

NEWMAR[®]

*Powering The Network*SM



Land Mobile • Cellular • Broadband • Microwave

- Mobile DC UPS
- Battery Chargers
- DC Converters
- Power Supplies

- DC Power Systems
- Site Power Monitoring

- Rectifiers
- Distribution Panels
- Inverter-Chargers
- Batteries & Accessories



DC Power Plant Engineering

NEWMAR manufactures a broad range of high quality power products for communication applications and has earned a reputation for producing high reliability DC components and systems for powering the wireless network. In addition, NEWMAR's engineering team offers comprehensive system integration services. These include consultation, engineering, manufacturing, assembly, test, and delivery of fully integrated and functional power plants, precisely tailored to meet individual customer requirements.

Project Consultation

The process begins with a comprehensive analysis of your project's power requirements, offering comprehensive solutions based on all relevant factors, including:

- Load requirements and tolerances
- Site AC power considerations
- Colocation compatibility
- Fault tolerance/redundancy
- Hot swap and hot standby configuration
- Back-up battery run time calculation
- Power distribution requirements
- Remote monitoring and alarming

Engineering and Design

A comprehensive project proposal with a detailed diagram of the proposed custom power system is submitted to you for approval.

Rack Assembly

All necessary components are installed and wired in racks or cabinets according to the particular site requirements. These components are typically manufactured and stocked by NEWMAR, thus assuring high reliability and short lead times for system delivery.

Testing

Each rack component undergoes rigorous "burn-in" testing individually, then the assembled rack system is again fully tested under simulated site load and function conditions to ensure maximum reliability.

Documentation

Custom user manuals are provided with each system, consisting of detailed operation and troubleshooting instructions for each system component, complete schematic diagrams, and a wiring interconnect illustration of the system as a whole.

Shipment

Each rack system is rigidly secured to a custom-built shipping skid and trucked directly to your installation site.

Aftersale Support

A duplicate system file, including detailed photos of the assembled power plant, is maintained at the factory in order to provide ongoing technical support of the system, as needed.



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Relay Racks

Power Systems by NEWMAR are currently in service at numerous telecom and other communication sites serving public safety, microwave, cellular, transportation links and remote repeaters. System and project references are available upon request.



Powering the Network

Unity Rectifier System

The Unity Rectifier System comprises a low profile 1.75" (1 RU) shelf which accommodates up to three 150 watt, -48 or +24 volt hot-swap rectifiers, plus an optional GMT fuse distribution panel. The system is scalable/adaptable for N, N+1 or N+2 configurations. Form C status contacts enable remote alarms for the rectifiers and fuse distribution circuits. Front panel OK/FAIL LED's allow monitoring status of each rectifier individually.



Unity Rectifier System

Shelf	Input	Capacity	Size	Weight
URS	115/230 VAC Nom.	3 Unity Rectifiers (-48 or +24 V), 1 GMT fuse panel	19/23" Rackmount, 1 RU	6.7 lbs.

Rectifier	Input Amps @ Full Load 115/230V	Output Voltage	Output Amps Cont.	Watts	Size	Weight
UR48-3	2.2/1.1	-54.4 VDC, adjustable 42-56 VDC	3	150	1 RU	1.9 lbs.
UR24-6	2.2/1.1	+27.2 VDC, adjustable 21-28 VDC	6	150	1 RU	1.9 lbs.

GMT Panel	Nominal Input/Output	Total Fuse Capacity	Total Current Capacity	Size	Weight
UFP-5	-48 or +24 VDC	5	20A	1 RU	1 lbs.

Unity Stand-Alone Rectifier

Rectifier	Input Amps @ Full Load 115/230V	Output Voltage	Amps Cont. Output	Watts	Weight
USAR48-3	2.2/1.1	-54.4 VDC, adjustable 42-56 VDC	3	150	2.8 lbs.
USAR24-6	2.2/1.1	+27.2 VDC, adjustable 21-28 VDC	6	150	2.8 lbs.

Features

- 150 watt rectifier units - 48 or 24 volt, slide and lock into the Unity Shelf
- Shelf accommodates up to three rectifiers—450 watts total—plus an optional five-position GMT fuse panel
- Scalable/adaptable hot swap configuration: N, N+1, N+2
- Front panel status indicators, output voltage test points and adjustment potentiometers
- Individual or summary rectifier alarm contacts; Form C
- Summary fuse panel alarm contacts; Form C
- 115/230 VAC shelf/rectifier input
- GMT fuse panel: Five positions, easy rear panel wiring to loads, fuse access at front

Unity Rectifiers

Models: UR48-3, UR24-6

Input Voltage/Frequency/PF: 85-264 VAC* / 47-63 Hz. / .96-.98

Input Amperage: 2.2 amps @ 115V, 1.1 amps @ 230V

Output Voltage/Amperage*:

UR48-3: -54.4 VDC, adjustable 42-56 VDC, 3 amps continuous

UR24-6: +27.2 VDC, adjustable 21-28 VDC, 6 amps continuous

*100 % output power available from 105 to 264 VAC; Derate output linearly from 100% @ 105 VAC to 80% @ 85 VAC

Efficiency: 83% per rectifier

Regulation/Ripple: +/-2% / UR24-6: 150 mV, UR48-3: 230 mV

Protection: Over-voltage, current limiting, over-temp, forced air cooling

Alarms/Indicators: Output failure contacts; Form C

Front panel LED indications: "DC OK/DC FAIL"

Front panel voltage test points and adjustment

Operating Temperature: -10°C to +60°C; 100 % load to +50°C; Derate linearly to 80% load @ 60°C

Design Standards: EN55022 Class B, EN61000-4-2,3,4,5,6,8,11, EN61000-3-2,3, UL 1950

Approvals: UL Recognized 60950

Unity Rectifier Shelf

Model: URS

Input: 115/230 VAC nominal

Capacity: Up to Three Unity Rectifiers, -48 or +24 volt and one GMT Fuse Panel (UFP-5)

Mounting: 19" or 23" rack; center or flush mount

Unity Fuse Distribution Panel

Model: UFP-5

Voltage: -48 VDC or +24 VDC nominal (selectable by jumper)

Current: 20 amps max. total

Capacity: Five GMT fuses, 10 amps max. per individual fuse

Available Amperages: 1, 3, 5, 7.5, 10, 15 Amps

Alarms/Indicators:

Output failure summary alarm contacts; Form C

Front panel blown fuse summary LED indicator

Unity Stand-Alone Rectifier

For applications that do not require rack-mounting or redundancy, the Unity is available as a stand-alone rectifier. A versatile flange permits a myriad of mounting options, such as on the side of rack rails, inside cabinets, on walls or under shelves, maximizing use of restricted spaces.

The unit comes with a 6' power cord and a rear-mounted terminal block for easy wiring. Performance specifications are identical to single Unity Rectifiers detailed on this page.



Models: USAR48-3 and USAR24-6



Powering the Network

Power Modules

These Versatile Rectifier Modules function as either power supplies or battery chargers for 12, 24 or 48 volt systems; positive, negative or floating ground. They may be employed singly or in combination, enabling the installer to scale the system anywhere from 500 to 10,000 watts per rack. Units may be paralleled for N + 1 redundancy and alarm contacts allow local or remote monitoring. An optional DC quick connect wiring kit allows easy replacement of modules without system shutdown.



Power Modules may be used separately as a power source, or they may be integrated with the Power Function Manager (see opposite page) to greatly expand the system capability with other functions such as digital output monitoring, powering multiple loads via circuit breaker distribution and low voltage battery disconnect.

Features

- 12, 24 or 48 volts output; pos., neg. or floating ground
- 115 or 230 VAC, 50-60 Hz input 560 & 1000 watt models
- 230 VAC only 2200 watt model
- 560, 1000 or 2200 watts per module (approx.)
- Built-in oring diode for parallel or N + 1 configuration
- Power supply or battery charger operation (DC UPS system)
- Battery charging options: three-step charging, gel/lead-acid switch, equalization and temperature compensation
- Remote shutdown control option via TTL signal (except 2200 watt models)
- Form C alarm contacts
- 19" or 23", 2 RU, flush or 6" forward rackmount

Protection

- Output fuse for reverse polarity
- Current limit
- Input circuit breaker
- Automatic high temp. output power reduction
- Forced air cooling with filter provided

Mechanical/General

- Anodized aluminum front panel
- Vinyl laminated base and cover
- 19" or 23" Rackmount, brackets provided
- Wallmount via optional brackets
- IEC AC entry module. 6' power cord with NEMA 5-15 plug, 115 VAC. (560 watt models)
- 6' power cord with NEMA 6-15 plug, 230 VAC (1,000 watt models)
- 6' power cord with NEMA 5-20 plug, 115 VAC also supplied (1,000 watt models)
- Hardwire junction box on 2200 watt units, no power cord provided
- 1/4" -20 Output stud (560 watt models)
- Output bus bar (1,000 & 2200 watt models) with 1/4" - 20 studs
- Output "OK" L.E.D.
- Loss-of-output alarm contacts- Form C, plus loss of AC alarm contacts Form C (2200 watt units only)
- Front panel voltage test points

Model	Input Amps @ Full Load	Output			Watts	Weight	
		VDC V OUT	VDC V2	Amps Cont.+		Lbs	Kg.
PM-12-40	8.5/4.3	13.6	14.3	40	560	12.2	5.5
PM-12-70	16/8	13.6	14.3	70	1000	15.2	6.9
PM-24-20	8.5/4.3	27.2	27.9	20	560	12.2	5.5
PM-24-35	16/8	27.2	27.9	35	1000	15.2	6.9
PM-48-10	8.5/4.3	54.4	55.1	10	560	12.2	5.5
PM-48-18	16/8	54.4	55.1	18	1000	14.0	6.4
PM-48-50	*/22	54.4	—	50	2200	34	15

VDC (V OUT) Measured at output terminal with oring diode

* 230 VAC input only

* 230 VAC input only

VDC (V2) Measured at direct output terminal

+ For parallel configuration/load sharing derate output 10%

Performance Specifications

- Input: 85-135/170-270 VAC (selectable), 47-63 Hz. 560 & 1000 watt models. 207-253 VAC only 2200 watt models
- Power Factor: 0.7
- Regulation: $\pm 1\%$ at direct output (V^2); $\pm 2\%$ through "oring" diode (V out)
- Ripple: 1% (Typical)
- Efficiency: 80-85% @ full load
- Front panel Output Voltage adjustment pot range: $\pm 10\%$
- Altitude Range: Full output to 5,000 feet. Derate output current 4% per 1,000 feet to 10,000 feet max.

Design Standards

- UL 1950 / EN 60950 (Safety)
- EN 50082 (Immunity)
- EN 55014 (Conducted)

Options

- Three stage charger function with gel/lead-acid selector Model: CFB 560 & 1000 watt units only
- Temperature compensation (for battery charging). All models.
- DC quick connect wiring kit, 560 & 1000 watt Models: QCK-3 (for 2-3 unit PM system), QCK-6 (for 4-6 unit PM system), CCK-4 (2200 watt models)
- "Universal" mounting bracket; Model: UMB-PM (500 & 1KW models only)
- Metering, alarms, LVD and distribution breakers (PFM-400 option)

Temperature Rating

560 & 1000 watt models: -40° C to +60° C; Derate linearly from 100% load @ 50°C to 75% @ 60° C

2200 watt models: 0-50°C

Case Size

Inches		
H	W*	D
3.5	17	20.5
Centimeters		
13.5	43.2	52.1

*19" and 23" mounting brackets provided



Powering the Network

Power Function Manager

The Power Function Manager (PFM-400) is a system integrating component which converts ordinary power supplies (or Power Modules, shown on the opposite page) into a fully integrated and multifunctional power system. The unit provides for control, monitoring, paralleling and protection of 12, 24 or 48 VDC, positive negative or floating ground power sources.

The PFM has a heavy duty (400 amp) parallel tie point bus, digital output voltage and amperage monitoring, system and battery status lights, load distribution circuits, low voltage battery disconnect (ideal for systems with battery back-up) and summary alarm contacts, all combined in a compact, rackmount housing which serves as a master DC power management and distribution center. A high amp rackmount ground/return bus is provided.

The PFM may be used for integration, control, monitoring and protection of numerous different types of power sources, such as AC-DC rectifiers, regulated power supplies or DC-DC converters. Note: Installation of Oring diodes recommended for paralleling of most power sources. Oring diode output is standard on PM Series Power Modules.



Model	Nominal Input/Output VDC	Circuit Breaker Capacity	Digital Meter Display	Weight (lbs./kg.)
PFM-400	12, 24, or 48 pos. or neg. ground	5	Volts or Amps	20/9.1

Features/Benefits

- Provides parallel tie point for DC power modules; simplifies wiring
- 12, 24 or 48 VDC input/output; can be used with virtually any DC system
- Use with positive, negative or floating ground; no need to stock multiple units to meet different site requirements
- Digital meter displays system voltage or current via selector switch, providing easy on-site monitoring of battery and power module output
- Status lights indicate system and battery connect/disconnect status, assisting technicians in system troubleshooting
- Summary alarm contacts (form C) allow remote indication of system status
- Low voltage battery disconnect protects batteries in the event of extended AC power loss
- Manual battery disconnect switch allows service/replacement of batteries without system shutdown
- High current output bus for wiring main system load or for feeding an external distribution panel.
- Separate high amp ground bus provided
- Up to five optional isolated distribution circuit breakers with "TRIP" alarm contacts; easy front panel plug-in installation (for circuits requiring individual control/protection).



PM/PFM System

Overall Performance

- Maximum Total Current Capacity: 400 amps (max. 6 power supply/modules)
- Digital meter accuracy: 1.6% +/- one digit
- Circuit breaker voltage rating: 80 VDC (see Options for available amperages)

Protection

- Low voltage battery disconnect (See adjacent LVBD Specifications)

Mechanical/General

- Heavy duty plated copper bus bar
- Anodized aluminum front/side panels
- 19" or 23", 2 RU, flush or 6" forward rackmount

Indicators/Alarms

- System output "OK" L.E.D. indicator
- "BATTERY ONLINE" L.E.D. indicator
- LVBD "OPEN" L.E.D. indicator
- Form C summary alarm contacts: power module failure, LVBD activation, tripped load breaker

Low Voltage Battery Disconnect Specifications

Factory set actuation voltages:

	12 VDC	24 VDC	48 VDC
Connect	12.4	24.8	50.0
Disconnect	10.4	20.0	40.0

- Min/Max Connect/Disconnect Voltages User adjustable $\pm 15\%$

- Max continuous current: 400 amps

Temperature Rating

-40° C to +60° C

Options

- Plug-in mid-trip circuit breakers with auxiliary contacts that activate "CHECK SYSTEM" indicator and summary alarm contacts. Available Amperages: 5, 10, 15, 20, 30, 40, 50, 75, 100 (specify model PBA-5, PBA-10, etc.)
- Quick connect DC wiring harness for use with Newmar 1 KW Power Modules; QCK-3, CCK-4 (page 16)
- Rear rack covers (page 16)
- Power Modules (opposite page)
- Additional Distribution: Model DST-10 (UL) or DST-20A(UL) (page 11)



Powering the Network

Hot Swap Rectifier Systems

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Medium Power - 550 Watts/Rectifier

The Centurion Rectifier System comprises a low profile 3.5" (2 RU) shelf which accommodates up to three 550 watt, -48 or +24 volt hot-swap rectifiers, plus a voltage control and alarm module. The system is scalable/adaptable for N, N+1 or N+2 configurations. And is ideal for powering network transmitters.

Local and remote monitoring is provided by alarm contacts which report system off, as well as major and minor rectifier conditions via alarm contacts and front panel warning LEDs. Engineered for compatibility with NEWMAR's PFM-400, Power Function Manager to create an integrated power system with metering, alarms, low voltage disconnect and distribution circuit breakers (see catalog page 5 for details.)

Rectifier Specifications

Input Voltage/Frequency/Power Factor:

85-264 VAC* / 47-63 Hz. / .96-.98

Input Amperage: 6 amps @ 115V and full load,
3 amps @ 230V and full load

Output Voltage/Amperage:

CR48-10: -54.4 VDC, 10 amps continuous

CR24-20: +27.2 VDC, 20 amps continuous

Regulation: +/- 2 %

Ripple: CR24-20: 150 mV

CR48-10: 250 mV

Protection: Over-voltage, current limiting, over-temp, forced air cooling, input and output fuses

Indicators: Front panel LED indications: "DC OK/DC FAIL"

Operating Temperature: -10°C to +60°C

Approvals: UL 1950, CE



Features

- 550 watt rectifier units, 48 or 24 volt, slide and lock into the Centurion Shelf
- Shelf accommodates up to three rectifiers—1650 watts total
- Front panel status indicators, output voltage test points and voltage adjustment
- Alarm relay contacts for output OK, minor and major alarms
- Shelf adapts for 19" or 23" rack; center or flush mount

Shelf Specifications

Capacity: Up to Three Centurion

Rectifiers, -48 or +24 volt

Front panel voltage test points and system single point voltage adjustment

Alarms/Indicators:

- Output OK (Form A)
- Minor Alarm (Form C)
- Major Alarm (Form C)
- Battery Over-Temperature (with optional sensor)
- 10 segment LED output current bar graph

Size/Wt.: 3.5" H x 17.15" W x 21.5" D / 10 Lbs.

Mounting: With 19" or 23" rack; center or flush mount/adapters

Options

- PFM-400, Power Function Manager creates a fully integrated power system with Metering, alarms, low voltage disconnect, and distribution circuit breakers. (See catalog page 5 for details.)

Go to www.newmartelecom.com/550w for detailed specifications.

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Webpage!



High Power - 1600 Watts/Rectifier

This High Density Power System provides a high degree of flexibility and scalability in its Rectifier, Distribution and Control/Monitor components.

Rectifier

- High power density in 2 RU package
- 48 volt: 1600 watts (50 amps) or 24 volt: 1400 watt (60 amps)
- Hot swap architecture; add or replace modules quickly
- Numerous front panel LED indicator/alarms plus contacts for external alarm

The Rectifier Power Shelf has multiple bays that accept both pluggable rectifiers and breaker distribution modules in a low profile 2 RU 19"

or 23" architecture. Scale up redundant systems by using multiple rectifiers, route power to system loads with distribution modules and parallel shelves to increase output power.

The Controller is programmable to monitor essential system functions and interface with alarm settings, and log data and monitor/control remotely via SNMP interface.

19" shelf: Four bays

- All bays accept rectifiers, one bay alternatively accepts circuit distribution module
- Maximum power fully populated with rectifiers: 48 volt: 200 amps
24 volt: 200 amps

23" shelf: Five bays

- All bays accept rectifiers, two bays alternatively accept circuit distribution modules
- Maximum power fully populated with rectifiers: 48 volt: 250 amps
24 volt: 250 amps

Controller/Monitor

- Monitors all major system conditions: Rectifier voltage, current and temperature; battery voltage, capacity and temperature; circuit breaker status
- Local monitoring via front panel LCD or laptop Serial Port
- Remote monitoring SNMP and/or TCP/IP

Power Distribution Shelf Mount

- Slides into specially configured shelf bay in place of rectifier
- 5 load and/or battery breaker capacity per module
- Internal low voltage battery disconnect

Rack Mount Distribution Panel

- 20 position plug-in breaker panel, model DST-20A (UL), see page 11

Go to www.newmartelecom.com/1600w for detailed specifications.



Powering the Network

Integrated Power Systems

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The Integrated Power System (IPS) is a unique multifunction power supply which incorporates built-in battery back-up and numerous power accessories within a single 2RU (3.5") chassis, thus eliminating time-consuming system integration, component sourcing and installation, while saving precious rack space—ideal for any low-to-medium power application requiring AC fault tolerant operation.



Specifications

Model	Input Amps @ Full Load	Output			Internal Battery Capacity	Ground Reference
		VDC	Adjustment Range	Amps Continuous		
IPS 48-11	11 / 5.5	54.4	40-60 VDC	11	40 Amps	5 A-H Positive
IPS 24-22	11 / 5.5	27.2	20-30 VDC	22	40 Amps	10 A-H Negative
IPS 12-40	11 / 5.5	13.6	10-15 VDC	40	N/A	20 A-H Negative

AC Input

Input Range (switch selectable):
 115V = 92-130 VAC
 230V = 184-260 VAC
Frequency: 47-63 Hz

DC Output

Voltage/Amperage: See Matrix above
Maximum Load with External Rectifier and Battery Inputs: 40 amps
Regulation: Line: ± 1 %, Load: ± 2 %
Ripple: ± 1 %

Power Scaling via Back Panel Quick Connects

External Rectifier Input: 24V, 48V only;
 560 or 1,000 watt (see PM Series page 6)
External Battery Bank: 12V/24V/48V

Environmental

Temperature Rating: -10° to + 60° C;
 Derate linearly from 100% load @ 50° C to 75% @ 60° C

Mechanical

Chassis: Aluminum
Rack Size: 19" or 23", 2 RU (3.5")
Cooling: Forced Air
Dimensions: 3.5"H x 17"W x 18"D
Weight: 33 Lbs. (with batteries)
 17 Lbs. (without batteries)

Protection

- Current Limit, Short Circuit
- Over Voltage
- Auto Thermal Shutdown/Recovery
- Input Fuse and Circuit Breaker
- Circuit Breaker For Internal Battery
- Low Voltage Battery Disconnect (Adjustable)

Internal Batteries

Type: 12 Volt, 5 A-H Sealed Lead-Acid Maintenance-Free
Amp-Hour Capacity: See Matrix below
Weight: 4 Lbs. each; 4 Batteries per Unit
Approvals: UL Recognized, DOT and IATA approved for shipment by air

Indicators and Alarms

System "Nominal" indicator lights:

- AC OK
- External Rectifier ON/OK*
**Except IPS-12-40*
- Internal Rectifier On/OK
- Battery Contactor Closed

System "Warning" indicator lights:

- Check System
- Battery Disconnected

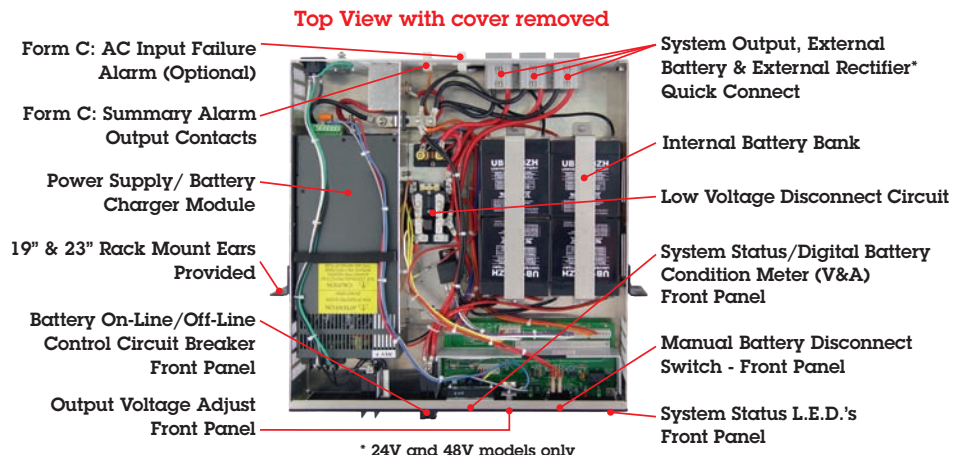
Form C Alarm Contacts:

- Summary Failure
- AC Input Failure (Optional)

Options

- AC Input Fail Contacts** - Specify 115 or 230 VAC
- Rectifier/Battery Input Cable Assembly** (Model CA-24)
- Rear Support Bracket for Flush Mounting**
 Models: RSB-19 or RSB-23
- Distribution Panel** Models: DST-10 (UL), DST-20A (UL)
- Unit Supplied Without Batteries**

MODEL	Internal Battery Constant Current Performance (Amps) to 1.75 VPC				
	5 MIN.	15 MIN.	30 MIN.	1 HR.	2 HRS.
IPS 48-11	15.0	8.0	5.0	3.0	2.0
IPS 24-22	30.0	16.0	10.0	6.0	4.0
IPS 12-40	40.0	32.0	20.0	12.0	8.0



Powering the Network

Rackmount - Inverters

These inverters provide seamless back-up power for AC powered communications equipment from the site's 48 or 24 VDC battery system. A fast-acting transfer switch ensures voice and data transmissions remain uninterrupted in the event of a power grid failure or if the site utility power is disconnected for maintenance and upgrade purposes. Built in a 2RU case adaptable for 19" and 23" rack installations.



Features

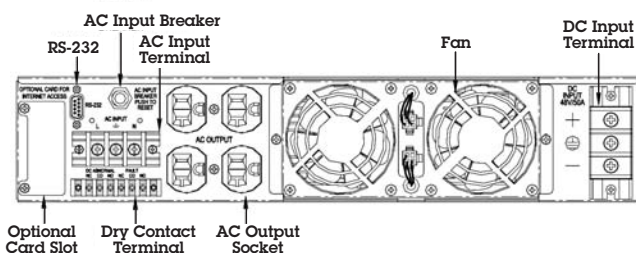
- Pure sine wave AC output powers telecom equipment without performance degradation
- Continuous duty rated – full output wattage maintained even during extended power outages
- 1000 VA and 2000 VA models available – easily cascaded for N+1 redundancy, providing maximum reliability required by data centers
- Low EMI and RFI interference characteristics
- User-friendly Status and Diagnostic LCD/LED displays
- Utility bypass function with fast load transfer switch
- Remote Power Management optional via RS-232 port
- Optional SNMP card
- Numerous circuit and load protections – over-current, over-temp, overload, reverse polarity, high/low battery voltage
- Form C alarm contacts for monitoring AC "Fault" and "DC Abnormal" conditions
- UL and cUL listed

Mechanical

Dimensions: 17.4"W x 3.5"H x 11.6"D

Mounting: 19" or 23" Rack

Rear View



AC Characteristics

Voltage: 100/110/115/120 VAC (selectable using RS-232 port and additional software); Factory set at 115 VAC

Frequency: 60 Hz. Standard, 50 Hz. Optional

Regulation: +/- 2%

Wave Form: Pure Sine

Total Harmonic Distortion: 6% 120V/100% linear load 4%

120V/100% SPS load

Transfer Time: <4 ms.

Specifications

Model	DC Input		AC Output		Weight (lbs.)
	Voltage	Amps	KVA	WATTS	
48-1000RM	40-60	25	1 KVA	800	15.4
48-2000RM	40-60	50	2 KVA	1600	17.6
24-1000RM	20-30	50	1 KVA	800	15.4
125-1000RM	100-150	10	1 KVA	800	15.4
125-2000RM	100-150	20	2 KVA	1600	17.6
48-1000IRM*	40-60	25	1 KVA	800	15.4
48-2000IRM*	40-60	50	2 KVA	1600	17.6

* I series models use IEC type AC output connector

Displays

LED: Inverter On, Overload, DC Abnormal, Fault

LCD: Inverter On, Output Voltage and Frequency, Input Voltage, Load Percentage, DC Voltage, System Model, Internal Environment Temperature, Utility Status, Short Circuit, Over Temperature

Operating Temperature: 0° to 45° C

Cooling: Forced air, front-to-back

Humidity: 0-90% relative humidity

Acoustic Noise: 46 dBA @ 1 M

Alarms

Form C (Dry Contact) terminals (two sets – "DC ABNORMAL" and "FAULT")

Communication Interface

RS-232 port, serial cable included

Protection Features

DC Input Fuse and Breaker, AC Input Breaker, Output Breaker, Short Circuit, Overload, Over Temperature, Over/Under Output Voltage, Over/Under Input Voltage, Fan Failure Detection

Options

Remote monitor via RS 232 port. SNMP card required.



Powering the Network

Rackmount DC Converters

Communication sites require isolated DC Converters to provide excellent voltage regulation, low noise, and high efficiency voltage conversion. Reliability is vital under continuous duty operation and high ambient temperatures. All these aspects were incorporated in the design of our rackmount DC Converters.

These units accept a wide input range at 24 or 48 VDC nominal, positive or negative ground, and produce pure 12 or 24 volt power. The solid state circuitry is conservatively designed and semi-conductors are selected and tested to withstand 200% of normal operating power.

Output voltage is maintained within 1% for all line and load conditions and the output is well filtered, allowing use with sensitive transceivers and telecom equipment.



Features

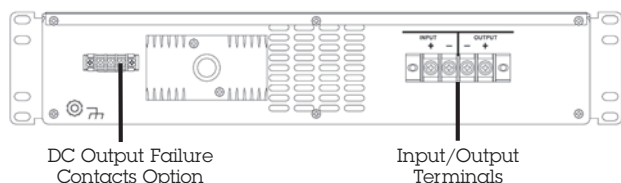
- 48, 24 volt inputs; 12, 24 volt outputs; positive, negative or floating ground.
- Input/Output-chassis isolation – 250 VDC
- 400 watt output
- Rated for continuous duty at full load.
- Excellent regulation under all line/load conditions.
- Low ripple provides noise free output.
- High efficiency – 87% typical.
- Easily adapts to both 19" and 23" racks, center 6" from front mount
- Output volt and ammeter
- Output voltage adjustment on front panel
- Low profile – occupies two RU (one RU space above and below recommended for cooling)

Model	Input		Output			Weight Lbs Kg.	Dimensions					
	Voltage (VDC)	Max Amps	Voltage (VDC)	Adjustment Range	Amperage (continuous)		Inches			Centimeters		
48-12-30RM	40-60	12	13.6	12.6-14.5	30	10 4.6	3.5	19/23	14	8.9	48.3/58.4	35.6
48-24-15RM	40-60	12	27.2	25.2-29.0	15	10 4.6	3.5	19/23	14	8.9	48.3/58.4	35.6
24-12-30RM	20-30	24	13.6	12.6-14.5	30	10 4.6	3.5	19/23	14	8.9	48.3/58.4	35.6

Performance

- Regulation: 1% line/load
- Ripple: +/- 1/2% peak-peak max.
- Idle Current: 48V: <100 mA
24V: 300 mA
- Efficiency: 85% typical @ 50% load.
- Operating Temperature: -20° to 50° C
- Isolation: 250 volts input-out put-chassis.

Rear View



Mechanical

- Powder coated aluminum front panel, vinyl coated aluminum case.
- Mounting brackets provided for 19" or 23" rackmount, center or front.

- Easy access terminal blocks on back of unit, with protective cover
- Front panel switch guard provided.
- Output voltage adjustment potentiometer recessed in front panel

Protection

- Input and Output circuit breaker.
- Current limited/short circuit proof.
- High/low input voltage shutdown
- Fail-safe components guard against output over-voltage condition.
- Automatic high temperature power reduction starting at 65° C heat sink temp.
- Automatic thermal shut down and recovery @ 80° C heat sink temp. (automatic reset @ 55° C heat sink temp).
- Reverse polarity protection.

Options

- Operation as battery charger and /or parallel redundant operation. (Heat sink mounted oring diode installed in series with the output)
- Output Failure Alarm Contacts; Form C
- Current protection recommended on charging leads



Powering the Network

Fuse Distribution Panel

These fuse panels are ideal for DC distribution to low power loads in 24 and 48 volt positive and negative ground network applications and provide enhanced system reliability via dual input buses which allow configuration with redundant power sources. Each input bus accommodates 10 or 20 GMT output fuses (depending on model) in ratings up to 15 amps. Form C alarm contacts provide remote monitoring of input power and blown fuse conditions. Front panel LEDs indicates normal operation, fuse failure mode, as well as a user configured external alarm signal. Their low profile 1.75" (1 RU) occupies minimal space and can be configured for 19 or 23 inch rack mounting.



Model	Nominal Input/Output	Total Fuse Capacity	Amps per Bus (Dual Bus)	Total Current Capacity
FDP-1010	+/- 24 or 48 VDC	20	100	200A
FDP-2020	+/- 24 or 48 VDC	40	100	200A

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Features

- GMT Fuse
- Form "C" alarm contacts
- Polarity insensitive panels work with positive and negative ground systems -/+ 24 or -/+ 48 VDC
- 1RU (1.75") in height will configure to 19" or 23" rack mounting

Operating Temperature

-20° to +60° C
-5° to + 140° F

Compliances

NEBS 3 certified

Mechanical

- Steel case painted flat black with white graphics
- Mounting ears provided for 19" and 23" rackmount, flush mount or 6" offset
- 1 RU (1.75"), can be zero clearance mounted directly adjacent to other equipment

Front Panel Details

- LED status indicators:
 - Normal Operation
 - Fuse Alarm
 - External alarm
- Easy accessible fuse blocks
- Spare fuse holder

Alarms

- Form C alarm contacts for each bus
- External ground input alarm (bay or rack alarms)

Specifications

Nominal Input/Output:

+/- 24 or +/- 48 VDC

Total Fuse Capacity:

FDP 1010 - 10 GMT fuses per bus

FDP 2020 - 20 GMT fuses per bus

Total Current Capacity:

FDP 1010: 200 amps (dual 100 amp bus)

FDP 2020: 200 amps (dual 100 amp bus)

Fuse Holder & Fuse Rating:

15 amps max.

GMT Fuses, available amperages: 1, 3, 5, 10, 15

Other ratings available upon request

Note: Fuses sold separately

Rear Panel Details

- Input Terminal Block: Two 1/4" studs on 5/8" centers
- Output and Alarm Terminal Blocks:
 - FDP 1010: Barrier Terminal Block; #22 to #10 AWG wire for fork or ring #6 screw
 - FDP 2020: Elevator clamp style terminal block; #26 to #12 AWG wire.
- Cable Management Bar
- Clear Lexan cover protects wiring connections

Case Size

(Inches)			(Centimeters)		
H	W	D	H	W	D
1.75	17	11.5	4.5	43.2	29.2

Weight: 8 pounds



Powering the Network

Circuit Breaker Distribution Panel

The DST is a high density Rackmount Distribution Panel designed to accommodate virtually any 48 VDC, 24 VDC or 12 VDC power distribution requirement. Its flexibility makes it ideal for all telecom site power requirements, large and small.

These distribution panels accommodate up to 10 or 20 circuit breakers (depending on model) within a compact rackmount housing, occupying only 2 RU of rack space. The circuit breakers feature a unique plug-in design which requires only front access for quick, easy installation during initial power system configuration, as well as future system expansion.



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Features

Model DST-20A (UL) features dual isolated 10 circuit A and B buses, each rated at 450 amps, enabling redundant power configuration or different voltages/ground references. A and B inputs can also be paralleled, creating a single 900 amp bus.

Model DST-10 (UL) has a single 450 amp bus which accepts up to 10 breakers.

The plug-in circuit breakers insert securely into sockets recessed in the front access panel. Breaker alarm contacts allow optional remote tripped-breaker alarm/indication. A "mid-trip" function of the circuit breaker provides quick visual identification of a failed circuit and distinguishes between an over-current trip and intentional shut-off. When tripped, the toggle handle moves to a 90° position, halfway between the "on" and manual "off" position.

Note: The DST is shipped standard without circuit breakers.

Specifications

Electrical

Nominal Input/Output:

48VDC, 24VDC or 12 VDC

Total Circuit Capacity:

DST-20A: 20 Breakers

DST-10: 10 Breakers

Total Current Capacity:

DST-20A: 900 amps (dual 450 amp buses)

DST-10: 450 amps (one 450 amp bus)

Maximum Circuits per Bus: 10

Compliances

UL Listed:

1801 First Edition: Subject Standard for Power Distribution Center for Telecommunications Equipment

C22.2 No. 225-M90: Canadian Standards for Telecommunication Equipment

CE Marked

Circuit Breakers

UL Recognized

CE Marked

Current Ratings: 5, 10, 15, 20, 30, 40, 50, 75 or 100 amps

Breaker rating stamped beside toggle for easy reference

Voltage Rating: 80 VDC max.

Type: Plug-in with Auxiliary Contacts

Weight: 1 Lb



UL US LISTED

Specify the required amperages when ordering and plug them into the panel during installation.

Input/output wiring is rear access via bus bars that accept single or double hole lugs. Input/output buses are secured to the load breaker sockets via solid nickel-plated copper bus material.

Mounting brackets are provided to adapt the panel for 19" or 23" racks. Snap-in hole plugs are provided for unoccupied breaker positions and a clear protective cover which prevents accidental shut off of the breakers and also provides for convenient placement of circuit identification labels.

Mechanical

Bus Bars: Nickel-plated copper; accepts single or double hole lugs

Front Panel: Anodized aluminum

Cover, Rear Panel: Vinyl-laminated aluminum

Dimensions: (Both models)

(Inches)			(Centimeters)		
H	W	D	H	W	D
3.5	19/23	11	8.9	48.3/58.4	27.9

Weight (no breakers installed): DST-20A: 12 lbs., DST-10: 9 lbs.

Options

Return Bus Bar Assembly - Rear Rack Mount

800 amps; Model BBA-800

Rear Terminal Cover Assemblies

Model: RC-DST

Covers rear, top, sides of bus bars. (DST must be flush mounted to rack face for installation of cover)

Model: RRC

Covers rear, top, sides of multiple components in relay rack. Specify 19" or 23", 3 RU or 7 RU height. (DST may be either center or flush mount to use cover)

Alarm/Indicator

Tripped Breaker Contacts via Rear Panel Connector; Normally Open configuration

Note: Separate contacts for each bus on model DST-20A



Powering the Network

Site Power Monitor

Remote Monitoring of Critical Site Conditions Sensor Input Examples

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Solar Panel Voltage



Enclosure Power Supply

- DC Voltage
- DC Current



Low Voltage Disconnect

- Disconnect Status
- Battery Voltage



Rectifier/Battery Charger

- DC Bus Voltage
- Output Current



DC Distribution Panels

- Bus Voltage
- Load Current
- Breaker Trip Alarm



DC Converter

- Input/Output Voltage
- Output Current



Inverter

- DC Input Voltage
- AC Output Voltage
- Alarms



Site Power System

- Alarms - Major/Minor
- Voltages
- Current
- Temperature



Battery

- Voltage: 12/24/48
- Charge/Discharge Current



Generator Voltage



AC Voltage



Ambient Temperature



Door Open Alarm



Powering the Network

Site Power Monitor

Remote Monitoring of Critical Site Conditions:

Sensor Data

- DC Bus/Battery Voltage
- DC System Amperage/Battery Charge-Discharge Current
- AC Voltage
- Ambient Temperature
- Dry Contacts/Alarms

Firmware

- Programmable Alarms
- Data Logging
- Ethernet Camera

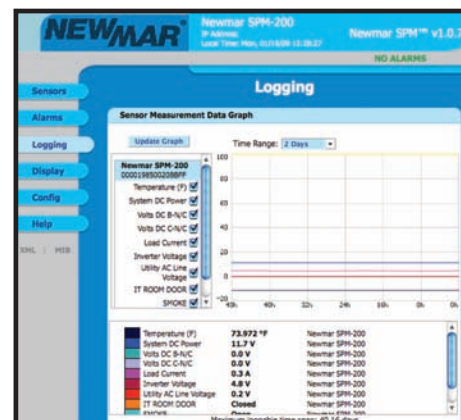
Reporting Via:

- Internet – Software Included
- E-Mail
- Cell Phone

Web-enable and integrate intelligence to any site's AC and DC power and sensor system for 24/7 monitoring, alarm condition notification, and data logging of vital functions. All programmable, accessible, and managed via the Internet: TCIP or SNMP. View current conditions and log 30 day history of DC and AC power status and other conditions at remote sites before dispatching personnel.

The Site Power Monitor is designed specifically for monitoring power supplies, rectifiers, batteries, converters, inverters, UPS, distribution panels, and AC power at communication sites, base stations, outdoor enclosure via Ethernet or Wireless connection. The palm sized unit can be rack, DIN-rail, or wall mounted and is easily adapted to virtually any make of power system via nine sensor input ports which capture and stream critical data via the internet for analysis and logging of site history. Web page based programs are easily user configured for site parameters with up to 50 desired alarm conditions settings and multiple automatic notification options by e-mail, PDA, and mobile phone.

Sites without internet access can use the monitor solely as a data logger that captures and retains 30 days' data, ready for download to lap top for site history file and analysis of component performance and failure conditions.



User friendly data screens

Specifications

Power Source Voltage

9-60 negative/positive ground, 250 mA max.

Monitor Inputs: 9 Total

Voltage

DC: 3 Ports:

- 2 each: 0-40 VDC
- 1 each: 36-60 VDC
- Accuracy: +/- 5%

AC: 2 Ports:

- 120/240 (90-264) utility power (L-N or L-L)
- 120/240 inverter output (floating)
- Accuracy: +/-5%

DC Current: 1 Port

- +/- 100mv, 100 amp differential shunt voltage
- Read battery charge/discharge, or load current
- Accuracy: +/-5%

Dry Contact Switch Sensors: 3 Ports

- Possible uses: door open, water leak detection, smoke alarm, component fail, breaker trip, high temperature

Ambient Temperature Sensor

- Located outside case of unit
- Range: -40 to +60° C, -40° to +140° F
- Accuracy: +/-0.5° C

Mechanical

Case: Aluminum, powder coat

Size/Weight: 2.18" x 3.27" x 4.66", 1 lb

Mounting options

- Wall mount
- DIN-rail
- 19 or 23 inch rack mount (via optional bracket) model RM- SPM

Environmental

Operating Temperature range -20° C to 60° C

Data Screens

- Sensors
- Alarm settings (customized web page)
- Data logging
- Camera feeds (4 max.)

Alarms

- 50 user configurable all with separate high/low trip settings
- Notification by Via Internet, e-mail or mobile phone
- User-programmable notification to 5 different e-mails addresses

Optional Accessories

Sensors

- Water
- Door/window open alarm
- Fire/smoke detector

Software

- Multi site monitor software – Model: 100 Site Software- SPM

Isolated DC Converter

- For powering **AND** monitoring a -48 VDC source. Model: 48-12-1i

Rack Mount Panel (pictured below)

- For 19/23" racks model: RM-SPM



Powering the Network

Batteries & Battery Module System

Batteries

Communication and wireless network power systems typically require back-up power capacity at 8-10 hour rates or more. It's important that reserve battery systems in stand-by applications are sized properly and utilize high quality cells resulting in a long design life. Many factors must be considered when specifying and selecting the proper batteries for these applications, including peak and average loads, current, run time, ambient temperature, battery chemistry type, energy density, and desired re-charge interval.

Newmar can assist you in specifying your battery strings and supply the proper system for your application. Once we determine your needs, we can have the batteries delivered directly to your site, as part of a complete rackmount power system, a battery rack, or just the batteries themselves. Please contact us and we'll do the analysis for you and recommend a cost effective, reliable turnkey system.

For related accessories, see page 15 for a selection of rackmount battery trays and page 16 for battery disconnect panels.



BM Series Battery Module

The BM Series Battery Module provides sealed, maintenance-free batteries in an easy to install rackmount shelf. Multiple modules may be paralleled for increased capacity.

The system comprises a rackmount Battery Shelf and one or two 48 VDC Battery Modules. The battery modules slide easily into the shelf and are secured in place with a rear retaining pin and a front panel latch.

Plug-in connector assemblies on rear panel provide quick connection to system load and/or paralleling multiple Battery Modules to meet run time requirements.



Features

- Battery Modules slide easily into shelf and plug quickly into DC power systems; shelf accommodates 2 Modules
- Modules and shelf fit together in low profile design – only 2RU (3.5")
- Plug-in connector assemblies enable quick, easy, plug-and-play installation
- Mounting brackets provided with battery shelf adapt for both 19" and 23" racks, 6" forward mount configuration

Specifications

Model	Voltage		Reserve Capacity	Circuit Breaker Protection
	Nominal VDC	Float VDC		
BM-48-4	48	54.4	4 Amp-Hour	15 amp

Internal Battery

Constant Current Performance (Amps) to 1.75 VPC

MODEL	5 MIN.	15 MIN.	30 MIN.	1 HR.	2 HRS.
BM 48-4	15.0	8.0	5.0	3.0	2.0

- **Battery Type:** Lead-Acid; Sealed, maintenance-free AGM. IATA and D.O.T. certified for shipment by air.
- **Typical Battery Life:** 3-5 years in standby use

Case Size

	Inches	Centimeters	Weight (Lbs/Kg)
Battery Module	3.4 H x 7.4W x 18.8D	8.6 H x 18.8 W x 47.8 D	20/9
Battery Shelf	3.5 H x 19/23 W x 18.2 D	8.9 H x 48.3/58.4 W x 46.2 D	5/2.3

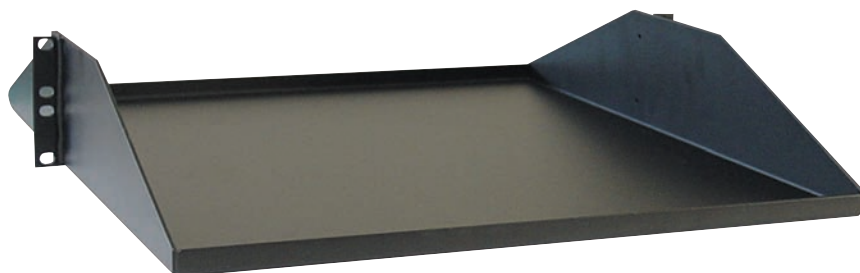


Powering the Network

Rackmount Trays and Shelves

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Battery Trays

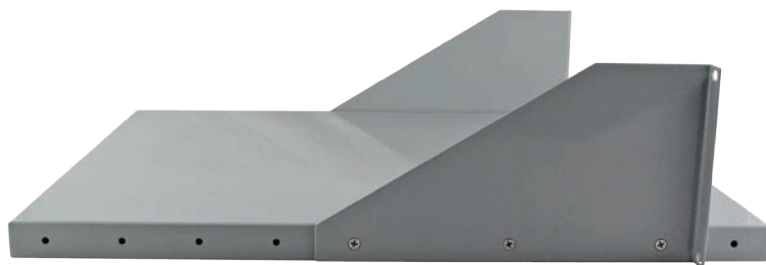


- Heavy gauge cold rolled steel trays fit standard 19" racks
- Ideal for holding up to four 100 amp-hour front terminal batteries
- Powder coat finish
- Mounting hardware supplied

23" trays also available in various depths. Contact factory and specify requirements.

Model	Tray Area	Weight Capacity	Colors	Ship Weight
BT 19" x 19"	17.25" x 19.04"	350 lbs	Black	12 lbs
BT 19" x 21"	17.25" x 22.3"	400 lbs	Black or Gray	17 lbs

Adjustable Equipment Rack Shelves



- Fits standard 19" racks
- Adjustable depth for balancing and desired front projection
- 16 gauge cold rolled steel with powder coated finish
- Flanged sides for added strength
- Supports up to 200 lbs.
- Mounting hardware included

Model	Shelf Area	Weight Capacity	Colors	Ship Weight
RS 19" x 16" Adjustable	17.56" x 16"	200 lbs	Black or Gray	10 lbs
RS 19" x 20" Adjustable	17.56" x 20"	200 lbs	Black or Gray	11 lbs

Ventilated Equipment Rack Shelves



- Fits standard 19" racks
- Vent holes in tray bottom allow air flow to cool equipment
- 16 gauge cold rolled steel with powder coated finish
- Supports up to 150 lbs
- Mounting hardware included

Model	Shelf Area	Weight Capacity	Colors	Ship Weight
RS 19" x 15" Ventilated	17.5" x 14.87"	150 lbs	Black or Gray	10 lbs

Power Plant Accessories

Battery Disconnect Panels

- Provides over-current protection in high current battery wiring applications
- Provides a convenient means of disconnecting batteries from power plant during servicing
- High current single pole breaker is mounted into dedicated black finish panel
- Auxiliary contacts standard (form C)
- Adapts for 19" or 23" racks.
- Voltage Rating: 12, 24 or 48 VDC

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Model	Circuit Breaker Position	Available Amperage
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BDP-1	1	50, 75, 100
BDP-2	2	50, 75, 100

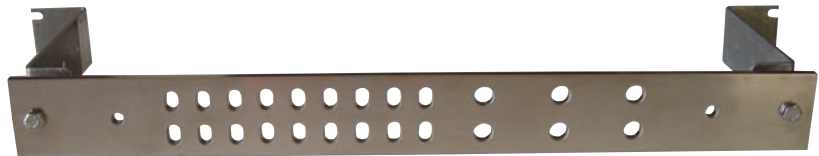
Special order 125 to 400 amp panels available - contact factory



Bus Bars

- 800 amp rated nickel-plated copper bus bar for use as heavy duty DC positive or negative connection point in rack installations
- Mounts to rear of rack; adaptable to 19" or 23" rack widths
- All mounting hardware including isolated stand-offs provided
- Multiple attachment holes in two sizes provided for single and dual hole lugs:
 - 18 ea. @ .312" x .500"
 - 6 ea. @ .437" round
 - 4 ea. @ .281" round
- Bar is 2" high x 1/4" thick x 19 1/2" wide, 4 lbs.
- Projection depth from rear of rack: 7 1/2 inches

Model: BBA-800



DC Quick Connect Wiring Kits

- Allow for quick installation and removal of rectifiers
- Designed specifically for use with NEWMAR PM Series Power Modules and Power Function Manager (see pages 4-5) in stacked rack configuration.
- Wiring harness is fitted with "Anderson" quick-connect and ring lug terminals; all wires tie-tie-wrapped into proper position for quick and easy installation.
- Simplifies parallel wiring of up to 6 modules
- Facilitates "hot" change-out of modules without system shutdown
- Wire gauge 6 AWG

Models:

QCK-3 for 2-3 Power Modules; 3 lbs.

QCK-6 for up to 6 Power Modules; 4 lbs.

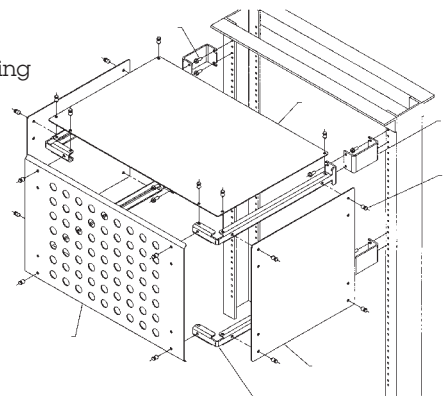
CCK-4 for up to 4 Power Modules (2200 Watt); 6 lbs.



Rear Rack Covers

- Clear plastic panels attach to rear of racks to protect service personnel by preventing accidental contact with "live" terminals, etc., from top, sides and rear.
- Holes in rear panels allow for flow-through ventilation of fan-cooled components
- Model indicates height of cover in rack units and rack width in inches:
 - RRC-3-19 3 RU, 19" rack
 - RRC-7-19 7 RU, 19" rack
 - RRC-3-23 3 RU, 23" rack
 - RRC-7-23 7 RU, 23" rack
- May be installed at 14" or 17" rear depth
- Multiple covers may be stacked to accommodate system height
- All mounting hardware included
- Weight: 2 lbs.

Special 2RU rear cover also available for DST panels - see page 11



Powering the Network

Enclosure Power System

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Power Supply, battery charger, alarms, and low voltage disconnect all in one unit.

The Enclosure Power System is designed specifically for outdoor cabinet applications which typically include back up batteries. The environmentally hardened power circuitry provides 12 or 24 volts to the load and maintains the back-up batteries. A sense circuit adjusts charge voltage based on temperature ensuring batteries are properly maintained no matter the climate.

A low voltage disconnect circuit removes the load from the batteries after an extended power outage, thus preventing total discharge and allowing rapid replenishment when AC is restored. There are also alarm contacts that can be user configured to monitor several vital functions of the system and relay information to base station that service is needed.

The low profile rugged anodized aluminum case is designed for enclosure mount, either on back plane or din rail. Front panel terminals for AC input, battery and load provide easy wiring access.



Typical pole mount application with Enclosure Power System, battery and transmitter.

Specifications

Model	AC Input	Output Volts	Amps	Temp. Comp. Range (VDC)
EP 12-10	85-265	12	10	12.9 - 14.9
EP 24-5	85-265	24	5	25.8 - 29.8

Protection

Over voltage
Over current
Fuse protected input & battery
Low voltage disconnect
12 V: 11.9 VDC
24 V: 23.8 VDC

Mechanical

Case: Vinyl laminated aluminum
Fasteners: Stainless Steel
Mounting: Wall/Back Pane or DIN-Rail

Alarms/Indicators

AC input or P/S Output Fail Alarm: (Form C contacts)
Indicator LED's:
AC (Power available)
Load (Power available)
Alarm

Environmental

Operating Temperature: -20°C to +60°C (-4°F to +140°F)

Size/Weight

6.18" H x 9.75" W x 3.34" D / 3 lbs.



Powering the Network

Battery Chargers - Phase Three Series

Phase Three "Smart" battery charging technology is now available in a wide range of power levels, allowing you to select the right size, features and flexibility you require for virtually any application from providing quick recharge of auxiliary batteries in vehicles parked in the station house, to powering continuous loads and maintaining peak charge in large battery systems in remote communication sites as well as industrial generator and marine applications. These chargers interact with batteries to put them through the optimum three stage charge process which provides for fastest recovery and ideal conditioning, maximizing battery performance and extending battery life.

A selector switch adjusts output voltage to adapt for gel-cell/flooded lead-acid/AGM battery types. An optional temperature compensation sensor also adjusts output for ideal voltage based on changes in the batteries' ambient temperature. All models are housed in a rugged stainless steel case with a durable white powder coat finish, and the internal circuitry is polyurethane coated for maximum corrosion resistance.

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Features

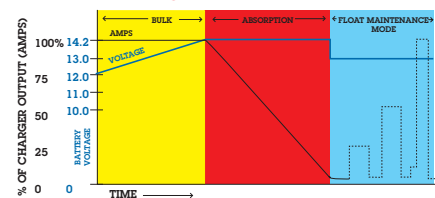
- "Smart" circuitry provides three stage charging—bulk, absorption, float.
- Wide model range covers battery system ratings from 14-950 amp-hours
- Gel-Cell/Flooded Lead-acid/AGM battery type switch selects optimum charge/float voltages.
- Multiple isolated output banks; ammeter indicates total output current. (except PT-7)
- Optional sensor adjusts output voltage based on battery temperature (except PT-7).
- Current limiting-prevents damage from overloading.
- Charger status clearly displayed with L.E.D. and/or audible indicators or optional remote panel.
- Use as a power supply; can power loads without a battery in line.
- Built to last—rugged stainless steel case with a durable white powder coat finish with drip shield and polyurethane coated internal circuitry.
- Numerous Safety and EMC Compliances
- Two year parts and labor warranty

Models

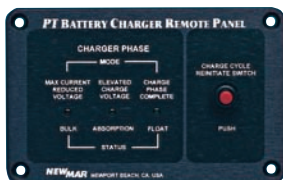
12 Volt	24 Volt	32 Volt
PT-14W	PT-24-8W	PT-32-25W
PT-25W	PT-24-13W	
PT-40	PT-24-20	
PT-80	PT-24-45U	
	PT-24-60W	
	PT-24-95U	

See next page for detailed specifications.

Typical Charge Curve



Optional Accessories



Remote Indicator Panel, Model: RP
(Not available for all models - refer to Specifications on following page)



DCE
DC Energy Monitor, reads Volts, Amps, Amp Hours (See page 23 for details)



Temperature Compensation Sensor, Model:
TCS-12/24 shown (see next page for applicable sensor depending on charger model)



Powering the Network

Battery Chargers - Phase Three Series

Specifications

	12 Volt Models					24 Volt Models					32 Volt	
	PT-7	PT-14W	PT-25W	PT-40U	PT-80	PT-24-8W	PT-24-13W	PT-24-20U	PT-24-45U	PT-24-60W	PT-24-95U	PT-32-25W
Input VAC (50-60 Hz.)	88-132 or 176-264	85-264	90-132 or 180-264	90-264	90-264	85-264	90-132 or 180-264	90-264	90-264	207-253	90-264	104-126
Input Amps @ Full Load @ 115 VAC	2	2.8	6.5	6.8	12	2.8	6.5	6.8	12	NA	26	15
@ 230 VAC	1	1.4	4	3.4	7	1.4	4	3.4	7	13	14	N/A
P.F. Rating	>.65	.93@230V .98@115V	.7	.95@230V .98@115V	.95@230V .98@115V	.93@230V .98@115V	.7	.95@230V .98@115V	.95@230V .98@115V	.7	.95@230V .98@115V	.7
Max Output Amps	7	14	25	40	80	8	13	20	45	60	95	25
Output Banks	2	3	3	3	3	3	3	3	3	3	3	3
Battery Capacity (Amp-Hours)	14-70	28-140	50-250	80-400	160-800	16-80	26-130	40-200	90-450	120-600	180-950	50-250
Operating Temp. Rating Reference	T-1	T-2	T-4	T-5	T-7	T-2	T-3	T-5	T-8	T-6	T-8	T-6
Case Size Ref. Weight; Lbs./Kg.	A-1 3.2/1.5	A-2 8/4	A-2 8.2/4	A-3 11/5	A-5 15.2/7	A-2 8/4	A-2 8.2/4	A-3 11/5	A-5 12.2/6	A-6 24.1/11	A-6 24.5/11	A-4 12.2/6
Optional Temp. Sensor Model	N/A	TCS-12/24	TCS-12/24	TCS-12/24	TCS-12/24	TCS-12/24	TCS-12/24	TCS-12/24	TCS-12/24	TP	TCS-12/24	TP
Remote Panel Model	N/A	RP	RP	RP	RP	RP	RP	RP	RP	N/A	RP	N/A
Equalize Option	No	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	No
Output Indicator Ref.	M-1	M-3	M-3	M-3	M-3	M-3	M-3	M-3	M-3	M-2	M-3	M-2
Compliance Ref.	CG, CE	CG, CE	CG	CG, CE	CG, CE	CG, CE	CG	CG, CE	EN, CE	EN, CE	EN, CE	EN, CE

Case Size:

Ref	Inches			Centimeters		
	H	W	D	H	W	D
A-1	10.5	5.0	2.8	26.7	12.7	7.1
A-2	12.5	7.7	4.3	31.8	19.6	10.9
A-3	13.85 [*]	9.5	4.8 [*]	35.2 [*]	24.1	12.2 [*]
A-4	13.8 ^A	9.8	5 ^A	35 ^A	24.9	12.7 ^A
A-5	14.8 ^B	9.6	5.6 ^B	37.6 ^B	24.4	14.2 ^B
A-6	17.5 ^C	12	7.2 ^C	44.5 ^C	30.5	18.3 ^C

With Dripshield Installed:

- * Add .75" (1.9 cm) to height and 1.35" (3.4 cm) to depth
- A** Add 1.27" (3.2 cm) to height and 1.1" (2.8 cm) to depth
- B** Add 1" (2.54 cm) to height and .5" (1.27 cm) to depth
- C** Add 2" (5.08 cm) to height and 1" (2.54 cm) to depth

Output Indicator References:

- M-1** Total output ammeter
- M-2** Charge/Float L.E.D.
- M-3** Total output ammeter and charger status L.E.D.'s/Alarms

Nominal Output Voltages at Gel/Flooded Switch Settings

(Without Temperature Compensation option installed or at 22.2°C (72°F) with Temperature Compensation option installed.)

Setting	12 Volt Models		24 Volt Models		32 Volt Model	
	Charge @ 50 % load	Float @ .5 amp load	Charge @ 50 % load	Float @ .5 amp load	Charge @ 50 % load	Float @ .5 amp load
Gel-Cell	14.0 VDC	13.6 VDC	28.0 VDC	27.2 VDC	37.3 VDC	36.2 VDC
Flooded/AGM	14.2 VDC	13.4 VDC	28.4 VDC	26.8 VDC	37.8 VDC	35.7 VDC

Temperature Compensation:

- 5 mV per cell per ° C. Sensor supplied with 25' cable and plug-in connector

Protection (all models):

Input/Output Fuses, Current Limiting, Thermal Protection, Forced Air Cooling, Drip Shield

Remote Panel, Model RP:

LED's indicate charger output stage. Button allows manual reinitialization of three stage charge cycle. Supplied with 25' cable and plug-in connector. Panel dimensions: 3" H x 4.75" W



Powering the Network

Battery Chargers - Phase Three Modular



Charger Modules "Plug-and-Play" Providing: Reliability & Serviceability in a Wall Mount Case

Phase Three Modular (PTM) Concept

The PTM consists of a case with three power bays, each accommodating a 550 watt charger module which slides and locks in place. If a module fault occurs, a front panel indicator is activated and the system continues operating on the remaining modules.

The system features three stage charging for rapid recharge and optimal battery life.

Go to www.newmartelecom.com/PTM for complete system specifications.

General System Specifications

Input Voltage/Frequency: 90-264 VAC, 47-63 Hz, single phase; derate linearly from 100% output @ 105 VAC to 80% output @ 90 VAC

Power Factor: .96-.99

Efficiency: 85 % typical

Temperature Rating: 0-60° C; derate linearly from 100% output @ 50° C to 80% output @ 60° C

Output Battery Banks: 3

Module Bays: 3*

Status Indicators: Output OK, Low Output Voltage, Check System/Module Fault, Battery Hot/Reduced Output, Total Output Current Bar Graph, Output Voltage Test Points

Alarm Contacts: Check System; Output OK/Fail



Options

Temperature Compensation Sensor - Model TCS-12/24: (See pages 18-19 for details)

System Model	Modules Installed*	Max Output Amps	Max Input Amps @ 115/230 VAC	Inches			Centimeters			Weight	
				H	W	D	H	W	D	lbs.	kg.
PTMS-12-100	3	100 @ 12 V	9 / 18	20.9	10.9	8.8	53.1	27.7	22.4	34	15.5
PTMS-24-67	3	67 @ 24 V	9 / 18	20.9	10.9	8.8	53.1	27.7	22.4	34	15.5

Battery Chargers - ABC Series

ABC Series

These chargers utilize time tested SCR charging circuitry, individually sensing and regulating each of 2 isolated battery banks, allowing the charger to operate indefinitely, even under no-load conditions without fear of overcharging.

The rugged and reliable ABC charger is employed in hostile environments throughout the world; in mining equipment, emergency service vehicles and rugged off-road applications.

Features

- Total output ammeter
- Dual independently regulated output banks
- Anodized aluminum case
- 115/230 VAC input selector switch
- Auto-reset thermal breaker
- Conformal coating of circuit board

Duty Cycle Ratings: Rated Charging Output 20 min., derate to 50% for continuous output

Operating Temperature: 0-40°C

Float Voltage: 13.4 VDC



ABC 12-25



ABC 12-8

Model	Input		Output			Inches			Centimeters			Weight	
	Volts	Amps*	Volts	Banks	Amps	H	W	D	H	W	D	(Lbs)	(Kg)
ABC 12-8	105-125 VAC or 210-250 VAC	1.5/.75	12	2	8	8.0	6.0	4.2	20.3	15.2	10.6	9	4.1
ABC 12-25	50-60Hz	5/2.5	12	2	25	11.9	4.7	6.2	30.2	11.9	15.8	14	6.4

*@ Full Load



Powering the Network

Inverter – Charger

NEW!



PERFECT WAVE
INTELLIGENCE PLUS

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Webpage!**

Pure Sine Wave Inverters with High Amperage 3 Step Charger

Introducing an innovative new series of Inverter-Chargers called "Intelligence Plus" because of their multi-function capability to produce supplemental power for peak loads when running shore power and generator sources and can limit its own AC power consumption when charging batteries, preventing AC system overloads. Integrated with a programmable smart 3-step high power charger, temperature compensation, alarms and other diagnostics, it has intelligence plus heavy duty electrical and mechanical design standards for high performance and survival in rugged mobile applications.

Features

- Heavy Duty field proven design and construction
- Pure sine "Perfect Wave" output runs sensitive electronics
- High surge ratings for motor starting
- Programmable input and output to match user profile and power availability
- High amperage three stage charger recovers batteries quickly
- Fast Transfer from stand by to full power status provides AC back up as UPS
- Supplements shore or generator power for peak loads
- Digital display on unit and remote provides easy monitoring
- Versatile bulk head or horizontal mounting options
- Rated for continuous output to 70°C

AC Output

- Produces true sine wave, with excellent voltage regulation, and frequency stabilization
- Programmable to supplement shore and generator sources for peak load sharing
- High surge current capability for motor starting

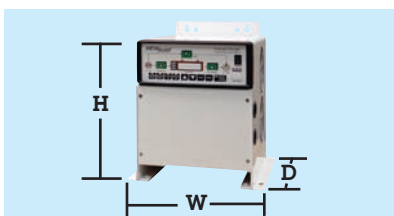
Battery Charging

- High Amperage temperature compensated, 3 step charger for main and auxiliary battery banks
- Programmable voltage and timer settings for virtually any battery type
- Programmable input current limit prevents overload of AC input source when charging dead batteries

Options

- Full function remote monitor/control panel

Case Size



A: 11.5" H x 10" W x 14.5" D; 66 Lbs.
B: 14.5" H x 12" W x 14.5" D; 77 Lbs.

Charger Model	Inverter Output Wattage						Inverter Output Voltage	Charger Output Amps	Case Ref.
	DC In	Cont	30 Min.	5 Min.	5 Sec.				
12-1850 ICIP	12	1500	1800	2000	3000	120, 60 Hz	70	A	
12-3550 ICIP	12	3000	3500	4000	6000	120, 60 Hz	140	B	
24-3550 ICIP	24	3000	3500	4000	6000	120, 60 Hz	70	B	
24-3550 ICIPF	24	3000	3500	4000	6000	230, 50-60 Hz	70	B	



Powering the Network

Power Supplies - Heavy Duty Series

These super-rugged DC supplies are ideal for powering 12 and 24 volt communication equipment in base stations, remote sites and mobile communication applications where reliability is essential. The proven linear circuit design provides pure output and long life.

Features

- Excellent Regulation and Ripple Spec: Output voltage maintained within 1% under all line and load conditions within rating
- Polyurethane conformal coated PC board and corrosion resistant heavy duty aluminum case with integral shock mounts assures survival in hostile environments
- Heat generated by semi-conductors is extracted and dissipated by large heat sink fins for cool operation.
- Protection: overvoltage, current limit; (set @ 105% of intermittent rating), thermal overload and input/output fusing.
- Thermally activated cooling fan on "CD" units.

Input Range

105-125/210-250 VAC (selectable), 50-60 Hz
Derate to 50% output below 110 and 220 VAC

Operating Temperature

Standard Units

0-50°C, Derate Linearly From 100% @ 40°C To 50% @ 50°C Thermal shutdown @ 85°C Case temperature

C.D. Units

0-65°C, Derate Linearly From 100% @ 50°C To 50% @ 65°C Thermal Shutdown @ 85°C Case temperature

Duty Cycle

Intermittent: 20 minutes max on time, 20% duty

Continuous: 24 Hours/Day 100% Duty

Options

- Modify for use as a Battery Charger
- Output voltage adjust (see Output Voltage for range)

Output Voltage

12 V Models:

13.6 VDC (Internally adjustable 12.6-14.5 VDC)
Ripple: 40mV P-P (@ 110-125 / 220-250 VAC input)

24 V Models:

24.5 VDC (Internally adjustable 21-27.5 VDC)
Ripple: 70mV P-P (@ 110-125 / 220-250 VAC input)

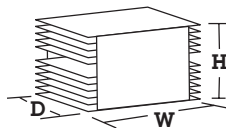
Regulation All Models: 1% Line and Load (@ 110-125 / 220-250 VAC input)



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Specifications

Model	Nominal Input/VAC	Output Amperage		Case Size Ref.	Weight	
		Intermittent	Continuous		Lbs.	Kg.
12 Volt Output						
115-12-8	115/230	8	5	P-2	10	4.5
115-12-20A	115/230	20	8	P-3	20	9.1
115-12-35CD	115/230	35	35	P-5	32	14.6
24-Volt Output						
115-24-10	115/230	10	4	P-3	20	9.1
115-24-18CD	115/230	18	18	P-5	32	14.6
115-24-35CD	115/230	35	35	P-6	60	27.3



	Inches			Centimeters		
	H	W	D	H	W	D
P-2	6.0	4.6	8.5	15.2	11.7	21.6
P-3	5.7	4.8	16.3	14.5	12.2	41.4
P-5	6.5	9.5	14.0	16.5	24.1	35.6
P-6	6.5	13.0	18.75	16.5	33.0	47.6

Power-Pac: Power Supply With Built-in Battery Back-up



Designed for critical base stations and repeater sites that must remain "on-line", even in the event of AC power failure or brown-out which would disable conventional power supplies. The Power-Pac offers peace of mind for the system designer or base station operator. This unique power supply assures that a base station can remain up and running to power communications when it is often needed most - during a power outage.

Model	Battery Capacity	Weight	
		lbs.	kg.
Power-Pac 7A/H	7 amp/hour	18	8.2
Power-Pac 14A/H	14 amp/hour	24	10.9

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See www.newmartelecom.com/power-pac for detailed specifications.



Powering the Network

Battery Integrators & Isolators

Battery Integrators

The Battery Integrator enables charging of two separate banks from a single source, yet maintains 100% isolation at all other times. A voltage comparator circuit and low resistance contactor act as a "smart" switch, connecting independent battery banks only when a charging voltage is present, then disconnecting them for selective discharge. Because diodes are not used, there is no voltage drop



BI-100; 12 volts, 100 amps max
BI-24-100; 24 volts, 100 amps max

Battery Isolators

Heavy duty isolators allow charging multiple batteries automatically from one or two alternators and prevent discharge from one battery bank to another. Each battery is charged according to need without overcharging. Rated for 12-48 volt negative ground systems.

Models*: 1-2-70; 1-3-70; 1-2-120;
 1-3-120; 2-3-70; 2-3-120; 1-3-165.

* Model # Key:
 Alternator
 Inputs-Battery
 Bank Outputs-
 Alternator Amps



NOTE: These battery isolators are not compatible with self exciting alternators. Please consult the manufacturer of your alternator if you are unsure of your configuration.

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Automatic Power Selectors

Automatic Power Selector

The Automatic Power Selector (APS) is a solid state device which enables installation of a seamless, redundant power system for critical electronic loads. It selects the higher voltage of two isolated DC power sources and routes power to the load. Should one source falter or fail, the other will automatically supply the load with no transfer delay, operation continues uninterrupted.

Easy installation, two independent power sources are wired to the APS and routed in a single output to the vital load. Rugged, rust-proof anodized aluminum case.

Models:

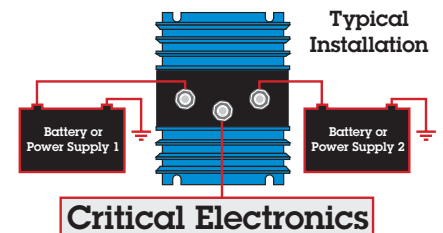
APS-70 Max. Load 70 amps., 3.25" x 4.5" x 3.1", 2 lbs..

APS-160 Max. Load 160 amps, 9.0" x 4.5" x 3.1", 5 lbs.

Voltage Rating: 6-50 VDC, neg. ground



APS-70



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Digital Meters

Digital Instruments for AC/DC Systems

These highly versatile digital instruments enable continuous and comprehensive monitoring of fixed site or mobile AC and DC electrical systems. They provide quick easy-to-read and accurate information on all important aspects of electrical system status: voltage, current, power consumed, power available and AC frequency. In addition, abnormal system conditions such as high/low voltage trigger user-adjustable alarms.

All read-outs and programming are controlled via touch pads on the instrument face. LCD displays are easily read, even in bright sunlight. Backlighting is provided for use at night or in low-light installations. Instruments mount in 2 1/8" diameter hole and standard instrument faces are 2 1/2" square. ACE and DCE are now available in large scale, 4 1/4" X 4 1/4" face.

Models

DCV Displays DC volts for three battery banks. High/low voltage alarms. 2 1/2" square face.

DCE Displays DC volts, amps, energy used/remaining in battery system; 500 amp shunt included. High/low voltage, low amp-hour alarms. Specify 2 1/2" or 4 1/4" square face.

ACE Displays volts, amps, frequency and wattage of 115/230 VAC systems. High/low volt/frequency alarms. Current transformer included. Specify 2 1/2" or 4 1/4" square face.



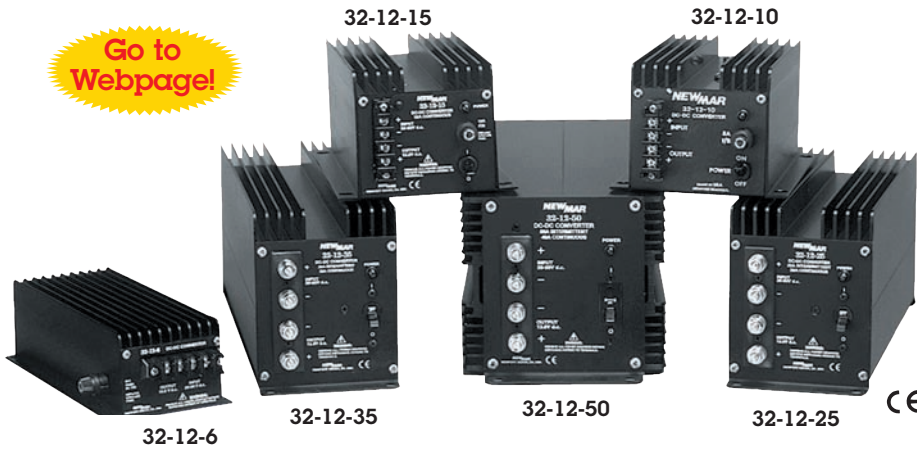
DCE



Powering the Network

DC-DC Converters – Standard Series

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Model	Input Voltage	Output Voltage	Output Amps Intermittent	Output Amps Continuous	Case Size	Weight (Lbs.)	Weight (Kg.)
24-12-3	17-32	13.6	3	3	C-11	1	.45
32-12-6	20-50	13.6	6	6	C-10	2.5	1.1
32-24-6	32-50	24.5	6	6	C-10	2.5	1.1
32-12-10	20-50	13.6	10	10	C-2	4	1.8
32-24-10	32-50	24.5	10	10	C-2	4	1.8
32-12-15	20-50	13.6	15	15	C-2	5	2.3
32-24-15	32-50	24.5	15	15	C-2	5	2.3
32-12-25	20-50	13.6	25	20	C-3	7.5	3.4
32-24-25	32-50	24.5	25	20	C-3	7.5	3.4
32-12-35	20-50	13.6	35	30	C-4	12	5.5
32-24-35	32-50	24.5	35	30	C-4	12	5.5
32-12-50	20-50	13.6	50	40	C-5	16	7.3
32-24-50	32-50	24.5	50	40	C-5	16	7.3

Performance Specifications – Standard Series

Output: 13.6 VDC (internally adjustable 12.6-14.5) or 24.5 VDC (or specify)

Ripple: 150 mV P-P maximum

Regulation: 1% Line/Load

Duty Cycle Ratings* Intermittent - 20 minutes max on time, 20% duty.
Current limit set at approx. 105% of intermittent rating
Continuous - 24 hours, 100% duty
*24-12-3: 2 minute max. on time

Idle Current: Less than 100 mA (including power "ON" light)

Operating Temp: 0-50° C, Derate Linearly From 100% @ 40° C To 50% @ 50° C
Thermal shutdown @ 70° C Case Temperature
Model 24-12-3: Full output -25° C to + 30° C; Derate linearly from 100% @ +30° C to 45% @ +50° C

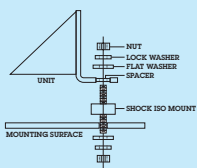
Switching Frequency: 40 KHz

Efficiency : 85% - Typical.

Isolation – Output/ Chassis; Input/Chassis: 250 VDC

Certification : Carries the CE mark

Option: Extreme Vibration Mounting Kit



The Extreme Vibration Mounting Kit is available to protect NEWMAR power converters from the extreme stresses of shock and vibration when mounted on high-vibration vehicles.

The kit (pictured here) replaces the standard vibration kit

provided with the unit and fits into the unit's mounting flange to act as a "super shock absorber" for electronics in high-vibe applications. It is available to fit all NEWMAR units from 2 to 70 lbs. Specify KIT-L for units which weigh 2-15 lbs. and Kit-H for units which weigh 16-70 lbs.

Convert 20-50 VDC to 12 or 24 VDC negative ground output for powering communication/navigation equipment, on negative ground systems. (see Isolated series, opposite page for positive ground applications.) Ideal for powering voice and data transceivers in mobile applications.

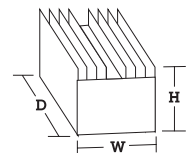
- Excellent Regulation: Output voltage maintained within 1% under all line and load conditions within rating.
- Heat generated by semi-conductors is extracted and dissipated by large heat sink fins that maximize air contact for cool operation and long life of components.
- Polyurethane conformal coating on PC boards and corrosion-resistant anodized aluminum case with heavy duty shock mounts assure survival in hostile environments.
- Numerous converter and load protection circuits: Current limiting*; automatic thermal shutdown; short circuit proof*; reverse polarity and overvoltage protection*.

Options

- Operation as battery charger or parallel redundant operation* – derate to continuous duty rating (contact factory)
- Extreme vibration mounting kit. (Information below)
* Except Model: 24-12-3

Case Size

	Inches			Centimeters		
	H	W	D	H	W	D
C-1	2.7	4.5	6.0	6.9	11.4	15.2
C-2	4.5	5.9	11.0	11.4	15.0	27.9
C-3	6.0	4.7	14.0	15.2	11.9	35.6
C-4	6.0	4.7	16.0	15.2	11.9	40.6
C-5	6.2	6.8	18.1	15.7	17.3	46.0
C-10	2.8	4.2	10.4	7.1	10.7	26.4
C-11	3.5	3.5	1.75	8.9	8.9	4.5



DC-DC Converters – Isolated & ISP Series

Isolated Series

As well as voltage conversion, this series provides input/output isolation, allowing use of negative ground electronics on off-highway vehicles which typically employ positive ground battery systems. May also be used as a voltage stabilizer for sensitive equipment (see page 26).

ISP Series

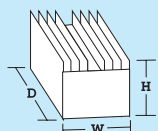
offer the benefits of an isolated converter (above) plus protection against line transients and voltage spikes typically caused by large DC motors and switching transients often encountered on fork lifts, locomotives and light rail. A special circuit clamps input spikes to a safe level, protecting both the converter and the powered equipment.

This product series is further enhanced with extra rugged construction of case and internal components for severe vibration applications.

Features: Isolated & ISP Series

reverse polarity protection; input fuse; output fuse; current limiting, short circuit proof output; automatic resetting thermal shutdown; input transient protection*; high/low input voltage shutdown; polyurethane conformal coating on PC board. Power "ON" light. On/off switch; *ISP Series only

Case Size



Dimensions

	Inches			Centimeters		
	H	W	D	H	W	D
C-6	6.0	4.6	13.7	15.2	11.7	34.8
C-7	4.25	5.9	7.7	10.8	15.0	19.6
C-8	4.25	5.9	14.0	10.8	15.0	35.6
C-9	6.0	6.8	16.5	15.2	17.3	41.9

Options

- operation as a battery charger or parallel/ redundant operation (contact factory)
- High vibration mounting kit (see page 18)
- Other "Special" output voltages available

ISP Surge Protection

Transient Energy Capability:

36 VDC Input:

140 joules (Watt-Seconds)
Peak Current, 2,000 Amps

72 & 110 VDC Input:

100 Joules (Watt-Seconds)
Peak Current, 12,000 Amps

Temperature Specifications - ISP Series

Operating Temperature -40° C to +80° C
Thermal shutdown @ 85° C Case Temperature

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72-12-6 ISP



110-12-18 ISP



36-12-18 ISP

Isolated Series

Model	Input Voltage	Output Voltage	Output Amps		Case Size	Weight	
			Intermittent	Continuous		Lbs	Kg
12-12-12I	10-16**	13.6	12	8	C-8	6	2.7
12-24-6I		24.5	6	4			
12-12-35I	10-16**	13.6	35	20	C-9	12	5.5
12-24-18I		24.5	18	10			
48-12-6I	20-56	13.6	6	6	C-7	7	2.7
48-24-3I		24.5	3	3			
48-12-12I	20-56	13.6	12	8	C-8	6	2.7
48-24-6I		24.5	6	4			
48-12-18I	20-56	13.6	18	10	C-8	8	3.6
48-24-9I		24.5	9	5			
48-12-35I	20-56	13.6	35	20	C-9	12	5.5
48-24-18I		24.5	18	10			

**11.5 VDC minimum start-up voltage, then operates @ 10-16 VDC from 1 amp minimum to full load

Performance Specifications: Isolated and ISP Series

Output: 13.6 VDC (internally adjustable 12.6-14.5) or 24.5 VDC (or specify)

Ripple: 150 mV P-P

Regulation: +/- 2% Line/Load

Duty Cycle Ratings*: Intermittent - 20

minutes, max on time, 20% duty,

Continuous - 24 hours, 100% duty

*Current limit set at approximately 105% of intermittent rating

Idle Current: (including power "on" indicator light) approx. 50 mA

Operating Temp

Isolated Series: 0-50° C; derate linearly from 100% @ 40° C to 50% @ 50° C

ISP Series: see temperature rating curves (below)

Switching Frequency: 70Khz

Efficiency: 85% - typical.

DC Isolation: Input/Output, Input/Chassis, Output/Chassis:

I Series: 250 VDC

ISP Series: 1,400 VDC

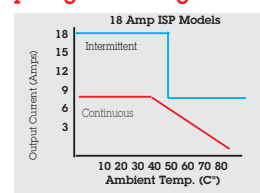
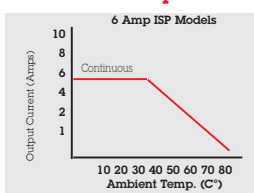
ISP Series

Model	Input Voltage	Output Voltage	Output Amps		Case Size	Weight	
			Intermittent	Continuous		Lbs	Kg
36-12-6ISP†	18-65	13.6	6	6	C-7	5	2.3
36-24-3ISP		24.5	3	3			
36-12-18ISP	20-65	13.6	18	10	C-6	8	3.6
36-24-9ISP		24.5	9	5			
36-12-35ISP*	20-65	13.6	35	20	C-9	12	5.5
72-12-6ISP	42-90	13.6	6	6	C-7	5	2.3
72-24-3ISP		24.5	3	3			
72-12-18ISP	42-90	13.6	18	10	C-6	8	3.6
72-24-9ISP		24.5	9	5			
110-12-18ISP	80-140	13.6	18	10	C-6	8	3.6
110-24-9ISP		24.5	9	5			

† This model EMC and safety CE certified for sales within the European Union.

*Build to order only - 10 unit minimum

ISP Series Temperature/Amperage Derating Curves



Powering the Network

Mobile DC UPS

Mobile Data Power System



The Mobile Data Power, model MDP-25, is a DC UPS that solves the common problem of lengthy reboot sequences, system crash, data and hard drive corruption in mobile computer work stations due to a low voltage and loss of power as a result of intermittent or poor vehicle battery condition. In addition, the MDP provides a low voltage output warning signal to terminals (such as Motorola® MW 800 series work stations) allowing orderly automatic shutdown of the powered device, protecting data and preventing hard drive corruption.

Utilizing a high speed sensor circuit, when primary vehicle voltage drops below a critical point, the internal 9AH battery is switched on-line in milli-seconds, assuring no interruption to the powered device(s). The MDP-25 has an internal 3 step, temperature compensated charger that maintains its reserve battery at full charge, ready to go on-line when a fault or degradation of primary vehicle battery occurs. This functionality assures continued operation of mobile computers under a variety of adverse vehicle battery conditions.

Housed in a rugged aluminum case and heavy duty mounting plate, the unit is designed for installation in emergency vehicles, service and other utility vehicles that require a steady source of voltage for mobile computers, work stations, and electronics.

Protects mobile computers against system crash, lengthy reboot sequences, and loss of data due to:

- Voltage dip during engine cranking
- Voltage drop and decay due to loading high power accessories, and aging batteries
- Voltage loss due to cycling of master disconnect switch and battery failure.

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Provides supplemental voltage in milli-seconds to mobile data devices when low vehicle battery is sensed.

- Immediately augments power to electronics when needed and fully powers electronics if critical low voltage condition persists.

Built-in Multi-Stage filter provides clean power required by mobile electronics

- Eliminates noise and interference
- Transient protection prevents damage to sensitive circuitry due to voltage spikes

Provides output warning signals to mobile computers (such as Motorola® MW 800 series work stations)

- Initiates low voltage shut down sequence in mobile computer, protecting data and hard drive.
- Alerts when system is operating on battery back-up

Internal 3 stage, temperature compensated charger maintains back-up battery in fully charge stand-by state.

- Provides isolated power source, 12 volts @ 5 amps for 60 minutes, 10 amps for 20 minutes, 25 amps for 8 minutes
- Battery easily accessed by front panel door

Model MDP-25

Input range: 10.2V – 15.5V (start-up @ 11.5V)

Standby Current Draw: <50mA

Output: 12 VDC

Maximum Load Current: 25 amps

Battery Connect Sequences

- Internal battery switches online when vehicle battery voltage = 10 V ± 1 V (Vehicle battery disconnects after 3 seconds if low voltage condition persists)
- Vehicle battery reconnects @ 11.5 V ± 1 V
- Internal Battery Low Voltage Disconnect: < 9.6 V

Battery Specification

- 9 AH, sealed Lead Acid – typical life 5 years, easily replaced via front panel access door.
- Power delivery @ > 10.2 volts @ 25°C
 - 5 amps @ 60 minutes
 - 10 amps @ 20 minutes
 - 25 amps @ 8 minutes

Output Signals for terminals (such as Motorola® 800 series work stations):

- When imminent Voltage decay to 11.5 VDC is projected (adjustable set point)
- On Charge/Discharge

Internal Battery Charger

- Charge Current: 2 amps max., three-stage (Bulk, Absorption, Float)
- Temperature Compensated

Temperature rating:

Operating 0 – 50° C

Mechanical:

- Aluminum case with access door for easy removal of battery
- Heavy duty mounting suitable for commercial vehicle use
- Size: 5.75" H x 6" W x 8.5" D; (14.6 x 15.24 x 21.59 cm)
- Weight: 9.4 lbs.

Options

- Remote LED indicator panel
 - Power OK
 - Operating on Back-Up



Powering the Network

Mobile DC UPS

StartGuard™

The abrupt DC system voltage drop that accompanies engine starting can cause microprocessor-based voice and data transmitters to "dump" programmed memory.



Provides Voltage Protection During Engine Start

StartGuard solves this problem by providing supplemental voltage to sensitive electronics while the engine is cranked. It contains a sealed rechargeable battery which is switched on-line to electronics when the starter switch or solenoid is engaged. When the engine is running StartGuard automatically goes off-line and the internal battery is recharged by the alternator.

Specifications

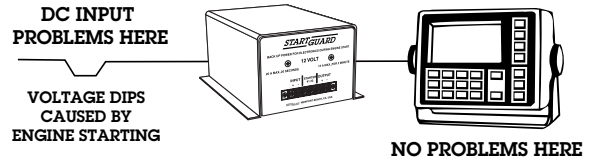
Input Voltage: 13.8 - 14.8 VDC nominal, 15.5 VDC max.

Relay Activation Input Voltage: 7-15 VDC

Output: 20 amps max.

Battery: 12 VDC, sealed rechargeable, 5- 7 year life (typical) 5 amp-hour capacity, Certified by DOT and IATA for shipment by air.

Back-up Capacity (Fully Charged): (See matrix)



Model	Input	Back-Up Capacity		Dimensions		Weight	
		1 Minute	2 Minutes	Inches	Centimeters	Lbs	Kg.
NS-12-20	13.8-14.8 VDC Nominal 15.5 VDC Max	20 amps	18 amps	8.25 x 4.9 x 3.5	20.1 x 12.5 x 8.9	5.5	2.5

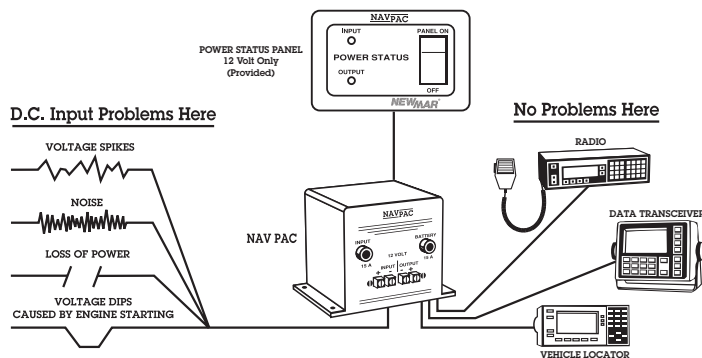
NAV-PAC™

Mobile communication electronics such as programmable two-way radio and data transceivers, vehicle location systems and other microprocessor-controlled devices require clean and steady DC input power. Their sensitive circuitry is highly vulnerable to voltage drop from engine start, noise and line spikes from alternators and motors, and conducted noise from various other electronic devices. NAV-PAC prevents all of these problems and is in use by thousands of Emergency Vehicles nation wide.

- Prevents voltage "drop-out" during engine start
- Absorbs line "spikes"
- Filters out electrical interference
- Provides supplemental voltage/battery back-up for up to 15 min.
- Remote monitor panel provided



Provides Continuous Voltage Protection



Model: NP-12

U.S. PATENT #: 5172292

Output: 20 amps Max. @ 12 Volt

Back-Up Power:

- 8 Amps for fifteen (15) minutes
- 12 Amps for eight (8) minutes
- 18 Amps for two (2) minutes
- 20 Amps for one (1) minute

Battery: Sealed Rechargeable 5.0 Amp-Hour, 5-7 years typical life, can be replaced. Low-voltage disconnect circuit protects battery from total discharge. Certified by DOT and IATA for shipment by air.

Noise Filtering: Audio through 200 MHZ

Voltage Spike Protection: Transient energy capability; 100 Joules, 4,000 amps Max (8 x 20 micro seconds)

Size (H x W x D): 5.25" x 6.2" x 7.4" (13.3 X 15.7 X 18.8 cm)

Weight: 5.9 lbs., 2.7 Kg.,

Panel Dimensions: 3.5" W x 2" H (8.9 x 5.1 cm)



Powering the Network

DC Power Conditioners

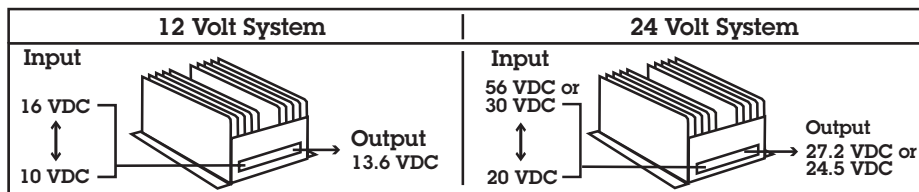
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12-12-31

12 & 24 Volt Stabilizing Converters

Feed sensitive electronics with proper voltage regardless of battery condition. These stabilizing converters provide continuous, precisely regulated output over the entire range of a battery's usable voltage. This prevents subjecting loads to fluctuating input voltage which can cause shutdown, diminish performance and possibly damage sensitive circuitry.



Application benefits include:

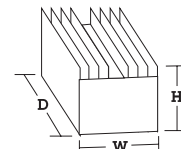
- Operate electronics at optimal input voltage, even from nearly drained batteries
- Boost voltage to compensate for voltage drops in long wire runs from batteries
- Eliminate voltage drops during momentary high current drain from batteries, as during engine start
- Eliminate voltage fluctuation from charge sources
- Eliminate voltage overshoot due to sudden removal of high current load

Options/Factory Modifications

- Operation as a battery charger (contact factory)
- Parallel/redundant operation (contact factory)
- High vibration mounting kit (see page 24)
- Non-standard output voltage (contact factory)

These converters provide total input/output isolation, virtually eliminating conducted line noise and permitting connection of negative ground loads to positive or floating ground systems, or vice versa. They can also be modified for use as battery chargers, allowing maintenance of a battery at a great distance from the charging source, providing reserve power if the main source fails. The rugged anodized aluminum case is ideal for mobile applications

Model	Input voltage	Output voltage	Output Amps Intermittent	Case Size (H x W x D)		Weight	
				Inches	Centimeters	Lbs.	Kg.
12-12-3I	10-16	13.6	3	3.5 x 3.5 x 1.75	8.9 x 8.9 x 4.5	1	.45
12-12-6I	10-16	13.6	6	3.5 x 3.5 x 1.75	8.9 x 8.9 x 4.5	1	.45
12-12-12I	10-16*	13.6	12	4.25 x 5.9 x 14.0	10.8 x 15.0 x 35.6	6	2.7
12-12-35I	10-16*	13.6	35	6.0 x 6.8 x 16.5	15.2 x 17.3 x 41.9	12	5.5
24-24-3I	20-32	27.2	3	6.0 x 6.8 x 16.5	15.2 x 17.3 x 41.9	12	5.5
24-24-7I	20-32	27.2	7	7.0 x 3.5 x 1.75	7.0 x 3.5 x 1.75	2	.9
48-24-9I	20-56	24.5	9	4.25 x 5.9 x 14.0	10.8 x 15.0 x 35.6	8	3.6
48-24-18I	20-56	24.5	18	6.0 x 6.8 x 16.5	15.2 x 17.3 x 41.9	12	5.5



*11.5 VDC minimum start-up voltage, then operates @ 10-16 VDC from 1 amp minimum to full load

See page 19, for additional Isolated Series Converters specifications and mechanical description.

Noise Filters

The interference or electronic "noise" generated by alternators, ignition systems, motors, etc., can render a vehicle's radio, data receivers or other electronic equipment virtually useless. This interference takes the form of popping or static on radios or audio gear and garbled images or "hash" on video displays.

These specialized filters can be used singly or in combination to attenuate conducted line noise, either at the affected equipment or at the noise source. The "PC" models feature inductor and capacitor circuit that filters both the "+" and "-" leads. The "IF" model utilizes an inductor and filters the "+" lead only.

Filter Features

- Heavy duty construction
- Operate on 6-48 VDC systems
- Integral mounting flanges for secure installation, except model IF-16 which is secured in place by tie-wrap
- Nickel-plated brass stud connectors on alternator filter (model 150A) accommodate high current cables and terminals
- Color coded wire leads on all other models make in-line installation easy

Models

- 150A** Alternator filter, 150 amps
- PC-10** Affected equipment inductor/capacitor, filters "+" and "-" leads, 10 amps
- PC-25** Affected equipment inductor/capacitor, filters "+" and "-" leads, 25 amps
- IF-16** Affected equipment inductor, filters "+" lead only, 16 amps



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NEW!



Powering the Network

Battery Disconnects

TMR-30: Disconnect Timer

Eliminate dead vehicle batteries caused by power drain from radios and data terminals that must operate while the engine is off. Allows use of accessory loads per programmed time limit while preserving battery for engine start

- Programmable disconnect time limit, 15 minutes to 15 hours, so that you can match your auxiliary load use to battery capacity, providing maximum run time yet still ensuring adequate reserve for engine start.
- Prevents dead batteries due to accessories being left on and forgotten.
- Once power off circuit is activated, power to auxiliary circuits is automatically restored when engine started, no delay in use of equipment.
- Low and High Voltage Disconnect
- Simple 3 wire installation: 1) Power in from battery, 2) power out to loads, 3) chassis ground. Optional ignition sense wire resets power on without having to start engine.
- Rugged construction, cast aluminum case with epoxy potted components, designed to withstand heat and vibration of engine compartment applications, and perform in demanding emergency vehicle applications.
- 30 amp rating: Power timer can be applied to multiple auxiliary loads/circuits. Multiple devices can be left on during emergency calls without running engine.

Model: TMR-30

Rating: 12 volt nominal, 30 amps, 3 mA standby current

Protection: In-Line fuse, low and high voltage disconnect

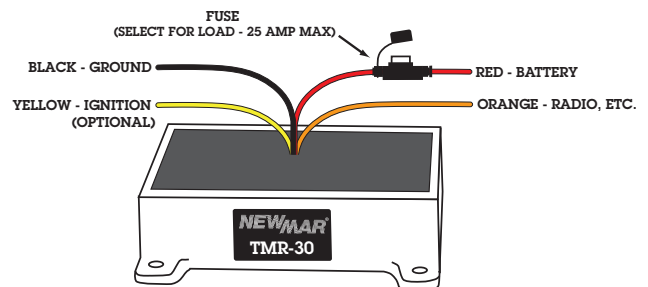
Mechanical: Cast aluminum case with epoxy potted components

Size: 3 7/8" L X 3" D X 1 1/4" H

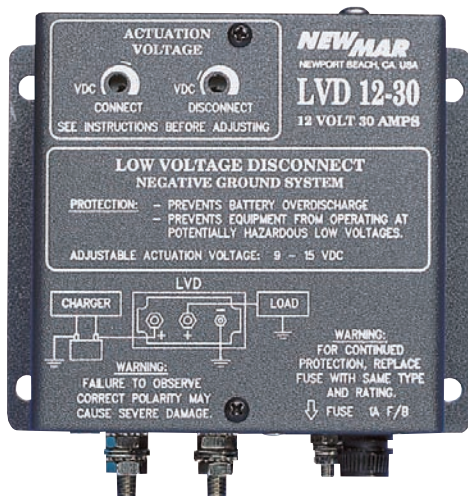
Weight: 1 lb



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LVD: Low Voltage Disconnects



Discharging batteries beyond a critical low voltage can damage the batteries and/or load, and require a longer recharge interval. A low voltage disconnect prevents this condition. The LVD contains a sense and control circuit housed in a compact, rugged, vinyl-clad aluminum case. It is installed in-line between the battery and the load. The unit continually monitors battery voltage and if it falls below a preset voltage threshold, the load is automatically disconnected. When batteries are recharged past another pre-set voltage the load is reconnected. connect and disconnect points are user adjustable.

Models:

LVD 12-30, LVD 12-75 (Neg. Ground)

LVD 24-50 (Neg. Ground)

LVD 48-30 (Pos. Ground)

For high current model, see PFM-400 Pg.5

Specifications

Factory Set Actuation Voltages:

	12 VOLT	24 VOLT	48 VOLT
Disconnect	10.4 VDC	21.0 VDC	42.0VDC
Connect	12.2 VDC	24.5 VDC	49.0VDC

Voltage and Contact Current Ratings:

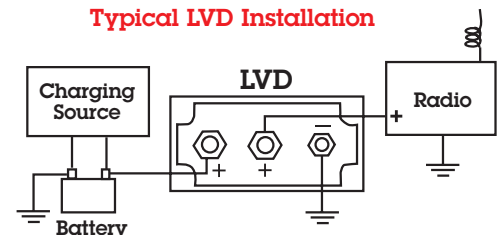
Indicated By Model Number (i.e., LVD 12-30 = 12 Volts, 30 amps Continuous)

Dimensions (mounted vertically, all models): 5.25" High x 5.25" Wide x 3.5" Deep

Weight: (All models): 1LB.

Operating Temperature: 0-50 °C

Typical LVD Installation



Thru-Dex PX Series Junction Boxes

- Waterproof junction box with terminal strip for electronic connections in areas subject to spray, washdowns, etc.
- Rugged, non-corrosive polypropylene housing
- "Universal" cut-to-fit cable entries, diameter range: .14 -.81"
- Brass compression screw terminals
- Wire gauge: 16 AWG

Model	Terminals
PX-1	6 pair
PX-2	12 pair
PX-3	18 pair



Thru-Dex BX Series Junction Boxes

- Splash proof junction box with terminal strip
- Rugged cast aluminum box and cover with enamel finish
- Multiple rubber grommet cable entries
- Brass compression screw terminals

Model	Terminals	Wire Gauge
BX-1	6 pair	16 AWG
BX-2	12 pair	16 AWG
BX-3	22 pair	14 AWG



CCX Series Feed-Through Fittings

- Create a 100% waterproof seal when routing cables through communication huts, cabinets, etc.
- Allow installation/removal with connector still attached
- Rugged weatherproof nylon with neoprene seal
- Entry hole predrilled

Model	Cable Dia. Range	Max Conn. Dia.
CCX-R	.47"-.59"	1.57"
CCX-S	.35"-.55"	.83"
CCX-T	.18"-.35"	.83"



DX Series Feed-Through Fittings

- Similar to CCX Series except installer drills holes in seal to accommodate cable(s)
- Multiple cables may be routed through a single fitting

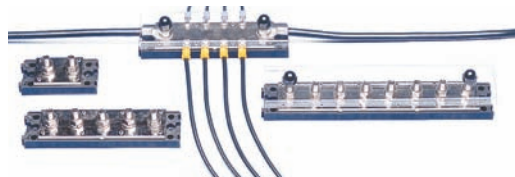
Connector Model	Drill-Thru Aperture	Max Diameter
DX-2	1.2"	1.2"
DX-3	1.65"	1.65"
DX-5*	2.0"	2.0"

*Aluminum Housing



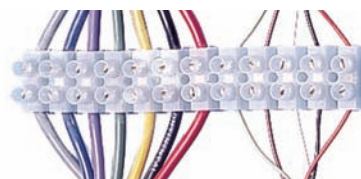
Bus Bars

- Heavy duty 500 amp nickel-plated copper bus with 5/16" studs on insulating base (reinforced nylon resin) with clear protective cover
- BB-5: 5 studs * BB-8: 8 studs
- BBA-800 - rackmount see page 15
- BB-2: 2 studs * BB-2/8: 2 studs plus 8 x # 8 screws



Connector Strips

- Molded nylon strips with 12 pair brass compression screw terminals
- May be cut to suit installation
- CS-1: 16 AWG wire, 6 amps max
- CS-2: 14 AWG wire, 10 amps max



Terminal Strips

- Nickel-plated brass strips on insulating base
- # 8 screw terminals; rated to 100 amps
- Order with or without insulating cover
- TS-2x4: 8 terminals
- TS-2x8; 16 terminals



Emergency Relay/Charger - ERC

The E.R.C. allows emergency battery tie-in to a radio system that is normally operated by a power supply.

Under normal conditions the radio is connected through the ERC to the power supply and the back-up battery receives only a trickle charge to keep it in peak condition.

In the event of AC power failure a relay automatically connects the radio to the back-up battery, restoring the system within one second. When AC power is restored the radio is automatically reconnected to the power supply and the trickle charge resumes to the battery. Available in 12 or 24 VDC, 15 or 35 Amp ratings, (not ignition protected.)



Application notes:

- 1 sec. switch over delay may not be suitable for data transceivers. Instead, use a system where the battery is floated on output of power supply - see Power-Pac (pg 22) or IPS (pg 7) or APS (pg 23).
- Trickle charge current will maintain a back-up battery but will not restore a deeply dis-charged battery. A separate high current charging source is required.

Typical Trickle Charge Current:

1.5 amps - will vary depending on power supply voltage and battery condition.

Optimal Power Supply Voltage:

- 12 volt systems: 13.4 - 14.0 VDC
- 24 volt systems: 26.8 - 28.0 VDC

ERC Model	Amps		Size-inches			Weight	
	Int.	Cont.	H	W	D	Lbs	Kg
12-15	15	10	2.25	2.875	4	1	.5
24-15	15	10	2.25	2.875	4	1	.5
12-35	35	30	3.875	2.875	4	2	.9
24-35*	35	30	3.875	2.875	4	2	.9

*Built to order



Powering the Network

Communication Accessories

Phone-Com Systems

The Phone-Com intercom system provides direct, wired, point-to-point communication, operates on 12 VDC, constructed of high-impact plastic and are available in either classic white or traditional black. Wall mounting bracket is provided. Available models: PI-2 and PI-10.

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PI-2: Designed for communication between only two points. A single call a buzzer and illuminates an indicator lamp on the companion phone. or as a set with 40' of interconnect wire, fuse, terminal lugs and mounting

PI-2 SET: Two station phone set, 40' interconnect wire, fuse, lugs, mounting hardware; 5 lbs.

PI-10: For multiple station calling capability. Up to 10 phones may be interconnected, and each phone has 10 call buttons. Sold individually--wiring requirements in the next column.

Accessories:

22 AWG Wire: 5, 10 or 15 conductor; sold per foot.

BUZZER: External buzzer for use in high-noise areas, 1 lb



AQ Series Waterproof Radio Covers

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Hand-held radios can be taken anywhere without being damaged by water, dust or sand when the AQ Series waterproof cover is used for protection. Even total immersion will not harm the radio. These covers are certified waterproof to a depth of 33 feet.

The case is made of super-tough, UV resistant PVC, which is engineered with enough flexibility to facilitate easy operation of knobs and keypads. Transparent design allows easy reading of digital displays.

Sound is virtually unimpeded and RF transmission is unaffected. A quick release clip allows easy insertion and removal of the radio and a handy lanyard provides extra security when hands are wet. But if the radio falls into deep water, no problem! Safely inside the AQ case, it will float!

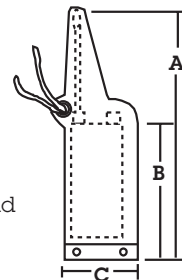
Model

AQ-10L/R For compact hand-held radios. New reversible design accommodates both left and right hand antennas; Replaces AQ-10

AQ-20L/R For standard size hand-helds. New reversible design accommodates both left and right hand antennas; Replaces AQ-20L and AQ-20R

Dimensions in inches

A=Overall height of radio/phone with antenna extended
B= Height of radio/ phone body
C=Combined width and depth of radio/phone body



Model	A	B	C
AQ-20L/R	15.7"	7.8"	5"
AQ-10L/R	13"	6.1"	4.1"

Weight (all models): 1 lb.

Indoor/Outdoor Paging Speakers

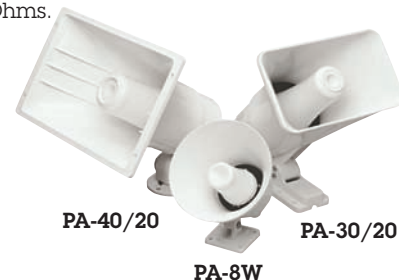
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Clear, distortion-free waterproof speakers are ideal for paging and alarm systems. Constructed of high impact plastic with stainless steel hardware. Impedance (all models) 8 Ohms.

Model	Output Nominal/Peak	Weight
PA-8W	8 watts / 12 watts	1 lb.
PA-30/20	30 watts / 20 watts	3 lbs.
PA-40/30	40 watts / 30 watts	5 lbs.
PA-60/40	60 watts / 40 watts	8 lbs.

Note: Model PA-60/40 is a commercial grade horn which also features excellent sensitivity as a microphone for use in talk-back systems.



Antenna/Coax Switches

Manual

Model: CS-201

Two position switch allows manual selection of one of two antennas with a single radio or one of 2 radios with a single antenna. Die cast aluminum case.

Power: 1.5 kW peak, 1kW continuous

Impedance: 50 ohm

Connectors: SO-239/UHF

Weight: 1Lb., .5Kg.



Remote

Model: RCS

Operates on 12 VDC, single pole, double throw. Permits remote selection of two antennas with a single radio.

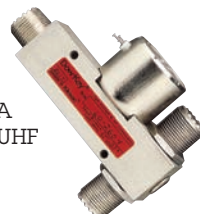
Power: 1Kw.

Impedance: 48 ohm

Coil Current: 250 m A

Connectors: SO-239/UHF

Weight: 1 Lb., .5 Kg.



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Microphone Clips

All stainless steel. For securing standard VHF microphone when not in use. Lift to release.



Model: Spring Clip

NEWMAR

Powering the Network



Powering The NetworkSM

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