**GENERAL OVERVIEW**

The NGLBC Series Military Inverter / Battery Chargers combine a pure sinewave 3 kW DC-AC Inverter with a regulated three-stage 72 AMP @ 28 VDC Output Battery Charger into one compact, fully integrated chassis. The machined aluminum enclosure’s form factor is only 6.7” high x 15.4” wide x 19.1” deep, with an overall weight of ~50.7 pounds. An advanced CANbus communication and host vehicle battery management suite are also included. These units are extremely rugged by design and fully qualified to MIL-STD-810 for temperature, altitude, sea salt and spray, sand and dust, shock, and vibration, as well as EMI per MIL-STD-461. These NGLBC units are ultra reliable and used worldwide on a variety of high profile mission critical vehicle applications, where light weight, high MTBF, and low MTTR are required. They can be easily customized with a variety of options such as alternative connectors or custom painting to fit almost any application from vehicular to aircraft.

**FULLY QUALIFIED TO**

**MIL-STD-810G**
- High Operating Temperature per Method 501.5, Proc. II Constant Temp Method
- High Storage Temperature per Method 501.5, Proc. I
- Low Operating Temperature per Method 502.5, Proc. II Constant Temp Method
- Low Storage Temperature per Method 502.5, Proc. I
- Humidity per MIL-STD-810G Method 507.5, Proc. II
- High Altitude Storage per Method 500.4, Proc. I
- High Altitude Operation per Method 500.4, Proc. II
- High Altitude-Rapid Decompression per Method 500.4, Proc. III
- Fungus per Method 508.6
- Sea Salt/Spray Corrosion per Method 509.5
- Sand and Dust per Method 510.5 Procedure I (Blowing Dust) & Procedure II (Blowing Sand)
- Vibration per Method 514.6 Procedure I
- Shock per Method 516.6 Procedure I

**MIL-STD-461F:**
- CS101, CS114, CS115, CS116, RS103, CE102,* and RE102**
  * Exceptions permitted to CE102 at 33 KHz
  ** Exceptions permitted to RE102 at 42-45 MHz and 190 MHz

**IEC 61000-4-2:**
- Electrostatic Discharge

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**POPULAR OPTIONS**

- Special output voltages and frequencies
- Alternative connectors
- Custom painting and marking

**CONTACT**

100 School Street,
Bergenfield, NJ 07621 USA

(201) 385-0500

novaelectric.com
info@novaelectric.com

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**The Leader In Rugged Power Conversion Technology Since 1966**
120 VAC MODEL NGLBC3K-24-120/24VDC DETAILED OVERVIEW

NGLBC3K-24-120/24VDC consists of the following major blocks: Inverter Mode Functional Block, Charger Mode Functional Block and CANBus / Diagnostic Board Functional Block.

Inverter Mode Functional Block (DC-AC): The 24VDC Battery Input is applied to DC IN J5(+) / J6 (-) Connectors, EMI Filter, DC IN CB1 Breaker, A1 3KW Inverter Module (Converts 28VDC to 120VAC 60Hz 25A max,) and then to Transfer Switch Relay K1. This is followed by AC OUT CB4 Breaker and AC OUT Connectors J1 / J2. The AC OUT is also tapped off and provided to AUX AC CB2 and to AC AUX OUT (p/o J3 Connector.)

Charger Mode Functional Block (AC-DC): The 115VAC 50/60Hz Shore Power is applied to AC IN J4 Connector, EMI Filter FL1, AC IN CB3 Breaker, Transfer Relay K1, followed by AC OUT CB4 Breaker and AC OUT Connectors J1 / J2 and to AC AUX OUT (p/o J3.) In addition, the AC IN from CB3 is also routed to A2 3KW Battery Charger Module (Converts 110 VAC to 28VDC @72A max.) The Charger's 28VDC @72A is routed to CB1 Breaker and on to J5(+) / J6 (-) Connectors to charge external host vehicle batteries.

Battery Temp Interface / Diagnostic Board Functional Block: The NGLBC contains an A3 Battery Interface Board which (in conjunction with A4 Diagnostic Board) monitors internal Voltages / Status and controls the operation of the unit. The Battery Interface Board interfaces with the Charger Module via an I2C Bus (internal) and to the Inverter Module directly (hardwired.) The External Host System provides battery temperature information to NGLBC via an External Temp Sensor in order to control the Charger output voltage / mode via p/o J3 Connector.

The frequency and amplitude of Inverter stage is regulated. The DC Output of the Charger is regulated and controlled via the Temp Sensor Input. The NGLBC is designed with over-load and over-temperature protections. The unit is equipped with internal AC/DC Fans for cooling. It draws air from the left side air inlets and exhausts the warm air from the right side air outlets.
220 VAC MODEL NGLBC3K-28-220/28VDC DETAILED OVERVIEW

NGLBC3K-28-220/28VDC consists of the following major blocks: Inverter Mode Functional Block, Charger Mode Functional Block and CANBus / Diagnostic Board Functional Block.

**Inverter Mode Functional Block (DC-AC):** The 28VDC Battery Input is applied to DC IN J5(+) / J6 (-) Connectors, EMI Filter, DC IN CB1 Breaker, A1 3KW Inverter Module (converts 28VDC to 220VAC 60Hz 13.6A / 230VAC 50Hz 13.04A Max.) and then to Transfer Switch Relay K1. This is followed by AC OUT CB4 Breaker and AC OUT Connectors J1 / J2.

**Charger Mode Functional Block (AC-DC):** The 220VAC 50/60Hz Shore Power is applied to AC IN J4 Connector, EMI Filter FL1, AC IN CB3 Breaker, Transfer Relay K1, followed by AC OUT CB4 Breaker and AC OUT Connectors J1 / J2. In addition, the AC IN from CB3 is also routed to A2 3KW Battery Charger Module (converts 220 VAC to 28VDC @82A Max.) The Charger Output is split / routed to 2 places: The 28VDC @72A is routed to CB1 Breaker and on to J5(+) / J6 (-) Connectors to charge external host vehicle batteries. The 28VDC @10A is routed to AUX OUT CB3 Breaker and then through AUX OUT Relay K2 to AUX OUTPUT J3 Connector.

**CANBus / Diagnostic Board Functional Block:** The NGLBC contains A3 CAN Bus Board which (in conjunction with A4 Diagnostic Board monitors) internal Voltages / Status and controls the operation of the unit. The CANBus Board interfaces with the Charger Module via an I2C Bus (internal) and to the Charger Module directly (hardwired.) The CANBus Board also interfaces to the External Host System via the CANBus Interface J3 Connector. The External Host System (via CANBus Interface) can issue commands / provide battery temperature information to NGLBC Unit and also read back status from the NGLBC Unit. The frequency and amplitude of Inverter stage is regulated and switchable via the CANBus.

The DC Output of the Charger is regulated and controlled via the CANBus. The NGLBC is designed with over-load and over-temperature protections. The unit is equipped with internal AC/DC Fans for cooling. It draws air from the left side air inlets and exhausts the warm air from the right side air outlets.

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**Contact:**

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The Leader In Rugged Power Conversion Technology Since 1966
## TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td>NGLBC3K-24-120/24VDC</td>
</tr>
<tr>
<td><strong>DC Input Voltage (Inverter Mode)</strong></td>
<td>28VDC Nominal (23VDC –32VDC)</td>
</tr>
<tr>
<td><strong>DC Input Current</strong></td>
<td>130A Max</td>
</tr>
<tr>
<td><strong>Temp Sensor Input Wiring</strong></td>
<td>Temp Sense 1 (Gn) J3-D, Temp Sense 2 (Blk) J3-E</td>
</tr>
<tr>
<td><strong>Input Power Control Circuit Breaker</strong></td>
<td>DC CB1, 3PST (3×75=225A), AC In, CB3, DPST, 2×20=40A</td>
</tr>
<tr>
<td><strong>Output Power Control Circuit Breaker</strong></td>
<td>AC Out, CB4, 30A, SPST, GFI AC OUT, CB5, 5A, Aux AC, CB2, 2.5A</td>
</tr>
<tr>
<td><strong>AC Output (Inverter Mode)</strong></td>
<td>120VAC ±5% 60Hz ±1Hz, 25A/3KW (J1, J2) <strong>Surge Rating:</strong> 3.5KW for a Max. of 5 sec.</td>
</tr>
<tr>
<td><strong>AC Output (Charger Mode)</strong></td>
<td>28VDC ±5%, 72A, 2KW (J5 (+), J6 (-))</td>
</tr>
<tr>
<td><strong>AC AUX OUT (Inverter Mode)</strong></td>
<td>120VAC ±5%, 2.5A, 300W (J3-A (-L), J3-B (N))</td>
</tr>
<tr>
<td><strong>AC Output Regulation (Line / Load)</strong></td>
<td>±5%</td>
</tr>
<tr>
<td><strong>Output Power Control (Total)</strong></td>
<td>Inverter: 3 KW / Charger: 2.0KW</td>
</tr>
<tr>
<td><strong>Total Harmonics Distortion (THD)</strong></td>
<td>≤ 5%</td>
</tr>
<tr>
<td><strong>Efficiency (Inverter / Charger)</strong></td>
<td>≥ 80%</td>
</tr>
<tr>
<td><strong>Input / Output Isolation</strong></td>
<td>Galvanic Isolation between Input &amp; Output</td>
</tr>
<tr>
<td><strong>Protection Levels</strong></td>
<td>Over Load, Over Temperature, Over Voltage/Under Voltage Protection on Inputs/Outputs.</td>
</tr>
<tr>
<td><strong>Protection Levels</strong></td>
<td>AC OL ≥ 27.5A, AC OV ≥ 140VAC, OT ≥ 90DegC DC OV ≥ 50VDC, DC UV ≤ 18VDC</td>
</tr>
<tr>
<td><strong>Indicators</strong></td>
<td>Status, DC, AC Aux Out, AC In, AC Out, GFI Trip</td>
</tr>
<tr>
<td><strong>Conformal Coating</strong></td>
<td>Inverter-Charger Unit Electronics Components All PCBs Conformal Coated</td>
</tr>
<tr>
<td><strong>Operating Temperature</strong></td>
<td>-40° C to +49° C</td>
</tr>
<tr>
<td><strong>Storage Temperature</strong></td>
<td>-46° C to +71° C</td>
</tr>
<tr>
<td><strong>Operating Humidity</strong></td>
<td>≤ 95% NC</td>
</tr>
<tr>
<td><strong>Vibration</strong></td>
<td>MIL-STD-810G Method 514.6</td>
</tr>
<tr>
<td><strong>Shock</strong></td>
<td>MIL-STD-810G Method 516.6</td>
</tr>
<tr>
<td><strong>Electromagnetic Interference</strong></td>
<td>To MIL-STD-461F For Ground Army - CS101, CS114, CS115, CS116, RS103, CE102,* and RE102** * Exceptions permitted to CE102 at 33 KHz ** Exceptions permitted to RE102 at 42-45 MHz and 190 MHz</td>
</tr>
<tr>
<td><strong>Elevation</strong></td>
<td>Operating: 15,000 ft, Non-Operating: 15,000 ft</td>
</tr>
<tr>
<td><strong>Cooling</strong></td>
<td>Forced Air by Internal Module Fans</td>
</tr>
<tr>
<td><strong>Dimensions / Weight</strong></td>
<td>13.9&quot;W x 6.7&quot;H x 18.5&quot;D (340mm W x 170mm H x 470mm D) Chassis, w/o Side Vents, 23 Kg/ 50.7 lbs Max Wt. (Approx.)</td>
</tr>
<tr>
<td><strong>Chassis Grounding</strong></td>
<td>Ground Bonding Stud: M6</td>
</tr>
</tbody>
</table>

*Specifications subject to change without notice.*
NGLBC3K-24-120/24VDC OUTLINE DRAWINGS

NOTES:
1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
3. ALL UNDIMENSIONED PICTORIAL CONFIGURATIONS ARE FOR REFERENCE ONLY.
4. CLAMP AND SHELL TYPE CLASS 3 AND CRADLE AND SHELL TYPE 1050.
5. COLOR OF METAL AND ELECTRICAL PARTS ARE TO BE DETERMINED.
6. ALL SYMBOLS ARE STANDARD IEEE S-125.
7. MIL-STD-188-209A (SILICON-BASED) APPLICABLE.
8. THIS DRAWING IN DESIGN AND DETAIL. ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.
9. TOLERANCES UNLESS OTHERWISE SPECIFIED
   .XX = ± .02
   .XXX = ± .005
   ANGLE = ± 1/2°
10. CONNECTION WITH OUR WORK.
11. IS NOVA ELECTRIC PROPERTY
12. DO NOT SCALE DRAWING
13. THIS DOCUMENT AND THE DATA DISCLOSED HEREIN OR HEREWITH IS NOT TO BE PRODUCED, USED, OR DISCLOSED IN WHOLE OR IN PART TO ANYONE WITHOUT THE EXPRESS WRITTEN PERMISSION OF NOVA.

1. EDGES TO BE ROUNDED WITH A MINIMUM RADIOUS OF 0.177" (4.5mm)
2. ALL DIMENSIONS ARE IN INCHES & MM, UNLESS OTHERWISE SPECIFIED.
3. ALL UNDIMENSIONED PICTORIAL CONFIGURATIONS ARE FOR REFERENCE ONLY.
4. FINISH:
   CHEM FILM 5541 TYPE II CLASS 3 AND PAINT IAW MIL-T-704, TYPE G.
   COLOR TO BE WHITE IAW FED-STD-595 COLOR CHIP NUMBER FS 1792.
   ALL ALUMINUM SURFACES CLEAR IRRIDITED.
5. SILK-SCREEN IN BLACK EPOXY INK.
6. UNIT WEIGHT: ≤ 23 KG (≤ 50.7LB).
NGLBC3K-28-220/28VDC OUTLINE DRAWINGS

NOTES:
1. DO NOT SCALE FROM THIS DRAWING.
2. DRAWING IS FOR INQUIRY ONLY AND NOT FOR REPRODUCTION.
3. TOLERANCES UNLESS OTHERWISE SPECIFIED:
   .XX = ± .02
   .XXX = ± .005
   ANGLE = ± 1/2°
4. CONNECTION WITH OUR WORK. IS NOVA ELECTRIC PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH OUR WORK.
5. DO NOT SCALE DRAWING FROM THIS DRAWING.
6. DESIGN IN DETAIL AND ALL RIGHTS OF DESIGN OR INVENTION ARE RESERVED.
7. TOLERANCES UNLESS OTHERWISE SPECIFIED.
8. FILED FILM 5541 TYPE II CLASS 3 AND PAINT IAW MIL-T-704, TYPE G.
9. COLOR TO BE WHITE IAW FED-STD-595 COLOR CHIP NUMBER FS 17925.
10. ALL ALUMINUM SURFACES CLEAR IRRIDITED.
11. SILK-SCREEN IN BLACK EPOXY INK.
12. UNIT WEIGHT: ≤ 23 KG (≤ 50.7LB).
13. THIS DOCUMENT AND THE DATA DISCLOSED HEREIN OR HEREWITH IS NOT TO BE PRODUCED, USED, OR DISCLOSED IN WHOLE OR IN PART TO ANYONE WITHOUT THE EXPRESS WRITTEN PERMISSION OF NOVA.
RUGGED AC POWER SYSTEMS


RUGGED TRUE ONLINE UPS
500 W – 500+ KW
Rack Mount, Bulkhead Mount, and Freestanding
Single and Three Phase
50, 60, and 400 Hz.

PURE SINEWAVE DC-AC INVERTERS
100 W – 500+ KW
Rack Mount, Bulkhead Mount, and Freestanding
Single and Three Phase
50, 60, and 400 Hz.

SOLID-STATE FREQUENCY CONVERTERS
100 W – 500+ KW
Rack Mount, Bulkhead Mount, and Freestanding
Single and Three Phase
50, 60, and 400 Hz.

POWER DISTRIBUTION UNITS (PDUs)
Basic, Switched, Auto-Transfer Switching, and Metered Configurations
Rack Mount, Bulkhead Mount, and Freestanding
Single and Three Phase

CUSTOM EMI FILTERS
For MIL-STD-461 Compliance
Rack Mount, Bulkhead Mount, and Freestanding
Single and Three Phase

RUGGED PORTABLE TRANSFORMERS
100 W – 500+ KW
Rack Mount, Bulkhead Mount, and Freestanding
Single and Three Phase

EXTERNAL MAINTENANCE BYPASS SWITCHES (MBSs)
Rack Mount, Bulkhead Mount, and Freestanding
Single and Three Phase

CUSTOM DESIGNS
Designed & Built to Spec
Integrated AC & DC Capabilities
Multiple Outputs

RUGGED TRUE ONLINE UPS
500 W – 500+ KW
Rack Mount, Bulkhead Mount, and Freestanding
Single and Three Phase
50, 60, and 400 Hz.

PURE SINEWAVE DC-AC INVERTERS
100 W – 500+ KW
Rack Mount, Bulkhead Mount, and Freestanding
Single and Three Phase
50, 60, and 400 Hz.

SOLID-STATE FREQUENCY CONVERTERS
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POWER DISTRIBUTION UNITS (PDUs)
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Single and Three Phase

EXTERNAL MAINTENANCE BYPASS SWITCHES (MBSs)
Rack Mount, Bulkhead Mount, and Freestanding
Single and Three Phase

CUSTOM DESIGNS
Designed & Built to Spec
Integrated AC & DC Capabilities
Multiple Outputs

RELIABLE AC POWER WHEN AND WHERE YOU NEED IT
SEVERE ENVIRONMENT PRODUCTS

• AIRBORNE
• SHIPBOARD
• MOBILE
• RACK MOUNT & FREESTANDING
• 50, 60, AND 400 Hz
• AIR & WATER COOLED
• SINGLE AND THREE PHASE
• LIGHTWEIGHT DESIGNS

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Some optional equipment shown. Specifications subject to change without notice.