NGLBC-Series Rugged Integrated DC-AC Inverter / Battery Charger

NOVA ELECTRIC

120 VAC MODEL

- NGLBC3K-24-120/24VDC

220 VAC MODEL

- NGLBC3K-28-220/28VDC

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

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

The Leader In Rugged Power Conversion Technology Since 1966

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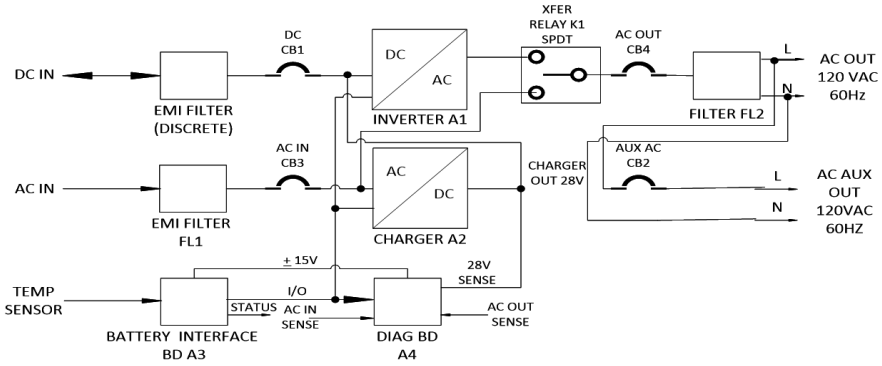
120 VAC MODEL NGLBC3K-24-120/24VDC DETAILED OVERVIEW

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.

Typical NGLBC3K-24-120/24VDC

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120 VAC MODEL

- NGLBC3K-24-120/24VDC

220 VAC MODEL

- NGLBC3K-28-220/28VDC

POPULAR OPTIONS

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220 VAC MODEL NGLBC3K-28-220/28VDC DETAILED OVERVIEW

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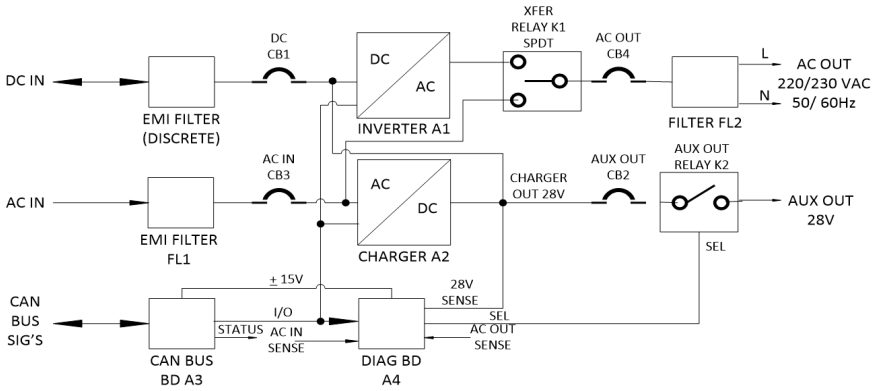


Inverter Mode Functional Block (DC-AC): The 28VDC Battery Input is applied to DC IN J5(+) / J6 (-) Connectors, EMI Filter, DC IN CB1 Breaker, A1 3KW Inverter Module (converts 28VDC to 220VAC 60Hz 13.6A / 230VAC 50Hz 13.04A Max.) and then to Transfer Switch Relay K1. This is followed by AC OUT CB4 Breaker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

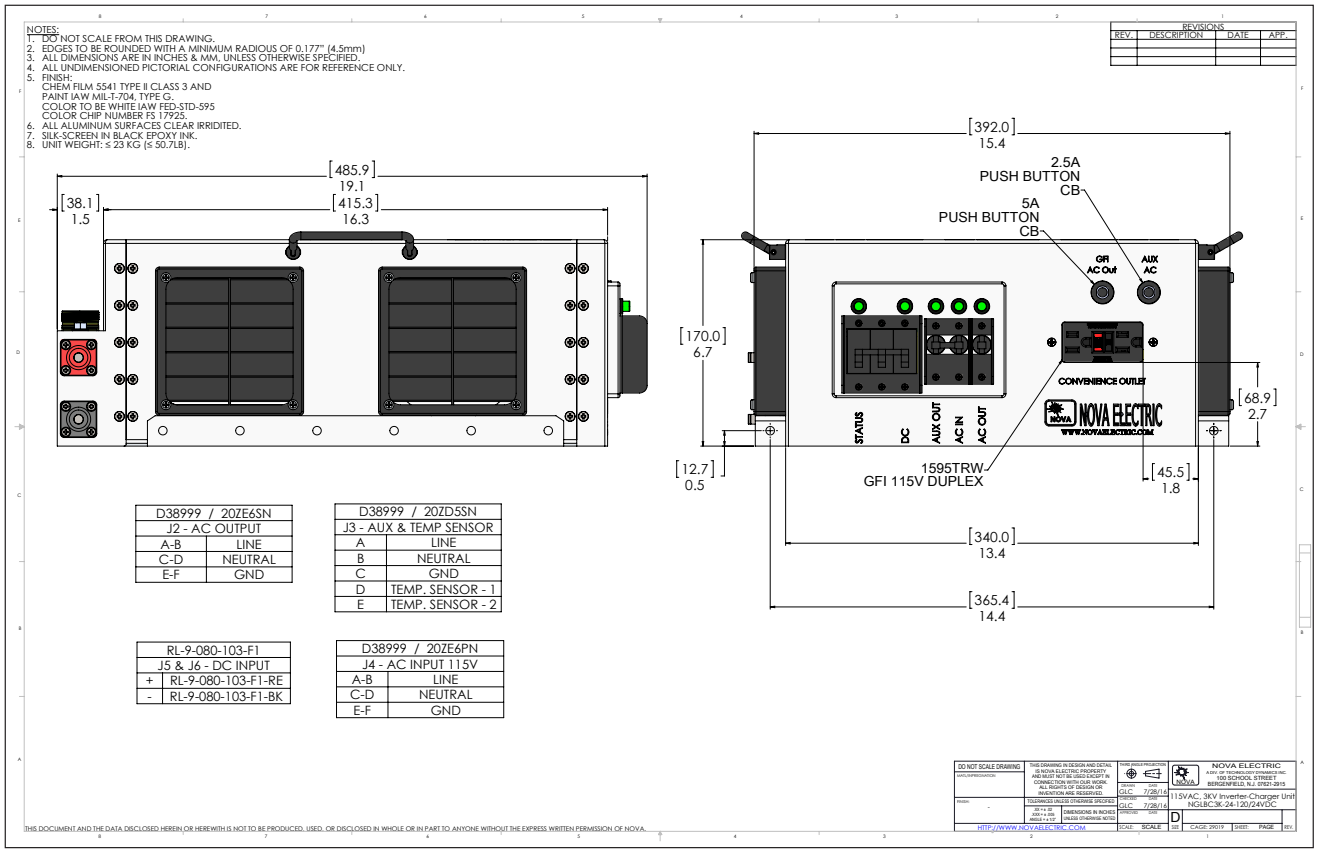
Typical NGLBC3K-28-220/28VDC

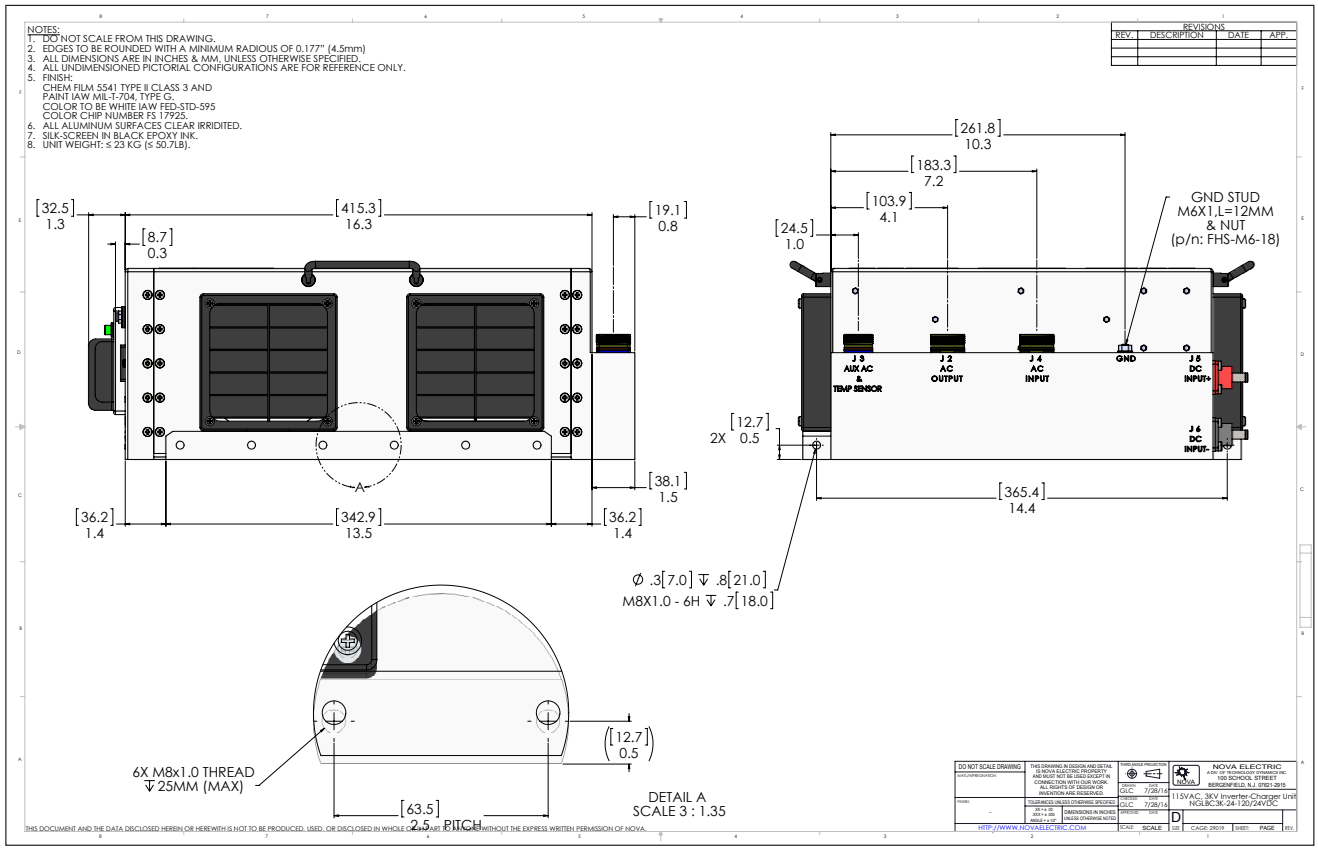
TECHNICAL SPECIFICATIONS

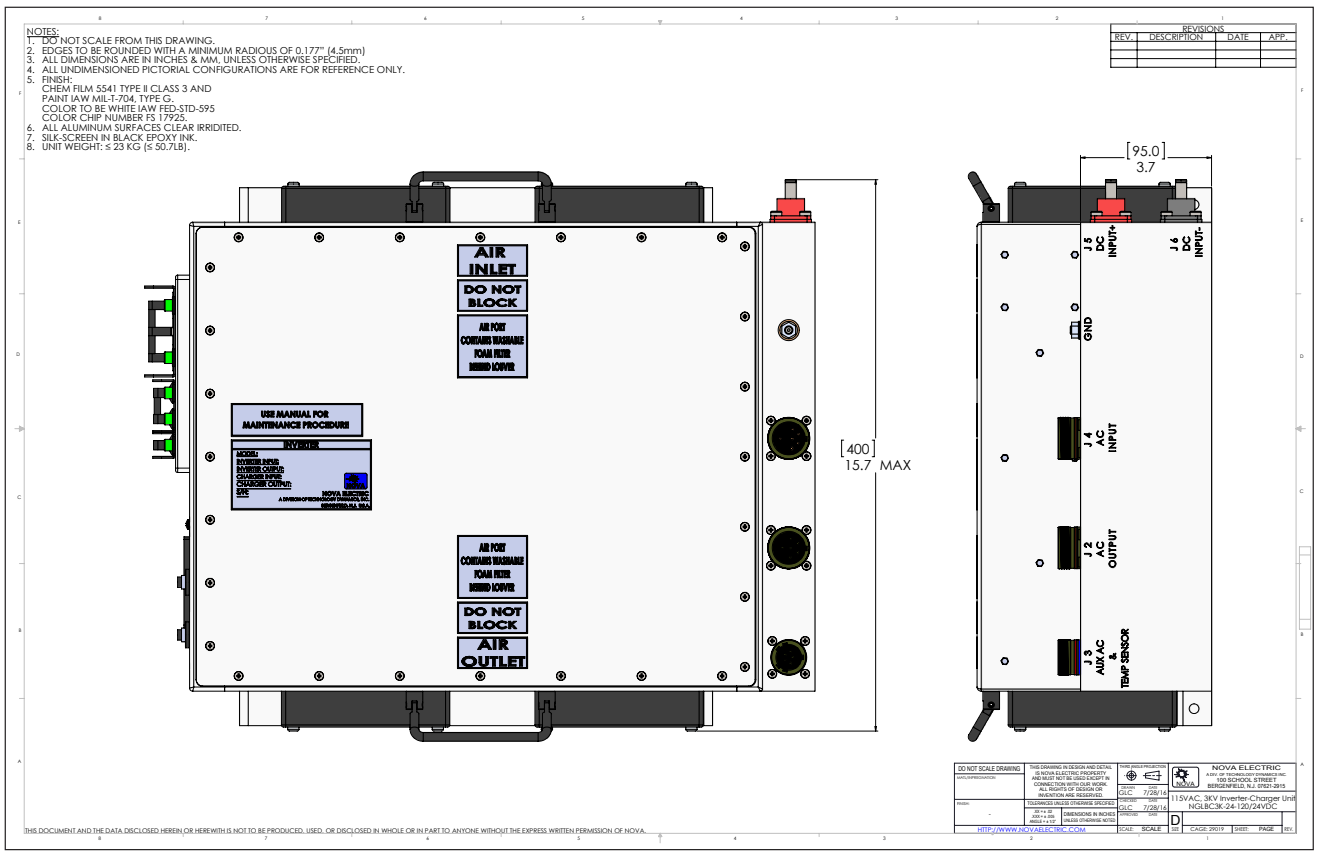
PARAMETER	VALUES	
Model	**NGLBC3K-24-120/24VDC**	**NGLBC3K-28-220/28VDC**
DC Input Voltage *(Inverter Mode)*	28VDC Nominal (23VDC –32VDC)	28VDC Nominal (23VDC –32VDC)
DC Input Current	130A Max	130A Max
Temp Sensor Input Wiring	Temp Sense 1 (Grn) J3-D, Temp Sense 2(Blk) J3-E	DC CB1, 3PST (3×60=180A), AC In, CB3, 15A, SPST
Input Power Control Circuit Breaker	DC CB1, 3PST (3×75=225A), AC In, CB3, DPST, 2×20=40A)	DC CB1, 3PST (3x60=180A), AC In, CB3, 15A, SPST
Output Power Control Circuit Breaker	AC Out, CB4, 30A, SPST, GFI AC OUT, CB5, 5A, Aux AC, CB2, 2.5A	AC Out, CB4, 20A, SPST, Aux Out, CB2, 10A, SPST
AC Output *(Inverter Mode)* **Full Load / Surge Power & Duration**	120VAC ±5% 60Hz ±1Hz, 25A/3KW (J1, J2) **Surge Rating:** 3.5KW for a Max. of 5 sec.	220VAC ±5% 60Hz ±1Hz / 230VAC ±5% 50Hz ±1Hz, 13.6A/13.04A, 3KW (J1, J2) **Surge Rating:** 3.5KW for a Max. of 5 sec.
DC Output *(Charger Mode)*	28VDC ±5%, 72A, 2KW (J5 (+), J6 (-))	28VDC ±5%, 72A, 2KW (J5 (+), J6 (-))
AC AUX OUT *(Inverter Mode)*	120VAC ±5%, 2.5A, 300W (J3-A- (L), J3-B (N))	28VDC ±5%, 10A, 280W (J3-C (+), J3-D (-))
AC Output Regulation *(Line / Load)*	±5%	±5%
Output Power *(Total)*	Inverter: 3 KW / Charger: 2.0KW	Inverter: 3 KW / Charger: 2.3KW
Total Harmonics Distortion *(THD)*	≤ 5%	≤ 5%
Efficiency *(Inverter / Charger)*	≥ 80%	≥ 80%
Input / Output Isolation	Galvanic Isolation between Input & Output	Galvanic Isolation between Input & Output
Protections	Over Load, Over Temperature, Over Voltage/ Under Voltage Protection on Inputs/Outputs.	Over Load, Over Temperature, Over Voltage/ Under Voltage Protection on Inputs/Outputs.
Protection Levels	AC OL ≥ 27.5A, AC OV ≥ 140VAC, OT ≥ 90DegC DC OV ≥ 50VDC, DC UV ≤ 18VDC	AC OL ≥ 20A, AC OV ≥ 250VAC, OT ≥ 90DegC DC OV ≥ 50VDC, DC UV ≤ 18VDC
Indicators	Status, DC, AC Aux Out, AC In, AC Out, GFI Trip	Status, DC, Aux Out, AC In, AC Out, GFCI Trip
Conformal Coating	Inverter-Charger Unit Electronics Components All PCBs Conformal Coated	Inverter-Charger Unit Electronics Components All PCBs Conformal Coated
Operating Temperature	-40° C to +49° C	-40° C to +49° C
Storage Temperature	-46° C to +71° C	-46° C to +71° C
Operating Humidity	≤ 95% NC	≤ 95% NC
Vibration	MIL-STD-810G Method 514.6	MIL-STD-810G Method 514.6
Shock	MIL-STD-810G Method 516.6	MIL-STD-810G Method 516.6
Electromagnetic Interference	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*	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*
Elevation	Operating: 15,000 ft, Non-Operating: 15,000 ft	Operating: 15,000 ft, Non-Operating: 15,000 ft
Cooling	Forced Air by Internal Module Fans	Forced Air by Internal Module Fans
Dimensions / Weight	13.9" W x 6.7" H x 18.5" D *(340mm W x 170mm H x 470mm D)* Chassis, w/o Side Vents, 23 Kg/ 50.7 lbs Max Wt. (Approx.)	13.9" W x 6.7" H x 18.5" D *(340mm W x 170mm H x 470mm D)* Chassis, w/o Side Vents, 23 Kg/ 50.7 lbs Max Wt. (Approx.)
Chassis Paint	IAW-MIL-T-704 Type G, Color White Semi-Gloss IAW-FED-STD-595 Color Chip# 17925	IAW-MIL-T-704 Type G, Color White Semi-Gloss IAW-FED-STD-595 Color Chip# 17925
Chassis Grounding	Ground Bonding Stud: M6	Ground Bonding Stud: M6

**Specifications subject to change without notice.*

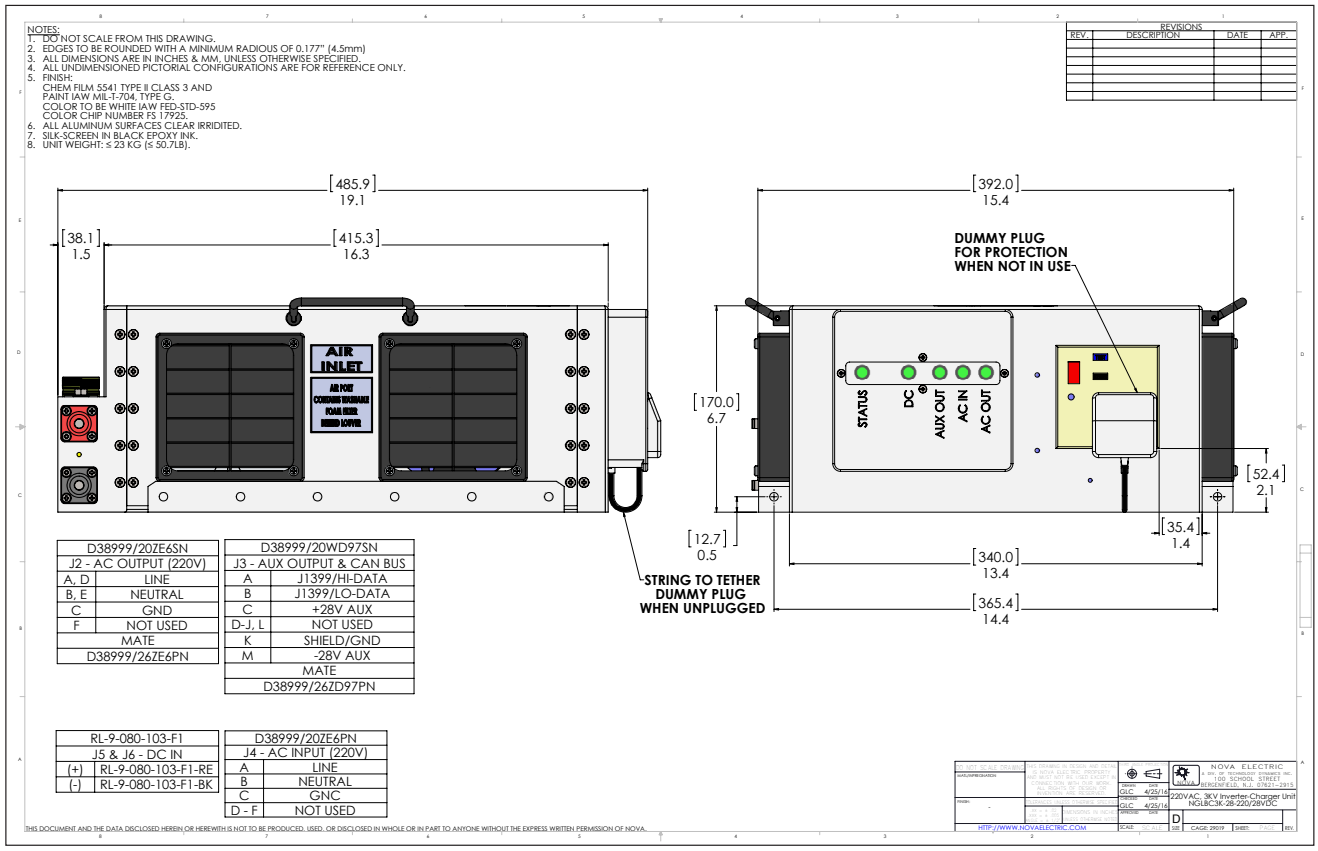
NGLBC3K-24-120/24VDC OUTLINE DRAWINGS







NGLBC3K-28-220/28VDC OUTLINE DRAWINGS

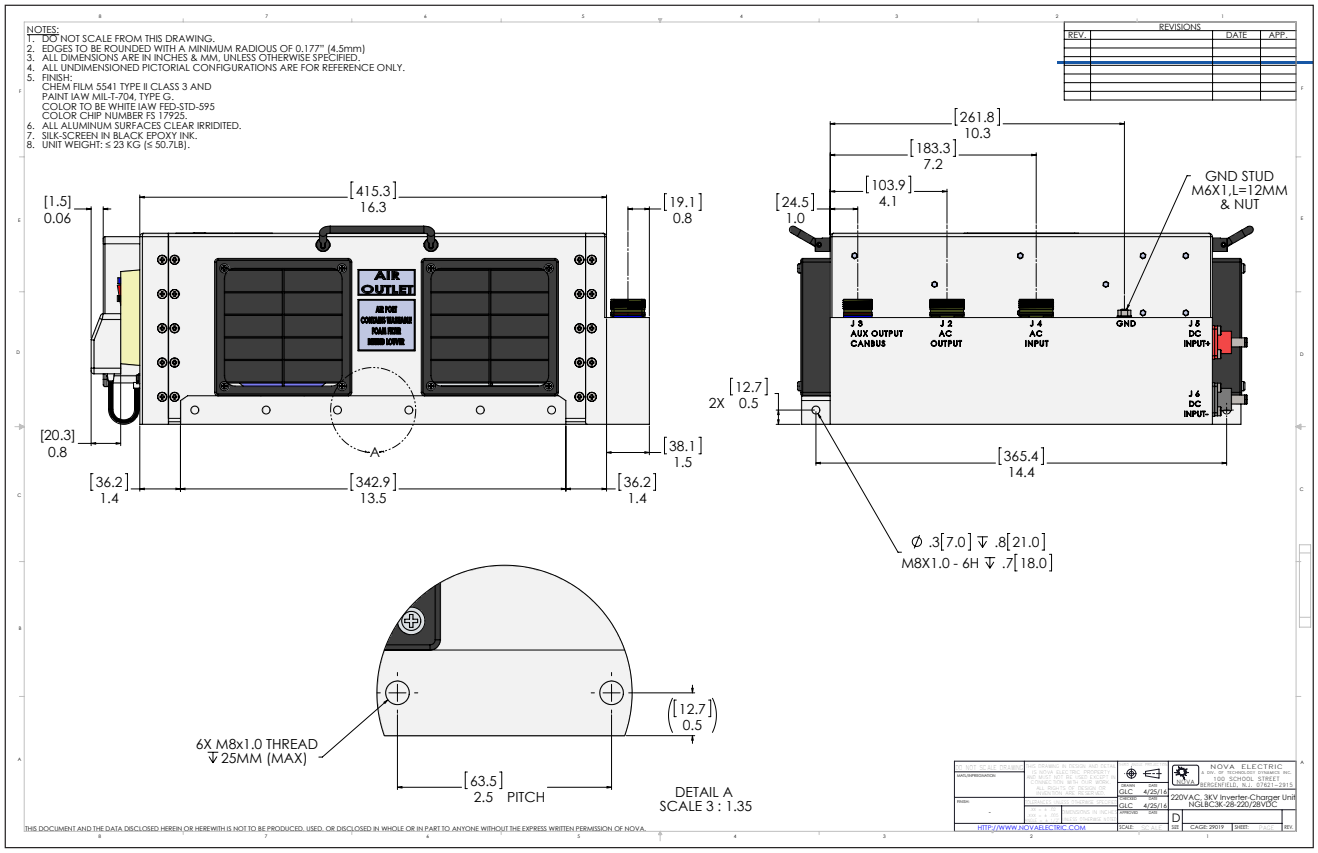


D38999/20ZE6SN	
J2 - AC OUTPUT (220V)	
A, D	LINE
B, E	NEUTRAL
C	GND
F	NOT USED
MATE	
D38999/26ZE6PN	

D38999/20WD97SN	
J3 - AUX OUTPUT & CAN BUS	
A	J1399/HI-DATA
B	J1399/LO-DATA
C	+28V AUX
D-J, L	NOT USED
K	SHIELD/GND
M	-28V AUX
MATE	
D38999/26ZD97PN	

RL-9-080-103-F1	
J5 & J6 - DC IN	
(+)	RL-9-080-103-F1-RE
(-)	RL-9-080-103-F1-BK

D38999/20ZE6PN	
J4 - AC INPUT (220V)	
A	LINE
B	NEUTRAL
C	GNC
D - F	NOT USED


NOTES:
1. DO NOT SCALE FROM THIS DRAWING.
2. EDGES TO BE ROUNDED WITH A MINIMUM RADIOUS OF 0.177" (4.5mm)
3. ALL DIMENSIONS ARE IN INCHES & MM, UNLESS OTHERWISE SPECIFIED.
4. ALL UNDIMENSIONED PICTORIAL CONFIGURATIONS ARE FOR REFERENCE ONLY.
5. 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 17925.
6. ALL ALUMINUM SURFACES CLEAR IRRIDITED.
7. SILK-SCREEN IN BLACK EPOXY INK.
8. UNIT WEIGHT: ≤ 23 KG (≤ 50.7LB).
REVISIONS
REV.
DATE
APP.
[415.3] 16.3
[1.5] 0.06
[19.1] 0.8
[20.3] 0.8
[38.1] 1.5
[36.2] 1.4
[342.9] 13.5
[36.2] 1.4
AIR OUTLET
[261.8] 10.3
[183.3] 7.2
[103.9] 4.1
[24.5] 1.0
GND STUD M6X1,L=12MM & NUT
J 3 AUX OUTPUT CANBUS
J 2 AC OUTPUT
J 4 AC INPUT
GND
J 5 DC INPUT+
J 6 DC INPUT-
[12.7] 0.5
2X
[365.4] 14.4
Ø .3[7.0] ↧ .8[21.0]
M8X1.0 - 6H ↧ .7[18.0]
6X M8x1.0 THREAD ↧ 25MM (MAX)
[12.7] 0.5
[63.5] 2.5 PITCH
DETAIL A
SCALE 3 : 1.35
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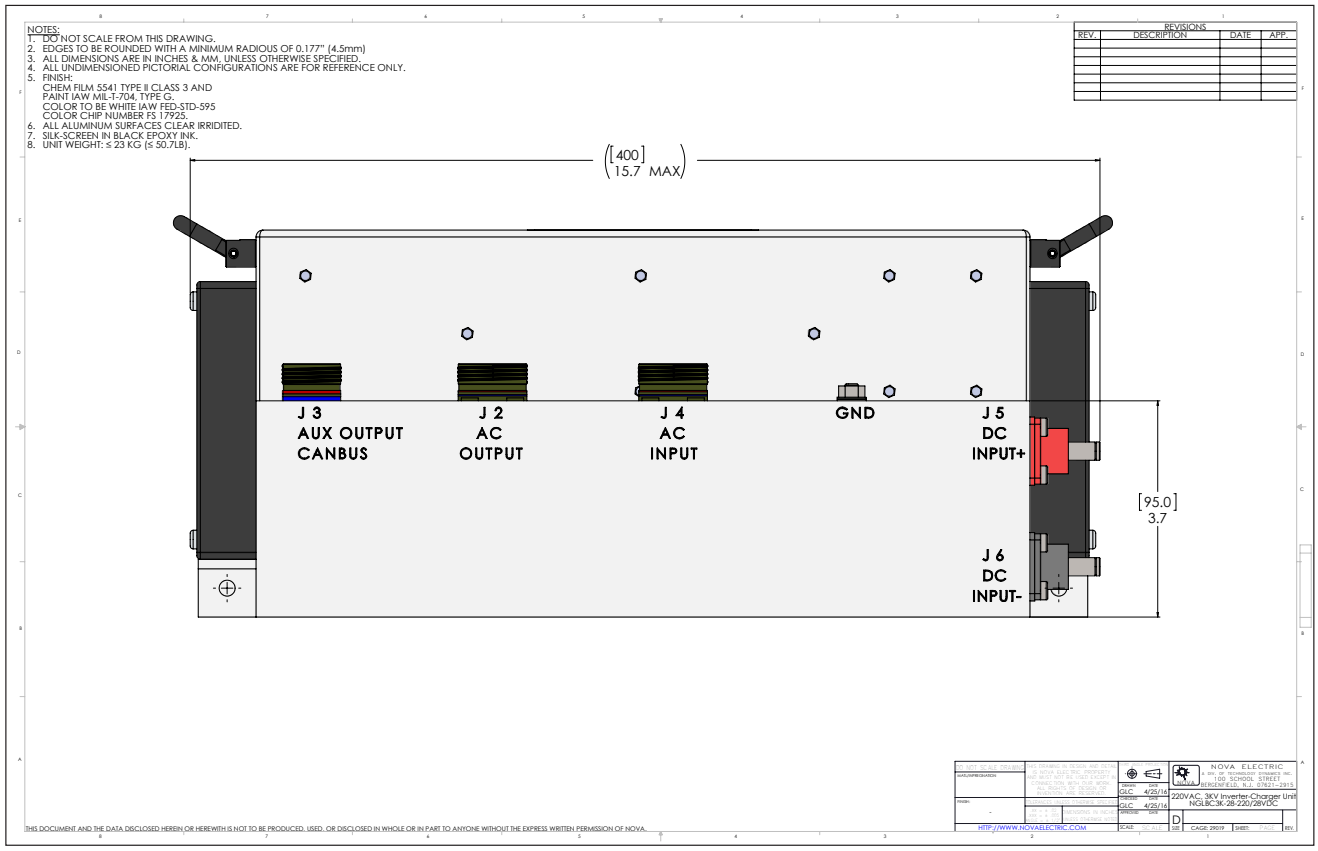
NOVA ELECTRIC
100 SCHOOL STREET
BERGENFIELD, N.J. 07621-2915
220VAC, 3KV Inverter-Charger Unit
NCLBC-3K-28-220/28VDC
HTTP://WWW.NOVAELECTRIC.COM
CAGE: 29019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DESCRIPTION
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APP.
[400] 15.7 MAX
J 3 AUX OUTPUT CANBUS
J 2 AC OUTPUT
J 4 AC INPUT
GND
J 5 DC INPUT+
J 6 DC INPUT-
[95.0] 3.7
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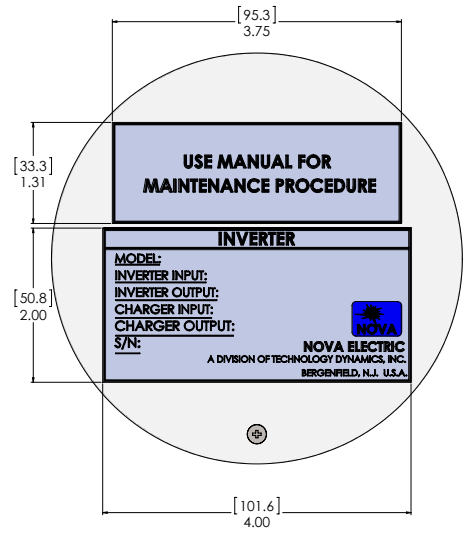
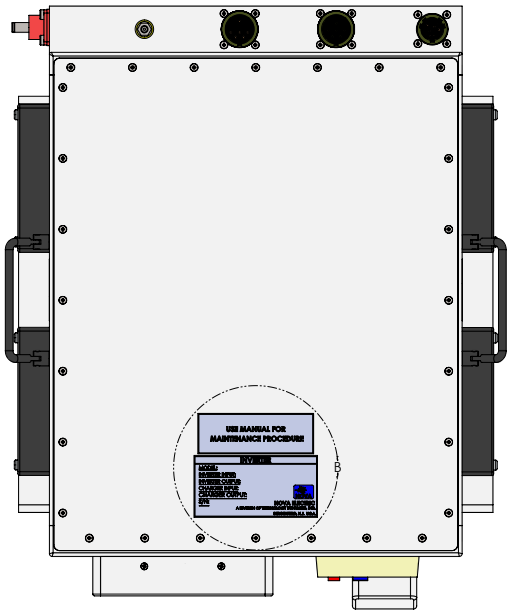


DETAIL B
SCALE 2 : 1



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A DIV. OF TECHNOLOGY DYNAMICS INC
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SIZE D CAGE: 29019 SHEET: REV.
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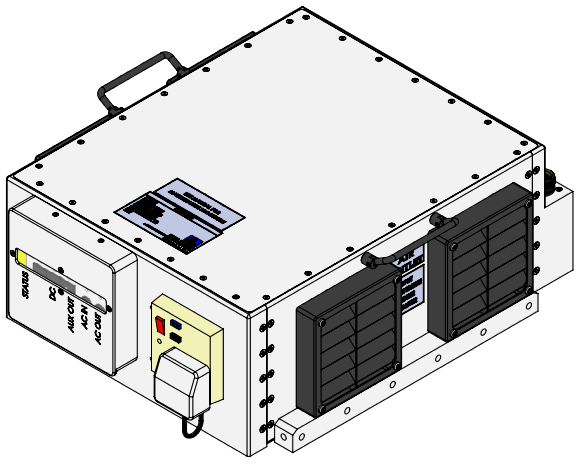

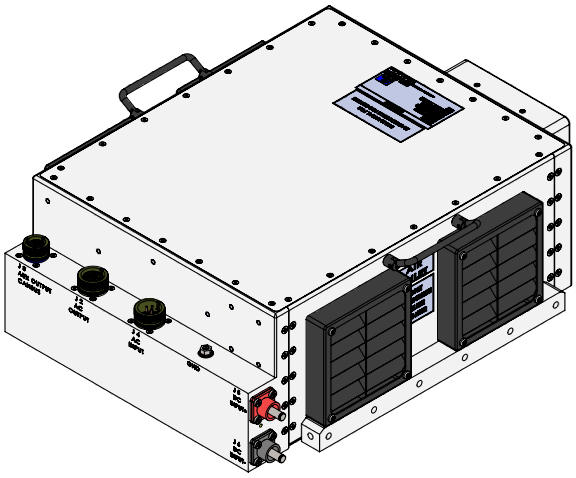

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