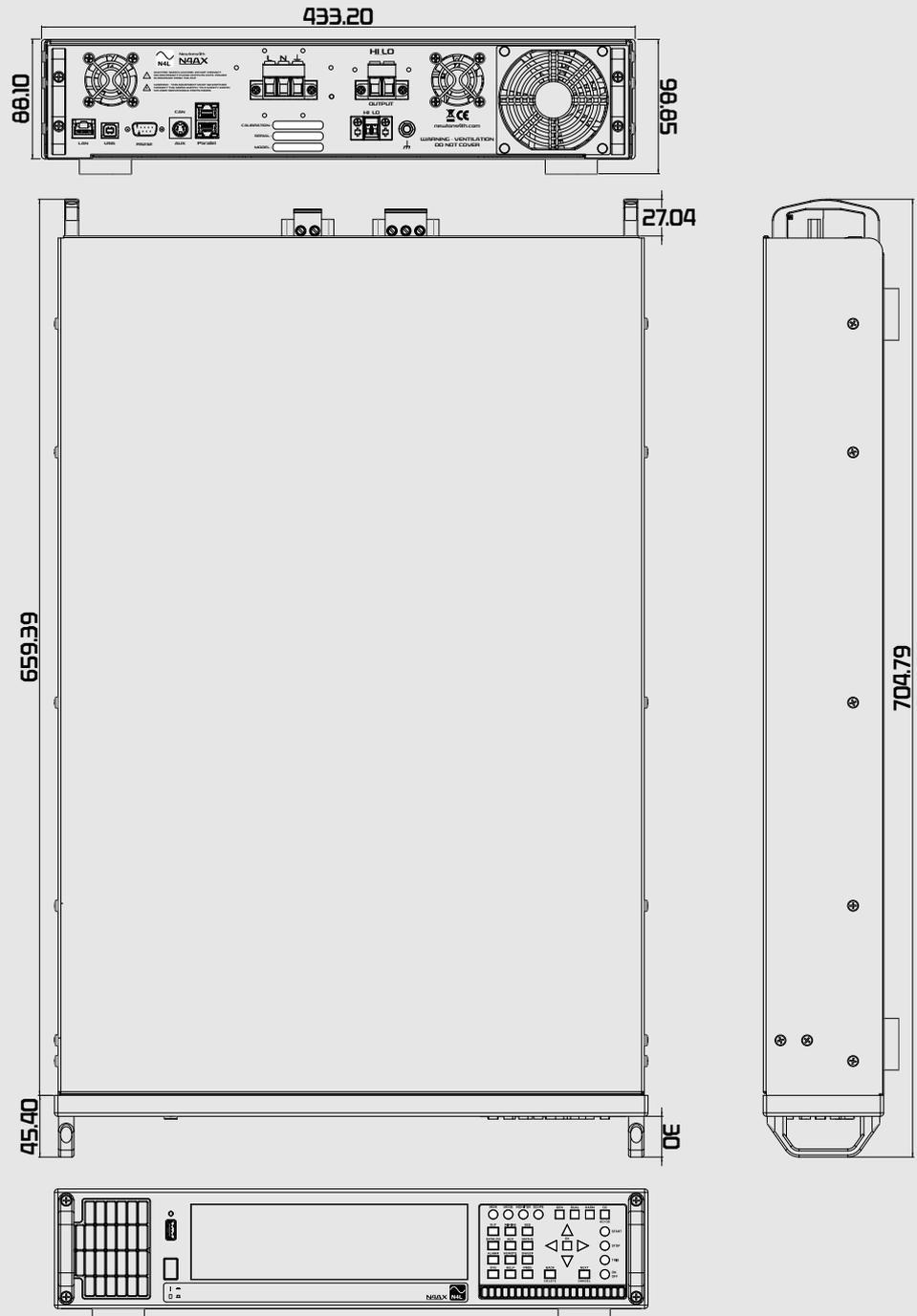
SLAVE

SLAVE



Mechanical Drawings

All dimensions in mm



N4AX-03 3kVA Power Source	
Nominal Output Power	3kVA
Output Voltage [AC]	High Range - 0-270Vrms Low Range - 0-135Vrms
Output Voltage [DC]	0-380V DC
Maximum Continuous Output Power	3kVA
Maximum Inrush Output power	2x IN for 3 sec 1.5x IN for 6 sec
Maximum Output current [continuous]	High Range - 11.1A, Low Range - 22.2A
Maximum Output current [Inrush]	High Range - 22.2A (3 sec), 16.65A (6 sec) Low Range 44.4A (3 sec), 33.3A (6 sec)
Output Frequency [Full Signal]	DC~3kHz
Output Frequency [Small Signal]	DC~10kHz
Slew rate	6V/μs
Output Voltage Stability/Regulation	Better than 0.1%
Output Voltage line regulation	Better than 0.1%
Output Voltage Accuracy	Better than 0.5%
THD	Better than 0.3% (at nominal output voltage with linear load)
Output Noise	<500mVrms
Recovery time of Output Waveform	Better than 50μs
Max Compensated Drop on Wires (w.r.t voltage setting)	5%
Recovery time of drop on wires	Less than 200ms
Maximum Crest Factor Output [Current]	4:1
Maximum number of parallel units stackable	9x3kVA (27kVA max)
Mechanical/Environmental	
Display	972x272 dot full colour super wide screen TFT, white LED backlit
Dimensions	2U High - 88Hx433Wx679D mm excluding feet
Weight	21.5kg
Input Power supply	1 Phase 90 ~ 270Vrms, 40 ~ 440Hz, 3.5kVAmax (7kVA inrush)
Operating Temperature	-5 to +40°C
Storage Temperature	-10 °C to +70°C
Input Topology	1 Phase, Isolated, Power Factor corrected, Auto-ranging



All specifications at 23°C ± 5°C . These specifications are quoted in good faith but Newtons4th Ltd reserves the right to amend any specification at any time without notice.

Newtons4th

Newtons4th Ltd (abbreviated to N4L) was established in 1997 to design, manufacture and support innovative electronic equipment to a worldwide market, specialising in sophisticated test equipment particularly related to phase measurement. The company was founded on the principle of using the latest technology and sophisticated analysis techniques in order to provide our customers with accurate, easy to use instruments at a lower price than has been traditionally associated with these types of measurements

Flexibility in our products and an attitude to providing the solutions that our customers really want has allowed us to develop many innovative functions in our ever increasing product range



THE QUEEN'S AWARDS
FOR ENTERPRISE:
INNOVATION
2010



Newtons4th Ltd

Distributed By :

Newtons4th Ltd
1 Bede Island Road
Leicester
LE2 7EA
UK

Phone: +44 (0)116 230 1066
Fax: +44 (0)116 230 1061
Email: sales@newtons4th.com
Web: www.newtons4th.com