

ULTRA-LIGHTWEIGHT RUGGED GALAXY™ SERIES UPS

ISO 9001:2008



MIL-SPEC COMPLIANT

1 - 5 KVA

1 - 5U



**UNIVERSAL 120/240VAC PFC INPUT
SNMP COMMUNICATIONS
WHEN EVERY POUND COUNTS!**

APPLICATIONS

Shelters
Tactical Systems
Shipboard Power
Aircraft
HMMWVs
Mobile Systems
Ground Support
Transit Cases

COMPLIANCE

MIL-STD-810
MIL-S-901
MIL-STD-167
MIL-STD-461
MIL-STD-1399
MIL-STD-740
DOD-STD-1399

NOVA ELECTRIC
www.novaelectric.com

A Leader in UPS Technology Since 1966
500VA to 500+KVA

ADDRESS: 100 School St., Bergenfield NJ 07621
EMAIL: novasales@theallpower.com
PHONE: (201) 385-0500 FAX: (201) 385-0702

MADE IN USA

Uninterruptible Power Supply for Naval • Ground • Airborne Applications

COMPACT CHASSIS (1U - 5U TALL)

ULTRA LIGHTWEIGHT DESIGN

POWER FACTOR CORRECTED UNIVERSAL INPUT

SNMP COMMUNICATIONS

LITHIUM IRON PHOSPHATE BATTERIES AVAILABLE

WHEN EVERY POUND COUNTS!

Nova's Ultra Lightweight Galaxy-Series UPS Systems are high-reliability power sources specifically designed for demanding applications in high shock, vibration, humidity, and EMI environments in compliance to MIL-STD-1399, MIL-STD-461, MIL-S-901, MIL-STD-167, MIL-STD-810, MIL-STD-740, and DOD-STD-1399.

These models utilize True On-Line technology, offering maximum field-proven reliability for severe environment and high reliability applications such as:

- *Military Applications:
Including HMMWV, UAV, Shipboard, Submarine, Aircraft,
Mobile Power Units, Shelters, Transportable Systems,
Tactical Systems, Ground Support, and more.*
- *Heavy-Duty Industrial Applications*
- *Demanding Commercial Applications*
- *Communications Systems*



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PROTECTIVE FEATURES

AC & DC Input Circuit Breakers, Low Battery Shut Off with Circuit Breaker Trip-off, Overload & Thermal Protected, Input Under/Overvoltage Protected, Audible Alarm with Silence Switch.

ENVIRONMENTAL

UPS Operating Temp.: -20° to +55°C
(Extended ranges optional)
UPS Storage temperature range: -40° to +71°C
(Electronics Only - Extended ranges optional)
Humidity: to 95% RH non-condensing
All boards conformal coated with Acrylic MIL-I-46058 Type R.
Elevation: 15,000 Ft. (4,572 m) operating;
40,000 ft. (12,192 m) non-operating (Higher Optional)
Shock: 20 g, 11 mS half sinewave
Audible Noise: Less than 55 dbA at 5 ft.

MTBF: 100,000+ hours per field data @ +25C Ambient
Ground-Fixed
MTTR: 30 minutes by qualified personnel

COMMUNICATIONS

SNMP V1.0 standard via CAT-5 Connector (V3.0 Optional)
RS 232 (Available-Optional) Via DB 9 Connector
Alarm Contacts (Available-Optional)
Major Alarm: Logic Fault, Low Battery, OT, UPS Overloaded.
Minor Alarm: Utility Off, Load on Utility (with optional transfer switch)

INDICATORS

Status (Red / Green)
UPS Off (Red)
Logic Fault (Red)
Low Battery (Red)
Over Temperature (Red)
Load on Utility (Red) with optional transfer switch

AUDIBLE

Audible alarm with silence switch



Uninterruptible Power Supply for Naval • Ground • Airborne Applications

AVAILABLE OPTIONS INCLUDE

- Power distribution units
- Ruggedization against high shock, vibration and humidity
- MS connector mates and multiple output outlets
- Chassis Slide Guides
- Internal transfer switch (static or electromechanical)
- Custom Enclosures
- Additional run time via external batteries
- 3Ø Power Input
- Premium Wide-Temp Range VRLA batteries with up to 12 year life
- 400 Hz input and / or output
- “LiFe” models feature internal Lithium Iron Phosphate batteries with embedded Battery Management System for substantial weight savings and longer run time.
- CAD Free Connectors
- Non-PVC wiring
- 28 VDC Input
- High IP Protection for front / rear panels
- AUX DC Outputs
- RTCA/DO-160G Compliant Aircraft Grade Package



Typical IP32 Protection Package

SPECIFICATIONS

ELECTRICAL

Input Voltage: 120/240 VAC (110 - 250 VAC)
PFC (3Ø input optional)
Output Voltage: 120, 208, or 230 VAC (specify)
Frequency: 50 / 60 / 400 Hz. Available
Voltage Regulation: $\pm 2\%$ NL to FL
Frequency Regulation: $\pm 0.5\%$ NL to FL
Harmonic Distortion: 5% THD, 3% typical
Input Power Factor: 0.95 or Better @ half-full load
Efficiency at full load: 80-85% @ full load typical
(batteries charged)
Connections: MS Connector (mates optional)

NOMINAL DIMENSIONS:

UPS Dimensions:
19" Wide x 24" Deep (See chart for height)

Note: External batteries available on all models if increased run time is required – up to 24 hours.

External battery drawer typically 3-4U depending on requirements

BATTERIES:

Internal on all but 5KVA EXT models

- Standard sealed, maintenance free lead acid batteries have -20 to +50C storage range.
- Optional Premium sealed, maintenance free lead acid batteries have -40 to +80C operating range and useful life of 8-12 years @ +25C ambient.
- Optional Lithium Iron Phosphate batteries (as shown in units with “LiFe” model suffix) have -20 to +60C operating range and useful life of 8-10 years @ +25C ambient, but are much lighter than lead acid batteries and offer about twice the battery run time in the same volume battery pack.

Uninterruptible Power Supply for Naval • Ground • Airborne Applications

120 VAC OUTPUT MODELS (400 Hz Input and/or Output optional on all models)

MODEL	KVA	KW	NOMINAL INPUT	INPUT AMPS	UPS LBS.	RUNTIME	HEIGHT
GRSLPFC11-5K60-120/240A-120-5M-5U	5	4	120-240VAC	52/26A	110	4 min @ 3 kw	5U
GRSLPFC11-5K60-120/240A-120-5M-5U-LIFE	5	4	120-240VAC	52/26A	75	4 min @ 3 kw	5U
GRSLPFC11-5K60-120/240A-120-4U	5	4	120-240VAC	52/26A	45	EXTERNAL	4U
GRSLPFC11-3K60-120/240A-120-5M-4U	3	3	120-240VAC	30/15A	95	5 min.	4U
GRSLPFC11-3K60-120/240A-120-5M-4U-LIFE	3	3	120-240VAC	30/15A	70	5 min.	4U
GRSLPFC11-3K60-120/240A-120-10M-4U	3	2.4	120-240VAC	24/12A	95	7 min.	4U
GRSLPFC11-3K60-120/240A-120-5M-3U	3	2.4	120-240VAC	24/12A	80	5 min.	3U
GRSLPFC11-3K60-120/240A-120-5M-3U-LIFE	3	2.4	120-240VAC	24/12A	65	5 min.	3U
GRSLPFC11-2K60-120/240-120-5M-3U	2	1.6	120-240VAC	16/8A	80	7 min.	3U
GRSLPFC11-2K60-120/240-120-5M-3U-LIFE	2	1.6	120-240VAC	16/8A	65	7 min.	3U
GRSLPFC11-1.5K60-120/240A -120-5M-2U	1.5	1.2	120-240VAC	12/6A	60	5 min.	2U
GRSLPFC11-1.5K60-120/240A -120-10M-2U-LIFE	1.5	1.2	120-240VAC	12/6A	37	10 min.	2U
GRSLPFC11-1K60-120/240A-120-10M-1U-LIFE	0.9	0.7	120-240VAC	8/4A	25	10 min.	1U

230 VAC OUTPUT MODELS (400 Hz Input and/or Output optional on all models)

MODEL	KVA	KW	NOMINAL INPUT	INPUT AMPS	UPS LBS.	RUNTIME	HEIGHT
GRSLPFC11-5K50-120/240A-230-5M-5U	5	4	120-240VAC	52/26A	110	4 min @ 3 kw	5U
GRSLPFC11-5K60-120/240A-230-5M-5U-LIFE	5	4	120-240VAC	52/26A	75	4 min @ 3 kw	5U
GRSLPFC11-5K50-120/240A-230-5M-4U	5	4	120-240VAC	52/26A	45	EXTERNAL	4U
GRSLPFC11-3K50-120/240A-230-5M-4U	3	3	120-240VAC	30/15A	95	5 min.	4U
GRSLPFC11-3K60-120/240A-230-5M-4U-LIFE	3	3	120-240VAC	30/15A	70	5 min.	4U
GRSLPFC11-3K50-120/240A -230-10M-4U	3	2.4	120-240VAC	24/12A	95	7 min.	4U
GRSLPFC11-3K50-120/240A -230-5M-3U	3	2.4	120-240VAC	24/12A	80	5 min.	3U
GRSLPFC11-3K60-120/240A-230-5M-3U-LIFE	3	2.4	120-240VAC	24/12A	65	5 min.	3U
GRSLPFC11-2K50-120/240A -230-5M-3U	2	1.6	120-240VAC	16/8A	80	7 min.	3U
GRSLPFC11-2K50-120/240A -230-5M-3U-LIFE	2	1.6	120-240VAC	16/8A	65	7 min.	3U
GRSLPFC11-1.5K50-120/240A -230-5M-2U	1.5	1.2	120-240VAC	12/6A	60	5 min.	2U
GRSLPFC11-1.5K50-120/240A -230-10M-2U-LIFE	1.5	1.2	120-240VAC	12/6A	37	10 min.	2U
GRSLPFC11-1K50-120/240A -230-5M-1U-LIFE	0.9	0.7	120-240VAC	8/4A	25	10 min.	1U

THREE-PHASE INPUT MODELS (400 Hz Input and/or Output optional on all models)

MODEL	KVA	KW	NOMINAL INPUT	INPUT AMPS	UPS LBS.	RUN TIME	HEIGHT
GRSLPFC11-5K60-120/208-120-5M-5U	5	4	120/208VAC three-phase	15A	110	4 min @ 3 kw	5U
GRSLPFC11-5K60-120/208-5M-5U-LIFE	5	4	120/208VAC three-phase	15A	75	4 min @ 3 kw	5U
GRSLPFC11-3K60-120/208-120-5M-4U	3	3	120/208VAC three-phase	11A	95	5 min	4U
GRSLPFC11-3K60-120/208-120-5M-4U-LIFE	3	3	120/208VAC three-phase	9A	70	5 min	4U
GRSLPFC11-3K60-120/208 -120-10M-4U	3	2.4	120/208VAC three-phase	9A	95	7 min	4U
GRSLPFC11-3K60-120/208 -120-5M-3U	3	2.4	120/208VAC three-phase	9A	80	5 min	3U
GRSLPFC11-3K60-120/208 -120-5M-3U-LIFE	3	2.4	120/208VAC three-phase	9A	65	5 min	3U
GRSLPFC11-2K60-120/208 -120-5M-3U	2	1.6	120/208VAC three-phase	6A	80	7 min	3U
GRSLPFC11-2K60-120/208 -120-5M-3U-LIFE	2	1.6	120/208VAC three-phase	6A	65	7 min	3U
GRSLPFC11-1.5K60-120/208 -120-5M-2U	1.5	1.2	120/208VAC three-phase	5A	60	5 min	2U
GRSLPFC11-1.5K60-120/208 -120-5M-2U-LIFE	1.5	1.2	120/208VAC three-phase	5A	37	10 min	2U

Uninterruptible Power Supply for Naval • Ground • Airborne Applications

SYSTEM COMPLIANCE

MIL-STD-1399 Section 300B: For Type I apparatus
MIL-STD-740-1: Airborne Sound Measurements for Shipboard Equipment
MIL-STD-740-2: Structureborne Vibratory Acceleration Measurements

Additional Ruggedization to meet MIL-S-901, MIL-STD-167, MIL-STD-810, and DOD-STD-1399: The UPS System's construction is extremely robust, and ruggedized throughout. All components and modules within the unit are mounted using additional steel brackets and heavy-duty stainless-steel hardware, which is then further secured using Loctite and RTV where required. All boards are conformal-coated (Acrylic MIL-I-46058 Type R) for maximum resistance to potential condensation and fungus growth. The unit was tested and qualified as follows:

MIL-S-901D for Grade A, Class II, Type B Equipment (mounted in shock-isolated rack attenuating to 20g/11ms max)
MIL-STD-167-1 for Type I Equipment

MIL-STD-810

- Air Temperature per MIL-STD-810F Method 502.4, Procedure II
- Steady State Temperature per MIL-STD-810F, Method 501.4, Procedure I (Constant Temperature) and Method 502.4, Procedure I
- Temperature Shock per MIL-STD-810F, Method 503.4, Procedure II, Cyclic.
- Thermal Shock testing per MIL-STD-810G, Method 503.5, Procedure I-D
- Operating Temperature Shock per MIL-STD-810B Method 503.0 to 71°C
- High Temperature Storage per MIL-STD-810G, Method 501.5, Procedure I
- Low Temperature Storage testing per MIL-STD-810G, Method 502.5, Procedure I
- High Temperature Operating per MIL-STD-810G, Method 501.5, Procedure II
- Low Temperature Operating per MIL-STD-810G, Method 502.5, Procedure II
- Operational Humidity per MIL-STD-810F Method 507.4.
- Humidity per MIL-STD-801G, Method 507.5, Procedure I
- Storage and Transportation Humidity per MIL-STD-810F, Method 507.4
- Salt Fog Atmosphere per MIL-STD-810F Method 509.4
- Altitude per MIL-STD-810F, Method 500.4, Procedure I, Storage/Air Transport.
- Operating and Non-Operating Altitude Testing per MIL-STD-810G, Method 500.5, Procedure II
- Rapid Decompression per MIL-STD-810F, Method 500.4, Procedure III
- Transit Shock per MIL-STD-810F, Method 516, Procedures IV, V and VI
- Transportation Vibration per MIL-STD-810F, Method 514.5, Procedure II for loose cargo transportation
- Transportation Vibration per MIL-STD-810G, Method 514.6, Procedure I, Category 20
- Vibration per MIL-STD-810B Method 514.6, Category 12, Procedure I
- Transit Drop per MIL-STD-810F, Method 516.5, Procedure IV
- Transit Drop per MIL-STD-810G, Method 516.6, Procedure IV
- Bench Handling per MIL-STD-810F, Method 516.5, Procedure VI
- Bench Handling per MIL-STD-810G, Method 516.6, Procedure VI

DOD-STD-1399 Section 301A Table V – Design Limits for Ship Motion

Internal EMI Reduction Package to meet MIL-STD-461: The design of this unit is specifically focused on reducing EMI emissions. The UPS contains substantial internal filtering to minimize EMI emissions. Inputs which may be susceptible to transients are protected by several methods. The compact rack mount chassis is specifically treated with low surface resistivity finishes on the interior. All aluminum parts are treated with clear irridite. The steel parts are treated with zinc plate, followed by a clear chromate. Paint method via ANSI-61 gray is designed to assure excellent bonding of mating sheet metal parts. All input and output ventilation filters include metal honeycomb-style or mesh filters. The unit was tested and qualified as follows:

MIL-STD-461E: CE101, CE102, CS101, CS114, CS116, RE102, RS101, and RS103

OPTIONAL COMPLIANCE WITH RTCA/DO-160G AIRCRAFT GRADE PACKAGE

Qualifications to RTCA/DO-160G include:

- * Rapid Decompression: Section 4 Cabin Pressure (8K) to Max Oper Alt (35K) in 15 sec; Hold for 10 min
- * Crash Safety Sustained: Section 7, Cat B - Up = 3.0g - Down = 6.0g - Fwd = 9.0g - Aft = 1.5g - Side = 4.0g
- * Explosive Atmosphere: Non-Ignition Test Sec. 9.6.2, Cat E

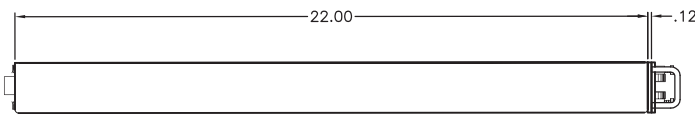
Qualifications to MIL-STD-810B include:

- * Operating Temperature Shock per MIL-STD-810B Method 503.0 to 71°C
- * Vibration per MIL-STD-810B Method 514.6, Category 12, Procedure I

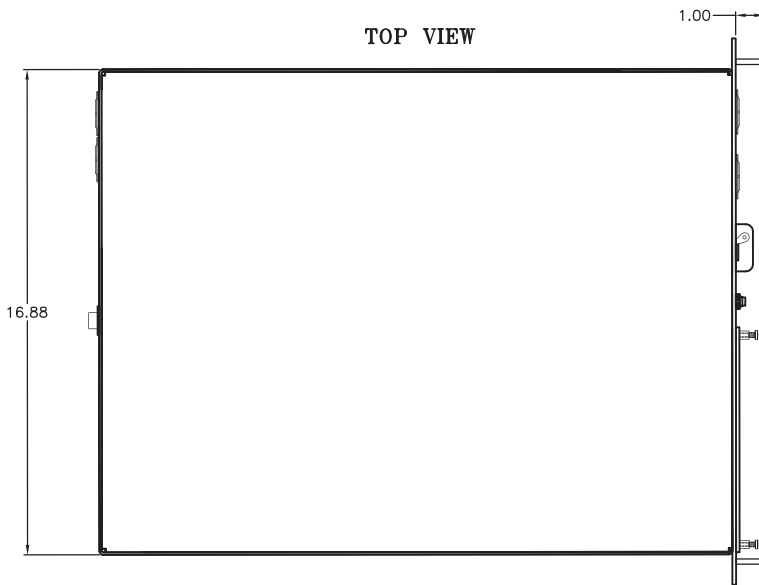
Note: Qualification testing was performed with optional premium batteries required to meet temperature testing requirements.

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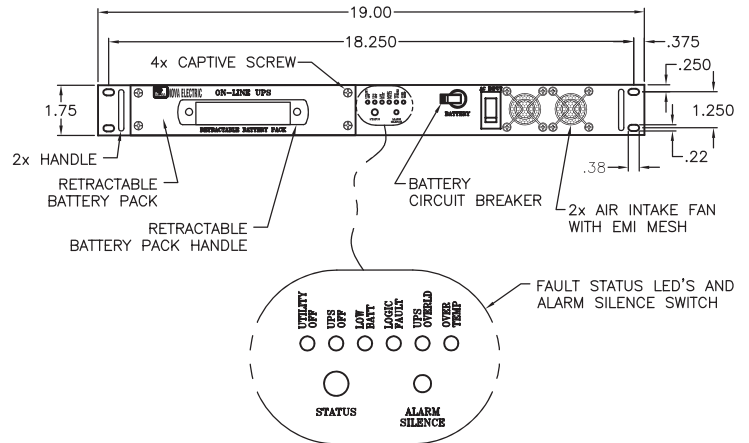
LEFT SIDE VIEW



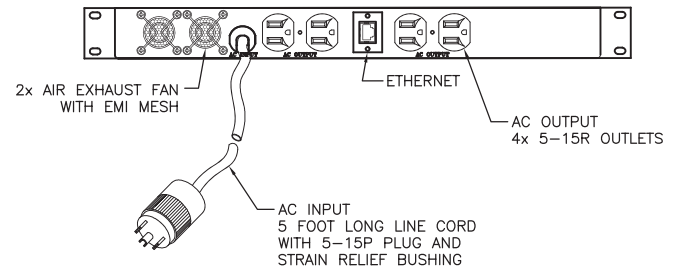
TOP VIEW



FRONT VIEW



REAR VIEW

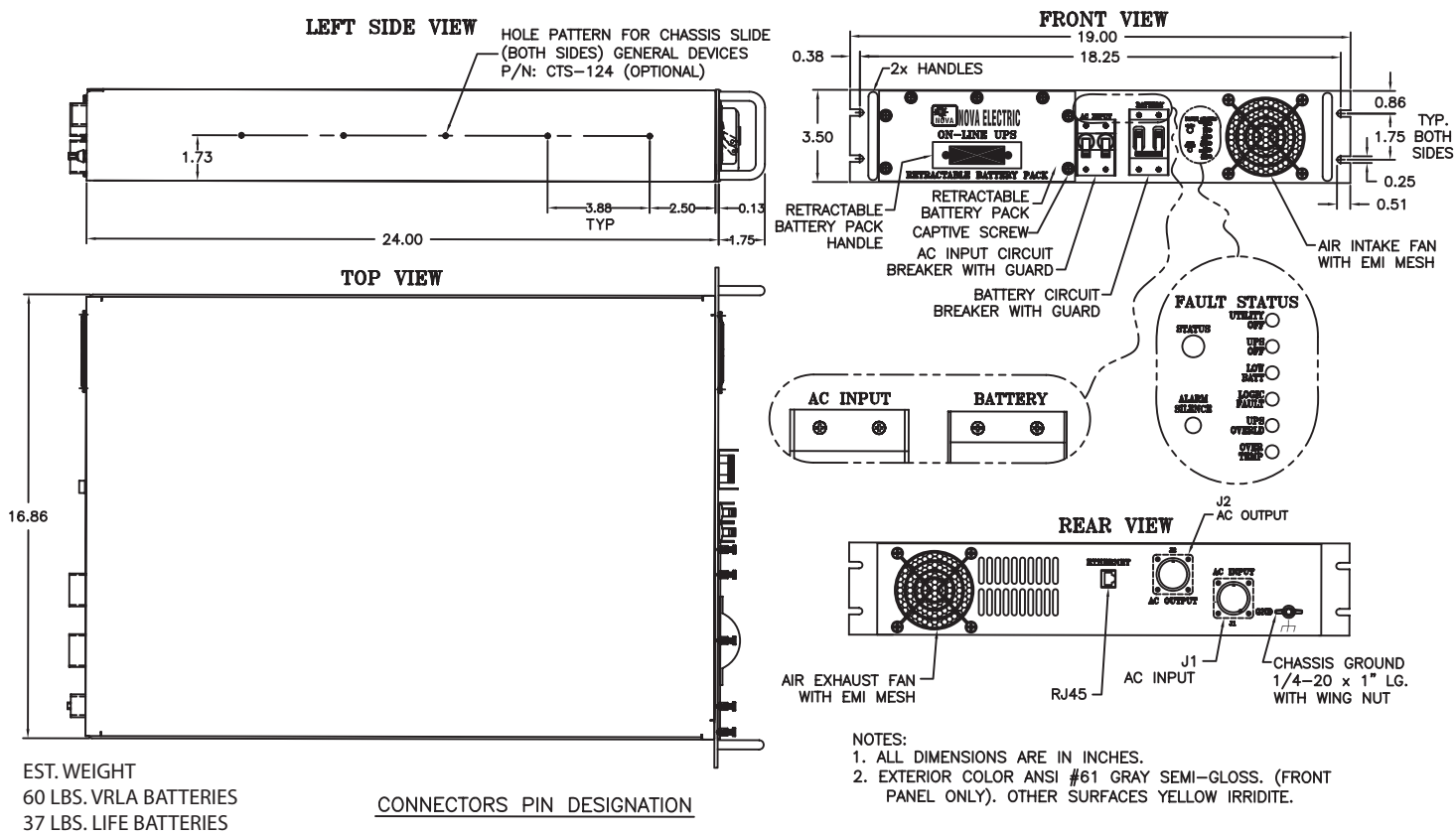


TYPICAL 1U CHASSIS

Notes:

1. MS Connectors with mates optional
2. Chassis slides optional

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- NOTES:
1. ALL DIMENSIONS ARE IN INCHES.
 2. EXTERIOR COLOR ANSI #61 GRAY SEMI-GLOSS. (FRONT PANEL ONLY). OTHER SURFACES YELLOW IRRIDITE.

J1 AC INPUT

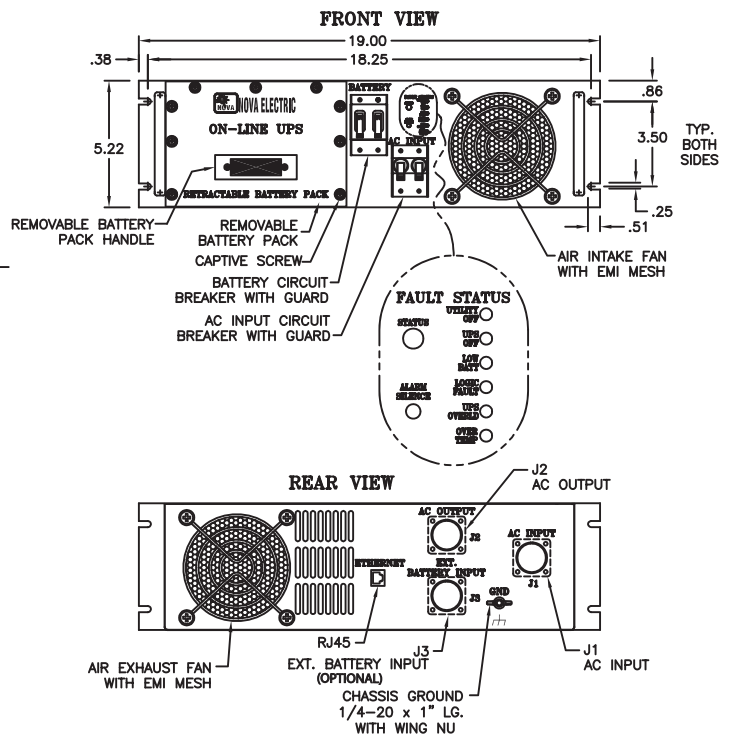
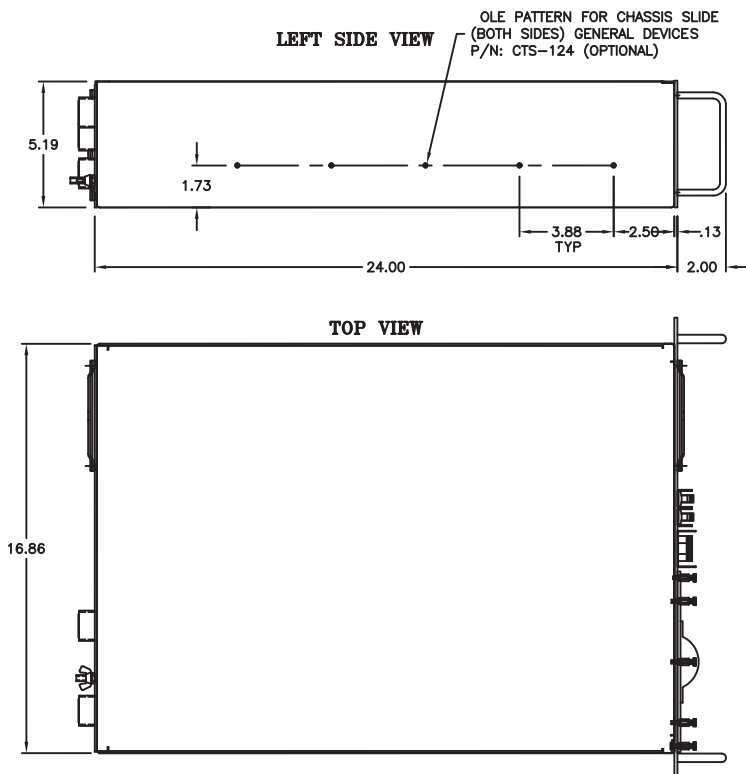
PIN	DESCRIPTION
A	LINE
B	NEUTRAL
C	GND

J2 AC OUTPUT

PIN	DESCRIPTION
A	LINE
B	NEUTRAL
C	GND

TYPICAL 2U CHASSIS

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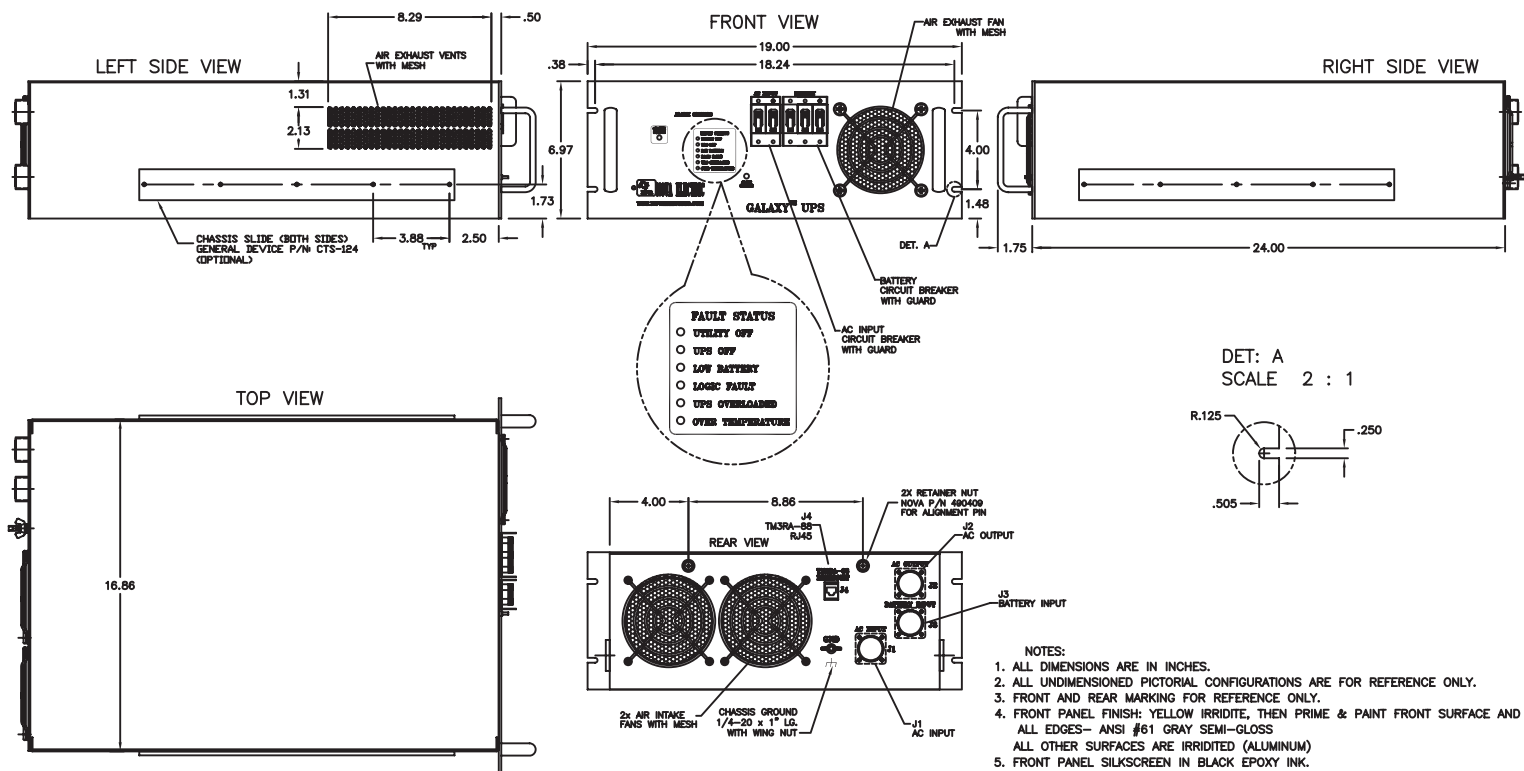
NOTES:
1. ALL DIMENSIONS ARE IN INCHES.
2. EXTERIOR COLOR ANSI #61 GRAY SEMI-GLOSS. (FRONT PANEL ONLY). OTHER SURFACES YELLOW IRRIDITE.

CONNECTORS PIN DESIGNATION

J1 AC INPUT		J2 AC OUTPUT		J3 EXT. BATTERY INPUT	
MS3102R20-19P		MS3102R20-19S		MS3102R20-24P	
PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION
A	LINE	A	LINE	A	GND
B	NEUTRAL	B	NEUTRAL	B	DC +
C	GND	C	GND	C	SPARE
				D	DC -

TYPICAL 3U CHASSIS

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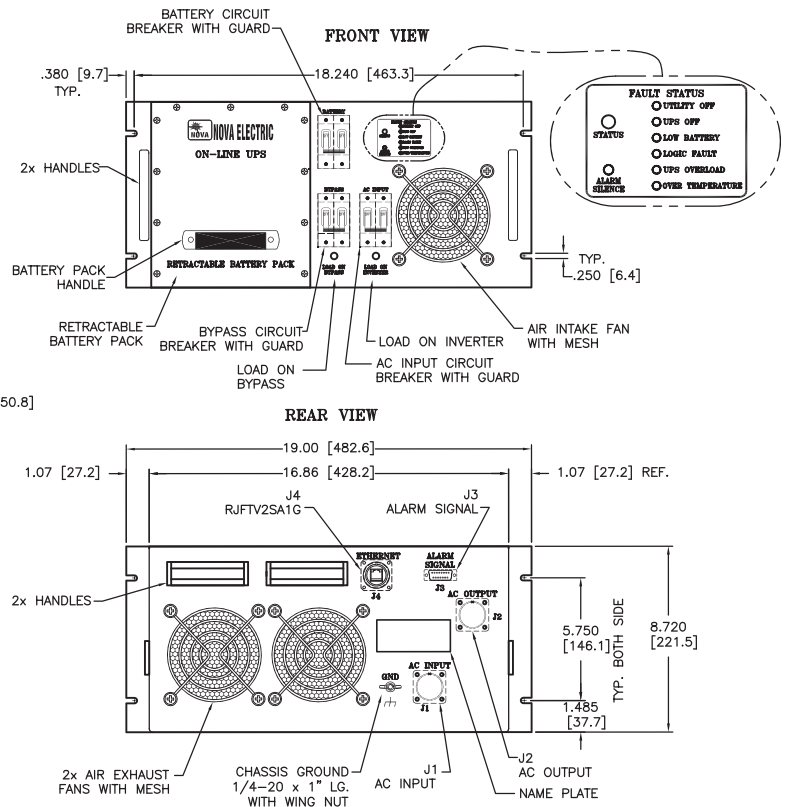
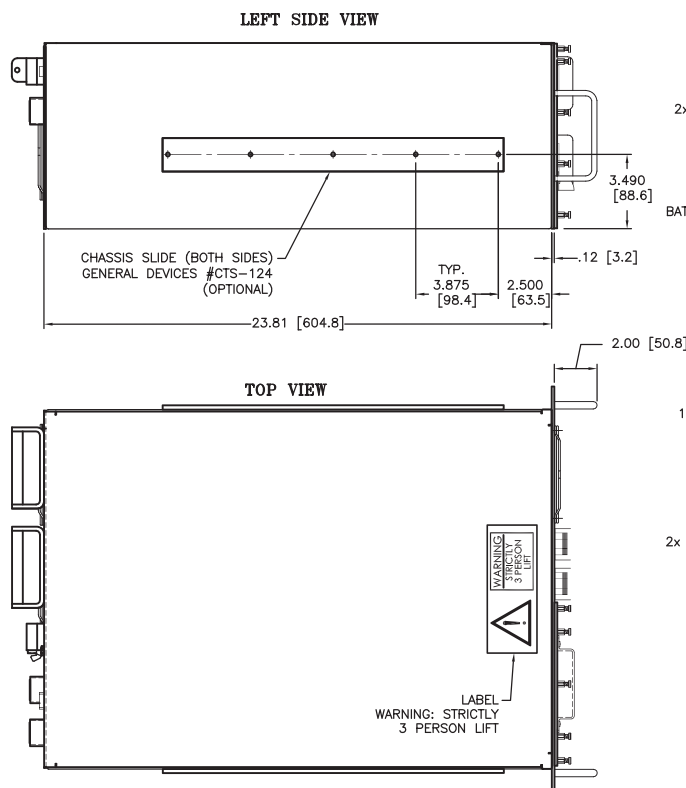


CONNECTORS PIN DESIGNATION

J1 AC INPUT		J2 AC OUTPUT		J3 BATTERY INPUT	
MS3102R20-19P		MS3102R20-19S		MS3102R20-24P	
PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION
A	LINE	A	LINE	A	GND
B	NEUTRAL	B	NEUTRAL	B	DC +
C	GND	C	GND	C	SPARE
				D	DC -

TYPICAL 4U CHASSIS

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- NOTES:
1. ALL DIMENSIONS ARE IN INCHES [MM].
 2. ALL UNDIMENSIONED PICTORIAL CONFIGURATIONS ARE FOR REFERENCE ONLY.
 3. FRONT AND REAR MARKING FOR REFERENCE ONLY.
 4. FRONT PANEL FINISH: YELLOW IRRIDITE, THEN PRIME & PAINT FRONT SURFACE AND ALL EDGES - ANSI #61 GRAY SEMI-GLOSS. ALL OTHER SURFACES ARE IRRIDITED (ALUMINUM).
 5. FRONT AND REAR PANEL SILKSCREEN IN BLACK EPOXY INK.
 6. CAD-FREE CONNECTORS OPTIONAL.

CONNECTORS PIN DESIGNATION

J1 AC INPUT		J2 AC OUTPUT	
MS3102R20-19P		MS3102R20-19S	
PIN	DESCRIPTION	PIN	DESCRIPTION
A	LINE	A	LINE
B	NEUTRAL	B	NEUTRAL
C	GND	C	GND

J3 ALARM SIGNAL	
DAM-15S	
PIN	DESCRIPTION
1 & 2	UTILITY PRESENT
3 & 4	TEMP SENSE
5 & 6	BATT LOW
7 & 8	OVERLOAD
9 & 10	NOT USED
11 & 12	NOT USED
13,14,15	NOT USED

J4 ETHERNET	
RJFTV2SA1N	
RJ45 WIRED IN ACCORDANCE WITH THE 100Base-TX Signal Pin Out	

TYPICAL 5U CHASSIS

RUGGED AC POWER SYSTEMS UPS, INVERTERS & CONVERTERS

DESIGNED TO MEET MIL-STD-810, MIL-STD-461, MIL-STD-1399 & MIL-S-901 OPTIONALLY
COMPATIBLE WITH GENERATOR INPUT



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

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

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