NEWMAR®

Powering the Network℠

Microwave • Broadband • Cellular • Land Mobile

- Remote Site Monitoring
- Battery Chargers
- DC Converters

- DC Power Systems
- Rectifiers
- Power Supplies
- Inverter-Chargers

- Mobile DC UPS
- Distribution Panels
- Batteries & Accessories

2013 - 2014

Powering The Network Solutions

AC-DC

Voltage/Power Range:
120/240 VAC Input 12, 24, 48, or 110 VDC Output 150 Watts - 14 kW
Components: Rectifiers, Battery Chargers, Power Modules, Power Supplies, Power Management, Rack Mount, Wall Mount, Desktop
Systems: Hot Swap Rectifiers Shelves with Distribution and Monitoring
Power Plants: Rack Mount Systems with Batteries

DC-DC

Voltage/Power Range:
12, 24, 48, 72, 110 VDC Input 12, 24, 48 VDC Output
Configurations:
Isolated/Non-Isolated, Step-Up, Step-Down, Stabilizers, Battery Charger, Rack Mount, Mobile, Wall Mount, Desktop

DC-AC

Voltage/Power Range:
12, 24, or 48 VDC Input 120/240 VAC Output 1000 - 5000 Watts
Configurations: Rack Mount, Wall Mount, Mobile

DC Power Distribution

Voltage/Power Range:
12, 24, or 48 VDC Input 200 - 900 Amp VDC Output **Configurations:** Rack Mount

DC UPS

Voltage/Power Range
12,24 VDC Input / Output 5-20 amps
Configurations: Mobile Mount

Battery Chargers

Voltage/Power Range
120/240 VAC Input, 12,24,110 VDC Output
Configurations: Wall Mount, Mobile Mount

Monitoring/Control

Remote and Local Monitoring; DC Voltage, AC Voltage, Alarms, Batteries, Security, Cameras
Remote Control of DC and AC Equipment


Hot Swap Rectifiers


Power Modules


Power Plants


Power Management


DC-DC Converters

Inverter-Chargers


Inverters


DC Distribution Panels


Battery Chargers

DC UPS

Site Monitor & Control

NEWMAR
Powering the Network

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Powering the Network

DC Power Systems

AC-DC

Voltage/Power Range: 120/240 VAC Input
12, 24, 48, or 110 VDC Output
150 Watts - 14 kW

Components: Rectifiers, Battery Chargers, Power Modules, Power Supplies, Rack Mount, Wall Mount

Systems: Hot Swap Rectifiers Shelves with Distribution and Monitoring

Integrated Assemblies: Rack Mount Systems with atteries

Rack Mount Hot Swap Rectifiers

Unity
Input: 115/230 VAC
Output: 24 or 48 VDC,
150 - 450 Watts
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Sentinel
Input: 115/230 VAC
Output: 48 VDC,
600 - 1800 Watts
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Centurion II
Input: 115/230 VAC
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Commander
Input: 115/230 VAC
Output: 48 VDC,
6kW - 14kW
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Guardian
Input: 115/230 VAC
Output: 110 VDC,
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Gladiator
Input: 115/230 VAC
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DC Power Systems

Modular Power System

PM System
Input: 115/230 VAC
Output: 12, 24, or 48 VDC,
560 - 2200 Watts
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Self Contained Power System

Integrated Power System with Internal Batteries
Input: 115/230 VAC
Output: 12, 24, or 48V,
500 Watts
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Power Plants

RPS System
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Wall Mount System

Site Power System
Input: 115/230 VAC
Output: 12, 24, or 48V,
250 - 500 Watts
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Sentinel Power System

Incredible Functionality in a 1 RU DC Power System, 600 to 1800 Watts

- 19", 1U rackmount shelf with integrated power distribution and SNMP digital controller
- 90-250 VAC input, power factor corrected, no derating at 120V input
- 3 power bays accept 600 watt modular rectifiers, -48V
- 33 amp, 1800 watt total output capacity
- Output temperature compensated for precise battery charging
- 4 DC circuit breaker distribution capacity, with tripped breaker alarm
- Master disconnect breaker for two battery banks, with tripped breaker alarm
- Controller with digital display of system parameters with TCP/IP interface and SNMP monitoring and logging
- Alarm contacts monitor system functions
- Low voltage disconnect built-in
- Easily configures to meet site power requirments

Complete system design and assembly to your application parameters: Rectifier configuration, distribution circuit breaker installation, and programming of alarms and monitors. Installation in a relay rack with batteries and wiring also available.

Watts Per Rectifier	System Power Configurations @ 48V, 90 - 300 VAC Input # of Rectifiers Installed		
	1	2	3
600	11A (600W)	22A (1200W)	33A (1800W)

NEWMAR Powering the Network

Specifications

AC Input

Nominal: 115 or 230V

Voltage Range: 90-300V

Frequency Range: 45-65 Hz

Power Factor: >0.99

Efficiency: >92% (from 50% output power)

DC Output

Voltage: -48 volt

Output Ratings: Constant power output from 54V to 58V

Nominal Voltage: 48V

Rated Voltage: 58V

Power:

Rated maximum System Output Power: 1800W @ 54V

Individual Rectifier Power: (48 volt) 600 watt

Amperage @155 or 230 vac in 4.2

DC Distribution:

Load: 4 breaker positon capacity, available amperages (specify) 6A, 10A, 20A,
Battery: 30A, with tripped breaker alarm 2 x 30A battery circuit breakers.

Breaker Fail Detection: Electronic fail detection on both load and battery. Breakers

Low Voltage Battery Disconnect: 80A battery LVD installed standard, with disconnect alarm

Monitoring & Control:

Monitors all power system conditions including DC voltage, rectifier current, battery current, battery temperature, and distribution failure. Visual notification of alarm conditions by LED's and a 4 line x 16 character alpha numeric display mounted on the front panel, with remote notification being enabled by relay contacts, RS232 or TCP/IP (using SNMP). It has a built-in web based configurator allowing setup of system parameters using a web browser and utilizes a USB communications port which allows for local monitoring of system operations as well as easy downloading of configuration files for multiple site installations.

General System

Protection:

Current Limit: Adjustable to 50-100% of maximum rated current.

Over Temperature: Automatic current reduction, backup shutdown protection.

Polarity Reversal: Output fuse with crowbar diode
Over Voltage: Adjustable limit.

Input Voltage: Auto shutdown, auto restart when correct voltage restored.

Input Inrush: <2x maximum input current.

Input Fuses: In phase and neutral.

Technical Characteristics:

Noise: Ripple <100Hz: <1mV rms unweighted

Voice band 100Hz-5KHz: <2mV rms psophometric

Wide band 5kHz-1MHz: <5mV rms unweighted

Peak to Peak 0-20MHz: <50mV peak to peak

Isolation: Input to Output: 4000V DC.

Input to Chassis: 3500V DC (VDR to chassis removed)

Output to Chassis: 2100V DC

Regulation: Line = ±0.1%, Load = ±0.5%
(no load to full load)

Mechanical

Shelf: Dimensions 19" W x 1.75" H x 10.2" D

Weight: 19.84 Lbs. (excluding rectifier modules)

Rectifers: Dimensions 2.2" W x 1.7" W x 9.25" D

Weight: 1.7 Lbs

Cooling: Forced cooled.

Environmental

Ambient Temperature: Range: -20° to +70° C, Derating above 50° C

Range: -20° C to +70° C (maximum output power is derated above +50° C)

Storage: -20° C to **+70º C**

Humidity: 0-98% RH (non-condensing)

Altitude: <8,202 ft., De-rate max. ambient temperature by 4° C per 3,280 ft. above sea level.

Compliances

Safety: EN60950

Electrostatic Discharge: CISPR24

Radiated Radio Freq: CISPR22

AC Harmonics: EN61000-3-2

AC Flicker & Fluctuation: EN61000-3-3

Other: CE & RoHS compliant

Centurion II Power System

Incredible Functionality, Flexibility, and Scalability in a 2 RU DC Power System, 1.0 to 6.0 Kw

- 19", 2U rackmount shelf with integrated power distribution
- 90-250 VAC input, Power Factor Corrected
- 3 power bays accept 1000 or 2000 watt modular rectifiers
- 111 amp, 6000 watt total max. output capacity, (74 Amp, 4000 Watt, N+1) @ -48 or 24 VDC
- Output temperature compensated for precise battery charging
- 16 DC circuit breaker distribution capacity, with tripped breaker alarm
- Master disconnect breakers for two battery banks, with tripped breaker alarm
- Controller with digital display of system parameters with TCP/IP interface and SNMP monitoring/ logging
- Alarm contacts monitor major system functions
- Low voltage disconnect built in
- Easily configures to meet site power requirements

Complete system design and assembly to your application parameters: Rectifier configuration, distribution circuit breaker installation, and programming of alarms and monitors. Installation in a relay rack with batteries and wiring also available.

System Power Configurations @ 48V* (220 VAC Input)			
Watts Per Rectifier	# of Rectifiers Installed		
	1	2	3
2000	37A (2000W)	74A (4000W)	111A (6000W)
1000	18A (1000W)	36A (2000W)	54A (3000W)

System Power Configurations @ 24V*			
2000 †	37A (2000W)	74A (4000W)	111A (6000W)

** @ 120 VAC: Derate 2 kW rectifiers 41%; 1 kW rectifiers 33%*

Powering the Network

Centurion II Power System

Specifications

AC Input

Nominal: 230V

Voltage Range: 90-300V (derate @ 115 input)

Frequency: Range: 45-65 Hz

Power Factor: >0.99

Efficiency: >94% (from 30-95% output power)

DC Output

Voltage	-48 volt	+24 volt
	Constant power	Constant power
Output Ratings:	48V to 58V	24V to 29V
Nominal Voltage:	48V	24V
Rated Voltage:	58V	29V

Power:

Rated maximum System Output Power:

6000W @ -48V, 3000 watts @ 24 volts

Individual Rectifier Power: (24 and 48 volt)

	1000 watt	2000 watt †
Amperage @ 230 vac in	18	37
Amperage @ 115 vac in	12	21

† Model C2R-2000 is rated for 1,000W or 37 amps at 24 volts

DC Distribution:

Load: 16 breaker positon capacity, available amperages 6A, 10A, 15A, 20A, 30A, with alarm

Battery: 2 x 100A battery circuit breakers.

Breaker Fail Detection: Electronic fail detection on both load and battery breakers

Low Voltage Battery Disconnect:125A battery LVD installed standard, with disconnect alarm

Monitoring & Control:

Monitors all power system conditions including DC voltage, rectifier current, battery current, battery temperature, and distribution failure. Visual notification of alarm conditions by LED's and a 4 line x 16 character alpha numeric display mounted on the front panel, with remote notification being enabled by relay contacts, RS232 or TCP/IP (using SNMP). It has a built-in web based configurator allowing setup of system parameters using a web browser and utilizes a USB communications port which allows for local monitoring of system operations as well as easy downloading of configuration files for multiple site installations.

General System

Protection:

Current Limit: Adjustable to 50-100% of maximum rated current.

Over Temperature: Automatic current reduction, backup shutdown protection.

Polarity Reversal: Output fuse with crowbar diode

Over Voltage: Adjustable limit.

Input Voltage: Auto shutdown, auto restart when correct voltage restored.

Input Inrush: <2x maximum input current.

Input Fuses: In phase and neutral.

Technical Characteristics:

Noise: Ripple <100Hz: <1mV rms unweighted

Voice band 100Hz-5KHz: <1mV rms psophometric

Wide band 5kHz-1MHz: <5mV rms unweighted

Peak to Peak 0-20MHz: <100mV peak to peak

Isolation: Input to Output: 4000V DC.

Input to Chassis: 3500V DC
(VDR to chassis removed)

Output to Chassis: 2100V DC

Regulation: Line = ±0.1%, Load = ±0.5%
(no load to full load)

Mechanical

Shelf: Dimensions 19" W x 3.5" H x 15.35" D

Weight: 19.84 Lbs. (excluding rectifier modules)

Rectifers: Dimensions 4.25" W x 2.75" W x 11.1" D

Weight: 3.15 Lbs

Cooling: Forced cooled.

Compliances

Safety: EN60950

Electrostatic Discharge: CISPR24

Radiated Radio Freq: CISPR22

AC Harmonics: EN61000-3-2

AC Flicker & Fluctuation: EN61000-3-3

Other: CE & RoHS compliant

Commander Power System

Incredible Functionality, Flexibility, and Scalability in a 5 RU DC Power System, 1.0 to 14.0 Kw

- 19", 5U rackmount shelf with integrated power distribution
- 90-250 VAC input, Power Factor Corrected
- 7 power bays accept 1000 or 2000 watt modular rectifiers
- 259 amp, 14,000 watt total max. output capacity, (222 Amp, 2,000 Watt, N+1) @ - 54 VDC
- Output temperature compensated for precise battery charging
- 18 DC circuit breaker distribution capacity, with tripped breaker alarm
- Distribution breaker rating up to 63 amps
- Master disconnect breakers for four battery banks, with tripped breaker alarm
- Controller with digital display of system parameters with TCP/IP interface and SNMP monitoring/logging
- Alarm contacts monitor major system functions
- Low voltage disconnect built in
- Easily configures to meet site power requirements

Complete system design and integration by Newmar to your application parameters: Rectifier configuration, distribution circuit breakers installation, and configuration of alarms and monitors. Assembly in a relay rack with batteries and wiring also available. Let us submit a proposal on your next project.

Watts Per Rectifier	System Power Configurations @ 48V* (220 VAC Input) # of Rectifiers Installed						
	1	2	3	4	5	6	7
2000	37A (2,000W)	74A (4,000W)	111A (6,000W)	148A (8,000W)	185A (10,000W)	222A (12,000W)	259A (14,000W)

** @ 120 VAC: Derate 2 kW rectifiers 41%; 1 kW rectifiers 33%*

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Commander Power System

Specifications

AC Input

Nominal: 230V

Voltage Range: 90-300V (derate @ 115 input)

Wiring Options: 1) Single 208-240VAC, 3 phase, 4 wire WYE ('Y') input or 2) 3 x separate 208-240VAC, 2 wire inputs

Frequency Range: 45-65 Hz

Power Factor: >0.99

Efficiency: >94% (from 30-95% output power)

DC Output

Voltage: -48 volt

Output Ratings: Constant power output from 54V to 58V

Nominal Voltage: 48V

Rated Voltage: 58V

Power:

Rated maximum System Output Power: 14,000W @ -48V

Individual Rectifier Power: (48 volt)	**2000 watt**
Amperage @ 230 VAC in	37
Amperage @ 115 VAC in	21

DC Distribution:

Load: 18 breaker positon capacity, available amperages (specify) 6A, 10A, 16A, 20A, 25A, 32A, 40A, 50A, 63A with tripped breaker alarm

Battery: 4 x 100A battery circuit breakers.

Breaker Fail Detection: Electronic fail detection on both load and battery breakers

Low Voltage Battery Disconnect: 300A battery LVD installed standard, with disconnect alarm

Monitoring & Control:

Monitors all power system conditions including DC voltage, rectifier current, battery current, battery temperature, and distribution failure. Visual notification of alarm conditions by LED's and a 4 line x 16 character alpha numeric display mounted on the front panel, with remote notification being enabled by relay contacts, RS232 or TCP/IP (using SNMP). It has a built-in web based configurator allowing setup of system parameters using a web browser and utilizes a USB communications port which allows for local monitoring of system operations as well as easy downloading of configuration files for multiple site installations.

General System

Protection:

Current Limit: Adjustable to 50-100% of maximum rated current.

Over Temperature: Automatic current reduction, backup shutdown protection.

Polarity Reversal: Output fuse with crowbar diode

Over Voltage: Adjustable limit.

Input Voltage: Auto shutdown, auto restart when correct voltage restored.

Input Inrush: <2x maximum input current.

Input Fuses: In phase and neutral.

Technical Characteristics:

Noise: Ripple <100Hz: <1mV rms unweighted

Voice band 100Hz-5KHz: <1mV rms psophometric

Wide band 5kHz-1MHz: <5mV rms unweighted

Peak to Peak 0-20MHz: <100mV peak to peak

Isolation: Input to Output: 4000V DC.

Input to Chassis: 3500V DC (VDR to chassis removed)

Output to Chassis: 2100V DC

Regulation: Line = ±0.1%, Load = ±0.5% (no load to full load)

Mechanical

Shelf: Dimensions: 19" W x 8.75" H x 15.35" D

Weight: 35.15 Lbs. (excluding rectifier modules)

Rectifers: Dimensions: 4.25" W x 2.75" W x 11.1" D

Weight: 3.15 Lbs

Cooling: Forced cooled.

Environmental

Ambient Temperature: Nominal: 25+/-5° C

Range: -10° C to +70° C (maximum output power is derated above +50° C)

Humidity: -5-95% RH (non-condensing)

Altitude: <8,202 ft., De-rate max. ambient temperature by 4° C per 3,280 ft. above sea level.

Compliances

Safety: EN60950

Electrostatic Discharge: CISPR24

Radiated Radio Freq: CISPR22

AC Harmonics: EN61000-3-2

AC Flicker & Fluctuation: EN61000-3-3

Other: CE & RoHS compliant

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. An optional monitor panel with LVD and battery disconnect breaker provides system status and control.

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
- Optional GMT fuse panel: Five positions, easy rear panel wiring to loads, fuse access at front
- Optional voltage monitor and LVD panel

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 Fuse Capacity	Total Current Capacity	Size	Weight
UFP-5	-48 or +24 VDC	5	20A	1 RU	1 lbs.

Optional System Component

Unity Low Voltage Disconnect & Monitor

Digital battery monitor and alarm panel with Low Voltage Disconnect integrates with the Unity rack mount shelf into a highly functional power system. Built-in features include: LVD, digital monitor of voltage and amperage, battery disconnect breaker and alarm contacts. The digital display monitors bus voltage, battery voltage, system output current and low voltage connect/disconnect set points. See model ULM-100, page **71** for complete specs.

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Unity Rectifier System

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)

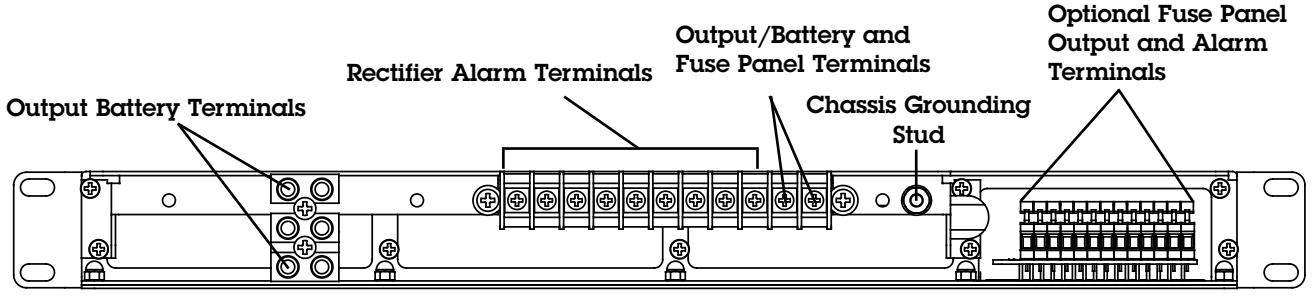
Current: 20 amps max. total

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

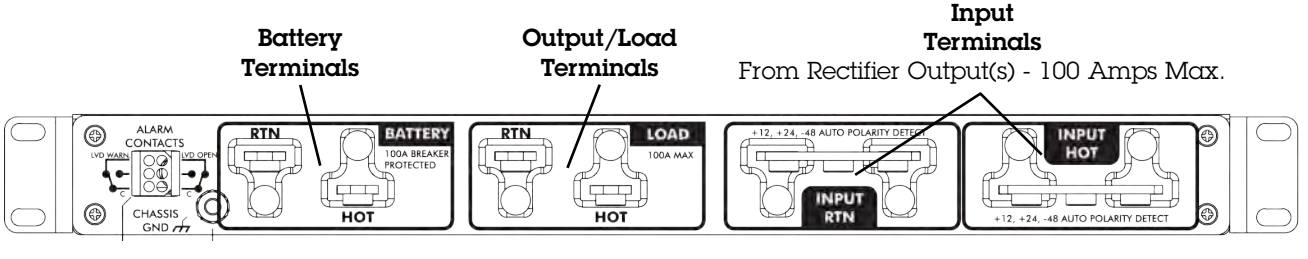
Available Amperages: 1, 3, 5, 7.5, 10, 15 Amps

Alarms/Indicators: Output failure summary alarm contacts; Form C Front panel blown fuse summary LED indicator

Unity Shelf Rear Panel Diagram



Unity Low Voltage Disconnect & Monitor Rear Panel Diagram (see Model ULM-100 page 71)



Powering the Network

RPS Power Systems

RPS Rack Power Systems feature PM Series rectifiers and PFM Controller.

Our engineering team offers comprehensive system integration services, including consultation, configuration, manufacturiing, assembly, test, and delivery of fully integrated and functional power plants. We provide rapid delivery of complete systems, precisely tailored to meet your site requirements. See opposite page for basic menu of components offered in configuring your system.

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
- Hot swap and hot standby configuration
- Co-location compatibility
- Fault tolerance/redundancy
- Back-up battery run time calculations
- Power distribution requirements
- Remote monitoring and alarming

Engineering and Configuration

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.

Shipment

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

Aftersale Support

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

Contact Jeff Wright at **jeffw@newmarpower.com** to discuss your requirements.

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RPS Power System Components

Select from the following components to configure your system.

	Power Modules						
	Quantity Installed	Total Amps	N+1 Amps		Quantity Installed	Total Amps	N+1 Amps
12 Volt				**24 Volt**			
PM-12-40	2	40	40	**PM-24-20**	2	22	20
	3	72	40		3	36	20
	4	108	40		4	54	20
	5	180	40		5	72	20
	6	216	40		6	90	20
PM-12-80	2	80	80	**PM-24-35**	2	35	35
	3	144	80		3	63	35
	4	288	80		4	94.5	35
	5	360	80		5	126	35
	6	432	80		6	157.5	35

48 Volt			
PM-48-20	2	20	20
	3	36	20
	4	54	20
	5	72	20
	6	90	20
PM-24-50	2	50	50
	3	90	50
	4	135	50

Power Module
See page 24 for specifications

Power Function Manager - PFM-400

Provided Functions:

- Low Voltage Disconnect
- Metering
- Rectifiers and Battery Tie Points
- Distribution circuit breakers

See page 26 for specifications

Options

Additional Distribution Panel:

- DST-10A
- DST-20A
- DST-FB

Power Distribution
See page 58, 60 for specifications

Batteries & Accessories

- Front Terminals Batteries - page **49**
- Battery Disconnect Panels - page **83**
- Battery Trays - page **84**

Remote Monitoring

- Site Power Monitor
- Site Monitor and Control

Remote Monitoring
See page 65 for specifications

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Integrated Power Systems

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.

A precision regulated power supply/charger, back-up battery, low voltage battery disconnect, output metering, LED status and Form C alarm contacts are all pre-wired and calibrated within the unit for plug-and-play operation. Plug-in terminals are provided for easy wiring of an additional parallel rectifier input, or external batteries for increased back-up capacity.

The batteries are always in-line with the load, thus there is no interruption from relays or transfer switches in the event of AC loss. Batteries are recharged when AC is restored. A manual battery disconnect switch allows internal or external battery service or replacement while the system is running. Models available for -48, +24 and +12 volt applications.

Features

- Precision regulated power supply simultaneously maintains batteries at peak charge and supplies system load
- Built-in, sealed, maintenance free, lead acid batteries instantly power load during AC failure--no switch-over delay. 3-5 year average life. Terminals provided for additional external batteries for increased back-up capacity
- Terminals provided for easy addition of parallel rectifier. (48V and 24V models only)
- Low voltage battery disconnect, automatic or manual setting
- Numerous front panel monitors--L.E.D. status indicators and digital ammeter/voltmeter
- Form C summary failure alarm contacts; loss of internal rectifier output, loss of external rectifier output, LVBD contactor open. AC input failure alarm contacts optional
- Numerous protection features--AC input breaker, internal battery breaker, auto thermal shutdown/ recovery, current-limiting, short-circuit and over-voltage protection
- 19" rack, 6" forward rackmount brackets provided

Model	Input Amps @ Full Load 115 / 230	Output VDC	Output Adjustment Range	Output Amps Continuous	Output Supplemental Input Port*	Internal Battery Capacity	Ground Reference
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

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Powering the Network

Integrated Power Systems

Specifications

AC Input

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

Frequency: 47-63 Hz

DC Output

Voltage/Amperage: See model matrix

Maximum Load with External Rectifier and Battery Inputs: 40A
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 Disconnect

Form C Alarm Contacts:

- Summary Failure
- AC Input Failure (Optional)

Options

AC Input Fail Contacts:
Specify 115 or 230 VAC

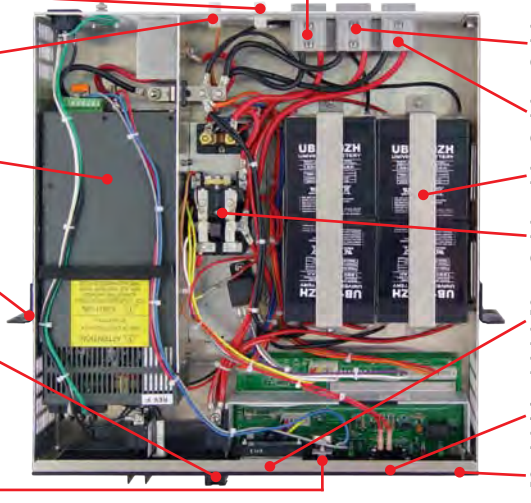
Rectifier/Battery Input Cable Assembly: (Model CA-24)

Rear Support Bracket for Flush Mounting Models: RSB-19

Distribution Panel Models:
DST-10 (UL), DST-20A (UL)

Unit Supplied Without Batteries

Top View with Cover Off



Internal Battery
Constat Current Performance (Amps) to 1.75 VPC

Model	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

NEWMAR

Powering the Network

Now Available in Higher Power

Site Power System

The Site Power System (SPS) series provides a complete DC power solution that integrates quickly with batteries, loads, and monitors. Available in 12, 24 and -48 volt, 300 and 475 watt configurations, the compact assembly contains: power supply with temperature compensated, automatic boost/float battery charge cycle; low voltage disconnect; and programmable alarm contacts. High operating temperature rating with convection cooling make the unit ideal for remote site shelters, railroad wayside bungalows, and pole mount enclosure applications, as well as private network base stations and microwave sites.

Features

- Well regulated noise free output - no interference with sensitive electronic loads
- Separate Battery Charger output with remote temperature compensation sensor
- Automatic Boost voltage output after AC power failure quickly recovers battery
- Low voltage disconnect protects batteries from over discharge
- Output current indicator LEDs
- Wide temperature operating range (-40 to +70° C), convection cooled, meets AREMA standards
- Alarm contacts interface with remote monitor systems

Models	Voltage Range	Voltage Adjustment Range	Output Amps
SPS 12-20	13.6V	11-15V	20
SPS 12-35*	13.6V	11-15V	35
SPS 24-10	27.2V	22-30V	10
SPS 24-20*	27.2V	22-30V	20
SPS 48-6	54V	44-60V	6
SPS 24-12*	54V	44-60V	12

** New models, contact factory for availability*

Specifications: SPS Series

AC Input

Nominal: 110/220V, 50/60Hz

Voltage Range: 100-275V AC (full power output), 85-100V AC (reduced power output)

Frequency Range: 45-66Hz

Power Factor/Efficiency: >0.99 (full load)/87%

Input Fuses: Fuses in phase & neutral

Maximum Input Current: 300W Models: 4A
475W Models: 6A

Protection

Input Voltage: Automatic shutdown, restarts automatically when correct voltage restored.

Input Rush: <2x maximum input current.

Mechanical

Size: 12.25" W x 5.75" H x 2.45" D, (311mm x 146mm x 62mm)

Weight: 3.4 Lbs./1.5 Kg.

NEWMAR Powering the Network

Site Power System

Specifications cont.

Protection

Redundancy/Scalability: Ok to wire in parallel, active load sharing

Temperature Compensation: Output voltage slope adjustable 0.1 to 0.2%/°C; 3' cable with battery lug sensor provided Safeguards: Reverts to default voltage if sensor wire becomes short or open. High voltage limit under extreme low temperature conditions

Regulation Line/Load: ±0.1%/±0.5% (no load to full load)

Hold-up Time: >15ms for 20% output voltage drop.

Start-up Time: Walk-in delay 2 seconds (depends on AC input voltage)

Protection

Current Limit: Adjustable to 50-100% of maximum rated current

Over Temp: Automatic current turndown, backup shutdown protection

Polarity Reversal: Output fuse with crowbar diode

Over Voltage: Adjustable limit

Noise: (under nominal conditions)

Ripple: <100Hz: <5mV rms

Voice Band 100Hz to 5KHz: <1mV rms psophometric

Wide Band 5kHz to 1 MHz: <5mV rms

Peak to Peak 0 to 20MHz: <50mV p-p

Isolation

Input to Output: 4,200V DC

Input to Chassis: 3,500V DC (VDR to chassis removed.)

Output to Chassis: 2,100V DC

Environmental

Cooling: Convection cooled

Range: -40° to +70°C operating range; -10° to +60° @ 100% load rating. derate to 20% load below -10° C and above +60° C

Humidity: 5-95% RH (non-condensing)

Altitude: <7500m de-rate maximum ambient temperature by +4° C per 3000m above sea level

Mechanical

Case: Painted Aluminum

Mounting: Wall or enclosure back plane, vertical orientation

Dimensions: 12.25" W x 6.40" H x 2.45" D; (311mm x 163mm x 62mm)

Weight: 3.4 lbs.;1.5kg

Connections:

AC: IEC 320 universal connection, 3 foot power cord provided, NEMA 5-15

Output to Load & Batteries: 4 way lumberg macromodule, screw style

Temperature Sensor: 2 way lumberg macromodule, (pre-installed on 6 foot cable)

Monitor Connection: RJ45

Standard Features

Output Current Indicator: Ten segment red LED "dot" display

Auto Float/Boost: Rectifier enters boost mode at power up. When battery current reduces to float threshold limit (adjustable from 0.1A to 40% MRC), unit reverts to float voltage. When in boost but out of current limit, rectifier automatically switches to float after four hours. If battery current exceeds float threshold when rectifier in float mode, it automatically switches to boost mode.

Alarm and Indicator Controls: Positive V out, Load share signal (in/out), External shutdown, Open collector 'off normal' alarm (OSVD, over temp. limit), LVD synchronisation signal (in/out) Temperature compensation input signal, Open collector rectifier fail (via 4k7 resistor), Open collector mains fail, Negative V out.

Internal Alarm Card: 4x N.O or N.C (selectable) relay contacts with single common for rectifier fail, off normal, float low, float high. 1x VF changeover relay contact for mains fail. Relay contacts rated at 100V DC 1A. Connections via "mini combicon" connector accepts 16 AWG (1.5mm diameter) wire.

LED Indicators:
Green - AC on. (primary converter operating) Green - Temperature probe connected and within normal limits.
Red - Rectifier 'failed'.
Green - Rectifier in 'float' mode.
Yellow - Rectifier in 'boost' mode.
Yellow - Rectifier in 'current' limit.
Red - Rectifier 'off normal'.

Internal Adjustments:

Float voltage, Boost voltage, Over voltage shut down, Current limit, Temperature compensation slope, Auto boost to float threshold limit, Load disconnect voltage, Load disconnect hysteresis voltage

Design Standards

EN60950,

Electrostatic Discharge: CISPR24,
Radiated Radio Frequency: CISPR22, AC
Harmonics: EN61000-3-2, AC
Flicker and Fluctuation: EN61000-3-3, CE MTBF 358,540 Hours, calculated to Telcordia Standards

** New models, contact factory for availability.*

Low Voltage Disconnect:	SPS 12-XX	SPS 24-XX	SPS 48-XX
Voltage Adjustment Range:	10-12V	19-24V	39-48V

Guardian: 110VDC, 3 - 6 kW

NEW

The Guardian is a high voltage industrial power system with power output to 6.0 kW (50 amps) @ 120 VDC and is an ideal battery charging solution for utility protection and control equipment.

Featuring high frequency switch mode rectifier modules, intelligent network capable controllers, load and battery distribution breakers and, AC input isolation and surge suppression, all in a compact 2U, 19" rack mountable power shelf.

Features

- Fully featured industrial rectifiers
- Network monitoring available
- Earth leakage detection
- Built-in AC surge suppression
- Battery and load breakers
- Hot swappable rectifiers provide N+1 redundancy
- Easily customized and configured to suit site requirements
- Modular 19" design for ease of installation

Watts Per Rectifier	# of Rectifiers Installed	
	1	2
3000	25A (3000W)	50A (6000W)

Specifications

Electrical

AC Input: Single phase, 90 - 300 VAC, 45 - 66 Hz.

Power Factor: .0.99 (full load)

DC Output: 120V

Rated Voltage: 80 - 155V

Rated System Output Power: 6.0kW max. @ 121.5 VDC (50A)

DC Distribution:

Load: 1x 63A, 2 pole load breakers

Battery: 1x 125A, 2 pole battery breaker

Breaker Trip Detection: Auxiliary alarms on both load and battery breakers

Monitoring and Control

Various monitoring options are available via the supervisory modules. Standard features include full temperature compensation, automated and manual battery testing/equalization and three voltage-free relay alarm outputs.

Mechanical

Dimensions: 19" W x 3.5" (2U) W x 16.3" D

Weight: 16.5 Lbs. (excluding rectifier modules)

Preliminary product announcement, contact factory or see website for more information.

NEWMAR

Powering the Network

Gladiator: 110VDC, 3 - 12 Kw

NEW

The Gladiator high voltage industrial power system with power output of up to 12.0 kW (100 amps) @ 120 VDC is an ideal battery charging solution for utility protection and control equipment.

Featuring high frequency switch mode rectifier modules, intelligent network capable controllers, load and battery distribution breakers, and AC input isolation and surge suppression, all in a compact 5U, 19" rack mountable power shelf.

Features

- Fully featured industrial rectifiers
- Network monitoring available
- Earth leakage detection
- Built-in AC surge suppression
- Battery and load breakers
- Hot swappable rectifiers provide N+1 redundancy
- Easily customized and configured to suit site requirements
- Modular 19" design for ease of installation

Watts Per Rectifier	# of Rectifiers Installed			
	1	2	3	4
3000	25A (3000W)	50A (6000W)	75A (9000W)	100A (12000W)

Specifications

Electrical

AC Input: Three phase or single phase
90 - 300 VAC, 45 - 63 Hz.

Max. Input Current: 76A

Protection:

Input Voltage: Auto Shutdown, auto restart when correct voltage restored

Input Inrush: 2x maximum input current

DC Output:

Nominal Voltage: 120V

Voltage Range: 80 - 155V

Maximum Current: 100A (25A per module)

DC Distribution:

Load: 3 x 63A, 2 pole load breakers

Battery: 1 x 125A, 2 pole battery breaker

Monitoring and Control

Interface Display: 4 line x 16 character multi-lingual, alpha-numeric

Controls: 3x push buttons for parameter setting or viewing on front panel

Communications:

Serial: 1x USB port on front panel for local PC interface

Relay: 3x alarm and control relays

TCP/IP: Ethernet interface for communication using SNMP protocol

Mechanical

Dimensions: 19" W x 8.75" (5U) W x 12.6" D

Weight: 20 Lbs. without rectifiers

Preliminary product announcement, contact factory or see website for more information.

NEWMAR

Powering the Network

Power Plants

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.

Our engineering team offers comprehensive system integration services, including consultation, configuration, manufacturiing, assembly, test, and delivery of fully integrated and functional power plants. We provide rapid delivery of complete systems, precisely tailored to meet your site requirements. See opposite page for basic menu of components offered in configuring your system.

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
- Hot swap and hot standby configuration
- Co-location compatibility
- Fault tolerance/redundancy
- Back-up battery run time calculation
- Power distribution requirements
- Remote monitoring and alarming

Engineering and Configuration

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.

Shipment

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

Aftersale Support

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

Contact Jeff Wright at **jeffw@newmarpower.com** to discuss your requirements.

Power Plants

Components

Modular Rectifiers

Page 24

Hot Swap Rectifiers

Pages 4 - 11

Site Power Monitor

Page 66

Power Management System

Pages 26, 71

Distribution Panels

Pages 58 - 61

DC-DC Converters

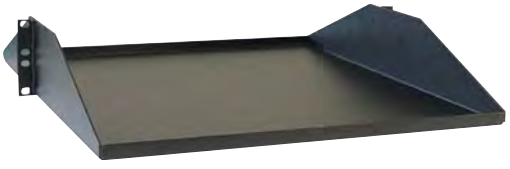
Page 34

DC-AC Inverters

Page 42

Fuse Panel

Page 62



Battery Tray

Page 84

Batteries

Page 48

Rectifiers - Power Supplies

AC-DC

Voltage/Power

120/240 VAC Input
12, 24, 48 VDC Output
150-1000 Watts

Components:

Rectifiers
Battery Chargers
Power Modules
Power Management
Power Supplies

Configurations:

Rack Mount
Wall Mount
Desktop

Rectifiers - Power Supplies

Rack Mount Rectifiers and Management Components

Power Module
Input: 120/230 VAC
Output: 12, 24 or 48 VDC,
560 - 2200 Watts
Page 24

PFM-400
Input: 12, 24 or 48 VDC
Total Current Capacity: 400A
Page 26

Integrated Power System with Internal Batteries
Input: 115/230 VAC
Output: 12, 24 or 48 VDC,
11 - 40 Amps with Internal Battery
Page 28

Mobile, Wall Mount, and Desktop Power Supplies

Heavy Duty Power Series
Input: 115/230 VAC
Output: 12 ro 24 VDC,
5 - 35 Amps
Page 30

Power-Pac Series
Input: 115/230 VAC
Output: 12 VDC, 5 Amps
Battery Back-up: 7 - 14 A/H
Page 32

USAR Series
Input: 115/230 VAC
Output: 24 or 48 VDC
3 - 6 Amps, 150 Watts
Page 32

Site Power System
Input: 115/230 VAC
Output: 12, 24, or 48 VDC,
250 - 500 Watts
Page 16

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 RPS System **page 12** 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)
- Optional battery charging circuit: three-step charging, gel/lead-acid switch, and temperature compensation
- Form C alarm contacts
- 19" or 23", 2 RU, flush or 6" forward rackmount

Power Modules integrated in complete system, see page 26 for details

Model	Input Amps @ Full Load 115/230V	Output VDC V Out	Output VDC V2	Output Amps Cont.+	Watts	Weight Lbs	Weight Kg.
PM-12-40A	8.5/4.3	13.6	14.3	40	560	12.2	5.5
PM-12-80	16/8	13.6	—	80	1000	15.2	6.9
PM-24-20	8.5/4.3	27.2	27.9	20	560	12.2	5.5
PM-24-40	16/8	27.2	—	40	1000	15.2	6.9
PM-48-10	8.5/4.3	54.4	55.1	10	560	12.2	5.5
PM-48-20	16/8	54.4	—	20	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*
VDC (V2) Measured at direct output terminal
+ For parallel configuration/load sharing derate output 10%

Power Modules

Performance Specifications

Input:

- 85 - 135/170-270 VAC (selectable), 47 - 63 Hz., 560 watt models
- 90 - 265 VAC, 1000 watt models
- 207 - 253 VAC, 2200 watt model

Power Factor: 0.7, 560W & 2200W models
0.98, 1000W models
Regulation: ± 1% at direct output (V2);
± 2% through "oring" diode (V out)

Ripple: 1% (Typical)
Efficiency: 80-85% @ full load
Front panel Output Voltage Adjustment Pot Range: ±10%
Altitude Range: Full output to 5,000 feet. Derate output current 4% per 1,000 feet to 10,000 feet max.

Temperature Rating

560 watt models: -40° C to +60° C;
Derate linearly from 100% load @ 50° C to 75% @ 60° C
1000 watt models: -20° C to + 70° C;
Derate linearly from 100% load @ 50° C to 50% @ 70° C
2200 watt model: 0 - 50° C

Mechanical/General

- Powder coated aluminum front panel and cover
- Vinyl laminated base and cover
- 19" Rackmount brackets provided
- Wallmount via optional brackets
- AC Input wiring:
  - 560 watt units: IEC AC entry, 6' IEC cord with NEMA 5-15 plug provided
  - 1000 watt units: IEC entry, 6' IEC power cord with NEMA 20 plug provided
  - 2200 watt unit: Hardwire junction box, no power cord provided
- 1/4" -20 Output stud (560 watt models)
- Output bus bar (1,000 & 2200 watt models) with 1/4" - 20 bolts
- Output "OK" L.E.D.
- Multi color LED: Green = Ok, Red = Fail (1000W models only)
- Loss-of-output alarm contacts- Form C, plus loss of AC alarm contacts Form C (1000 & 2200 watt units only)
- Front panel voltage test points

Options

- Three stage charger function with gel/lead-acid selector Model: CFB (560 & 1000 watts only)
- Temperature compensation (for battery charging). All models.
- DC Quick Connect Wiring Kit:
  560 watt models: QCK-3 (for 2-3 unit PM system) & QCK-6 (for 4-6 unit PM system)
  1000 watt models: QCK-3A (for 2-3 unit PM system) & QCK-6A (for 4-6 unit PM system)
  2200 watt model: CCK-4
- "Universal" mounting bracket; Model: UMB-PM (500 & 1KW models only)
- Metering, alarms, LVD and distribution breakers (PFM-400 or ULM-100 module options)

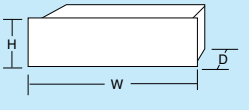
Protection

- Output fuse for reverse polarity
- Current limit
- Input circuit breaker
- Automatic high temp. output power reduction (560W & 2200W models)
- Forced air cooling with filter provided (560W models only)

Design Standards

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

Case Size – All Models



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

*19" mounting brackets provided

Power Function Manager

The Power Function Manager (PFM-400) is a system integrating component which converts ordinary power supplies (or Power Modules, shown on page 24) 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 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.

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 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
- 800 amp ground bus provided
- Up to five isolated distribution circuit breaker capacity with "TRIP" alarm contacts; easy front panel plug-in installation. Breakers sold separately
- Low voltage battery disconnect protects batteries in the event of extended AC power loss
- 19" or 23" rack mount, flush or 6" forward mounting

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

Specifications

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

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 ± 15%
- Max continuous current: 400 amps

Mechanical/General

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

Temperature Rating

-40° C to +60° C

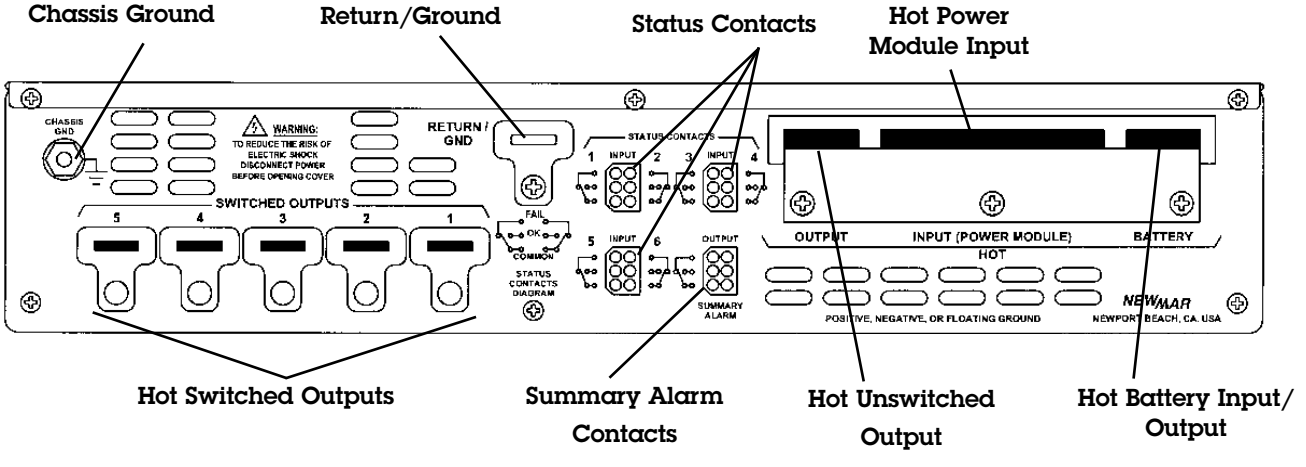
Circuit Breakers

- 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.) when ordering

Options

- Quick connect DC wiring harness for use with Newmar 1 KW Power Modules; QCK-3, CCK-4 (page **86**)
- Rear rack covers (page **86**)
- Power Modules (page **24**)
- Additional Distribution: Model DST-10 (UL) or DST-20A(UL) (page **58**)

Rear Panel View



Integrated Power Systems

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.

A precision regulated power supply/charger, back-up battery, low voltage battery disconnect, output metering, LED status and Form C alarm contacts are all pre-wired and calibrated within the unit for plug-and-play operation. Plug-in terminals are provided for easy wiring of an additional parallel rectifier input, or external batteries for increased back-up capacity.

The batteries are always in-line with the load, thus there is no interruption from relays or transfer switches in the event of AC loss. Batteries are recharged when AC is restored. A manual battery disconnect switch allows internal or external battery service or replacement while the system is running. Models available for -48, +24 and +12 volt applications.

Features

- Precision regulated power supply simultaneously maintains batteries at peak charge and supplies system load.
- Built-in batteries instantly power load during AC failure--no switch-over delay. 3-5 year average life. Terminals provided for additional external batteries for increased back-up capacity.
- Terminals provided for easy addition of parallel rectifier. (48V and 24V models only)
- Automatic low voltage and manual battery disconnect.
- Numerous front panel monitors--L.E.D. status indicators and digital ammeter/voltmeter.
- Form C summary failure alarm contacts; loss of internal rectifier output, loss of external rectifier output, LVBD contactor open. AC input failure alarm contacts optional.
- Numerous protection features--AC input breaker, internal battery breaker, auto thermal shutdown/recovery, current-limiting, short-circuit and over-voltage protection.
- 19" or 23", 6" forward rackmount brackets provided

Model	Input Amps @ Full Load 115 / 230	Output VDC	Output Adjustment Range	Output Amps Continuous	Output Supplemental Input Port*	Internal Battery Capacity	Ground Reference
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

NEWMAR Powering the Network

Integrated Power Systems

Specifications

AC Input

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

Frequency: 47-63 Hz

DC Output

Voltage/Amperage:
See Matrix on page 28

Maximum Load with External Rectifier and Battery Inputs: 40A

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

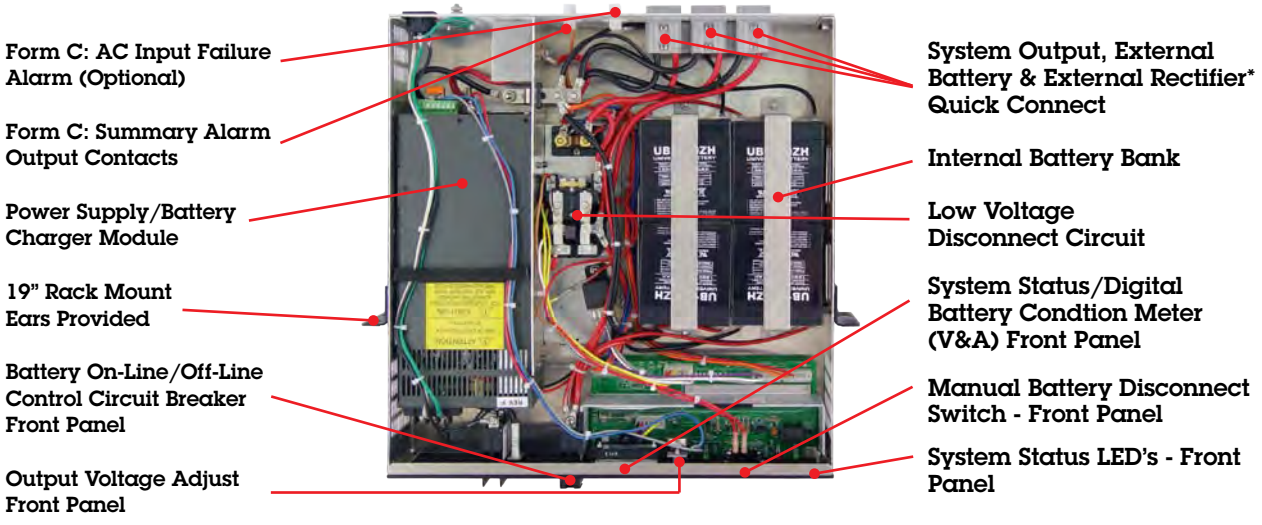
Rectifier/Battery Input Cable Assembly: Model CA-24

Rear Support Bracket for Flush Mounting: Model RSB-19

Distribution Panel: Models DST-10 (UL) & DST-20A (UL)

Unit Supplied Without Batteries

Top View with Cover Off



Internal Battery
Constat Current Performance (Amps) to 1.75 VPC

Model	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

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 noise free output and long service life.

Features

- Excellent Regulation and Ripple Spec: Output voltage maintained within 1% under all rated line and load conditions
- 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

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

Power Supplies - Heavy Duty Series

Specifications

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

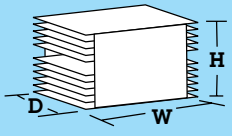
- Modify for use as a Battery Charger
- Output voltage adjust (see Output Voltage for range)
- Transfer relay for back-up battery in event of power failure (ERC option)

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)



	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

Back in 1974, Newmar began producing the Heavy Duty Power Supply Series, the first model designated 115-12-6A. The unit pictured, serial number 133, came off the tug boat "Hercules" in Galveston and was in service for 15 years powering a VHF radio. When returned to Newmar as part of our Reliability Certification Program, it worked perfectly and there were no records or indications that the unit had ever been repaired.

Power-Pac, USAR & ERC

Power-Pac - 12 Volt

This 12 volt, 10 amp power supply features built-in back-up batteries which are charged during normal operation and then continue to power radios when AC power is lost. Choose 7 or 14 amp-hour battery capacity.

- Highly regulated, low ripple output for noise-free radio operation
- Battery automatically comes on-line if AC fails
- Low battery alarm and disconnect
- Terminals for wiring external battery bank for greater reserve capacity

Specifications

Input: 115/230 VAC, 50-60 Hz.; **Output:** 13.6 VDC @ 10A int., 5A cont.

Operating On Battery

7 A/h battery installed
7 amps for 40 min.
10 amps for 20 min.
15 amps for 10 min.
20 amps for 4 min

14 A/H battery installed
7 amps for 100 min.
10 amps for 60 min.
15 amps for 30 min.
20 amps for 15 min

Model	Battery Capacity	Dimensions (H x W x D) Inches			Weight Lbs.
Power-Pac 7	7 Amp/Hour	5.3	9.0	10.5	18
Power-Pac 14	14 Amp/Hour	5.3	9.0	10.5	24

Unity Stand Alone Rectifier - 24 & 48 Volt

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.

A 6' power cord and a rear-mounted terminal block for easy wiring. Performance specifications are identical to single Unity Rectifiers detailed on **page 10**.

Model	Input	Output Voltage (Adjustable)	Amp Cont. Output	Dimensions H	W	D	Weight Lbs.
USAR48-3	115/230VAC, 50-60HZ	-54.4 VDC (42-56)	3	1.75	6.3	12.8	2.8
USAR24-6	115/230VAC, 50-60HZ	+27.2 VDC (21-28)	6	1.75	6.3	12.8	2.8

Emergency Relay/Charger - E.R.C. 12 & 24 Volt

Allows emergency battery tie-in to a radio system normally operated by a power supply. The radio connects through the ERC to the power supply and the E.R.C. maintains the back-up battery via a trickle charge.

When AC power fails 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.

Specifications

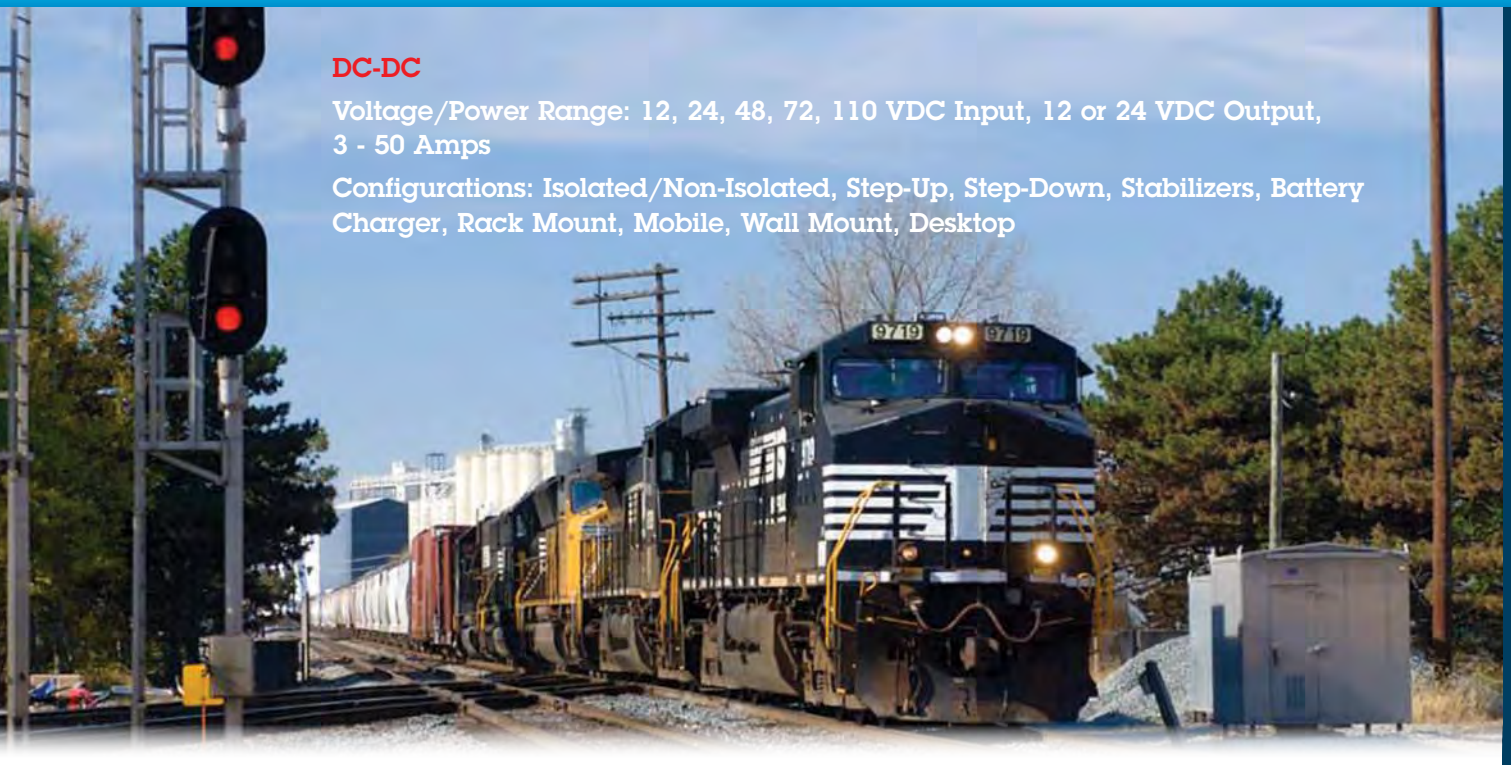
Relay Switch Over Time: 1 sec.

Trickle Charge: 1.5 amp

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

** Built to order*

DC-DC Converters



DC-DC

Voltage/Power Range: 12, 24, 48, 72, 110 VDC Input, 12 or 24 VDC Output, 3 - 50 Amps

Configurations: Isolated/Non-Isolated, Step-Up, Step-Down, Stabilizers, Battery Charger, Rack Mount, Mobile, Wall Mount, Desktop

Rack Mount

Rackmount DC Converter
Input: 24 or 48 VDC
Output: 12, 24, or 48 VDC,
15 - 30 Amps
Page 34

Mobile Mount

Standard Series
Input: 24 or 48 VDC,
Negative Ground
Output: 12 or 24 VDC,
3 - 50 Amps
Page 36

Isolated & Spike Protected Series
Input: 24, 36, 48, 72 or 110 VDC,
Positive or Negative Ground
Output: 12 or 24 VDC,
6 - 35 Amps
Page 38

Voltage Stabilizers, Mobile Mount

Stabilizer Series
Input: 12 or 24
Positive or Negative Ground

Input	Output
12	12
24	24

3 - 35 Amps
Page 78

Isolated Series
Input: 12, 24 or 48 VDC,
Positive or Negative Ground
Output: 12 or 24 VDC,
3 - 35 Amps
Page 39

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.

These units accept a wide input range at 24 or 48 VDC nominal, positive or negative ground, and produce pure 12, 24, or 48 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 and 48 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
- High temperature rating to + 50° C with forced air cooling
- Easily adapts to both 19" and 23" racks, flush or 6" forward mount
- Output volt and ammeter
- Output voltage adjustment on front panel
- Input/output circuit breakers
- Low profile – occupies two RU (one RU space above and below recommended for cooling)

Model	Input		Output			Weight (Lbs.)	Dimensions Inches		
	Voltage (VDC)	Max Amps	Voltage (VDC)	Adjustment Range	Amperage (Continuous)		H	W	D
48-12-30RM	40-60	12	13.6	12.6-14.5	30	10	3.5	19	14
48-24-15RM	40-60	12	27.2	25.2-29.0	15	10	3.5	19	14
24-48-8RM	20-30	24	54.4	12.6-14.5	8	10	3.5	19	14

Rackmount DC Converters

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-output-chassis

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

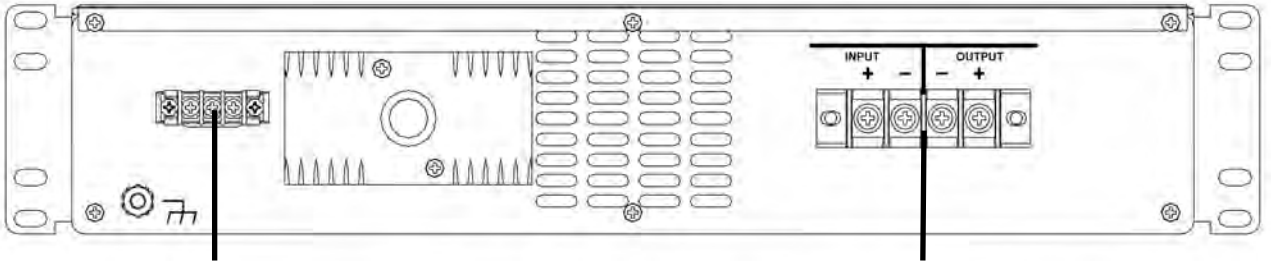
Protection

- 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

Rear Panel View



DC Output Failure Contacts Terminals

Input/Output Terminals

DC-DC Converters - Standard Series

Convert 20-50 VDC input to 12 or 24 VDC negative ground output for powering communication/ navigation equipment, on negative ground systems. (see Isolated series, page 39 for positive ground applications.) Ideal for powering voice and data transceivers in mobile applications.

Features

- 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.

Model	Input voltage	Output voltage	Output Amps		Case Size	Weight	
			Intermittent	Continuous		(Lbs)	(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

DC-DC Converters - Standard Series

Specifications

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 From100% @ 40° C To 50% @ 50° C. Thermal shutdown @ 70° C Case Temperature (all models except 24-12-3)

Model 24-12-3: Full output -25° to +30° C; Derate linerarly from 100% @ +30° C to 45% @ +50° C

Switching Frequency: 40 Khz

Efficiency: 85% - Typical.

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

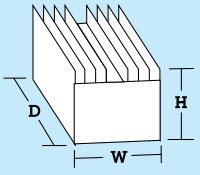
Mechanical

- Anodized aluminum heat sink case
- Front panel terminal block
- Heavy duty mounting flange
- Conformal coated PC board

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

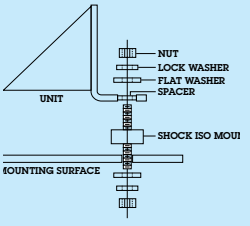
Case Size



Case	Inches H	W	D	Centimeters 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

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 vibration 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.

DC-DC Converters - ISP Series

Isolated and Spike protected series converters offer the benefits of an isolated converter 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 applications. A transient energy circuit clamps input spikes to a safe level, protecting both the converter and the powered equipment. Rugged case construction and internal components designed for severe vibration applications.

Features

- Wide range of input voltage
- Precise output voltage
- Reverse polarity protection
- Input fuse/Output fuse
- Current limiting, short circuit proof output
- Automatic re-setting thermal shutdown
- Input transient protection
- High/low input voltage shutdown

Specifications

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 x .7

Operating Temp: -40° C to +80°C Thermal shutdown @ 85° C

Efficiency: 85% - typical.

DC Isolation: 1,400 VDC Input/Output, Input/Chassis, Output/Chassis

ISP Surge Protection

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

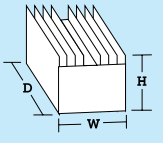
Options

- Operation as a battery charger or parallel/redundant operation (contact factory)
- High vibration mounting kit (see page 37)

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

† This model EMC and safety CE certified for sales within the European Union.
**Build to order only – 10 unit minimum*

Case Size/Dimensions



Inches/Centimeters

	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-9	6.0	6.8	16.5
	15.2	17.3	41.9

Powering the Network

DC-DC Converters - Isolated Series

This series provides voltage conversion as well as 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 and filter for sensitive equipment.

Features

- Wide range of input voltage
- Precise output voltage regulation
- Reverse polarity protection
- Input fuse/Output fuse
- Total input/output isolation, pos. or neg. ground
- Current limiting, short circuit proof output
- Automatic re-setting thermal shutdown
- High/low input voltage shutdown
- Polyurethane conformal coating on PC board
- Power "ON" light
- Rugged case designed for high vibration applications

Specifications

Output: 13.6 or 24.5 VDC (internally adjustable +/- 7%)

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

Operating Temp: 0-50° C; derate linearly from 100% @ 40° C to 50% @ 50° C

Efficiency: 85% - typical.

DC Isolation: Input/Output, Input/Chassis, Output/Chassis): 250 VDC

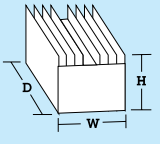
Options

Operation as battery charger, high vibration mounting kit

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	10-16**	24.5	6	4	C-8	6	2.7
12-12-35I	10-16**	13.6	35	20	C-9	12	5.5
12-24-18I	10-16**	24.5	18	10	C-9	12	5.5
48-12-6I	20-56	13.6	6	6	C-7	7	2.7
48-24-3I	20-56	24.5	3	3	C-7	7	2.7
48-12-12I	20-56	13.6	12	8	C-8	6	2.7
48-24-6I	20-56	24.5	6	4	C-8	6	2.7
48-12-18I	20-56	13.6	18	10	C-8	8	3.6
48-24-9I	20-56	24.5	9	5	C-8	8	3.6
48-12-35I	20-56	13.6	35	20	C-9	12	5.5
48-24-18I	20-56	24.5	18	10	C-9	12	5.5

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

Case Size/Dimensions



Inches/Centimeters

	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

NEWMAR

Powering the Network

Inverter-Chargers

Rack Mount Inverters

2U Series
Input: 24, 48 or 125 VDC
Output: 120 VAC, 800 - 1600 Watts
Page 42

1U Series
Input: 48 VDC
Output: 120 VAC, 1000 Watts
Page 44

Mobile Mount

IC Series Inverter-Chargers
Input: 12 or 24 VDC
Output: 120 VAC, 1800 - 4800 Watts
Page 46

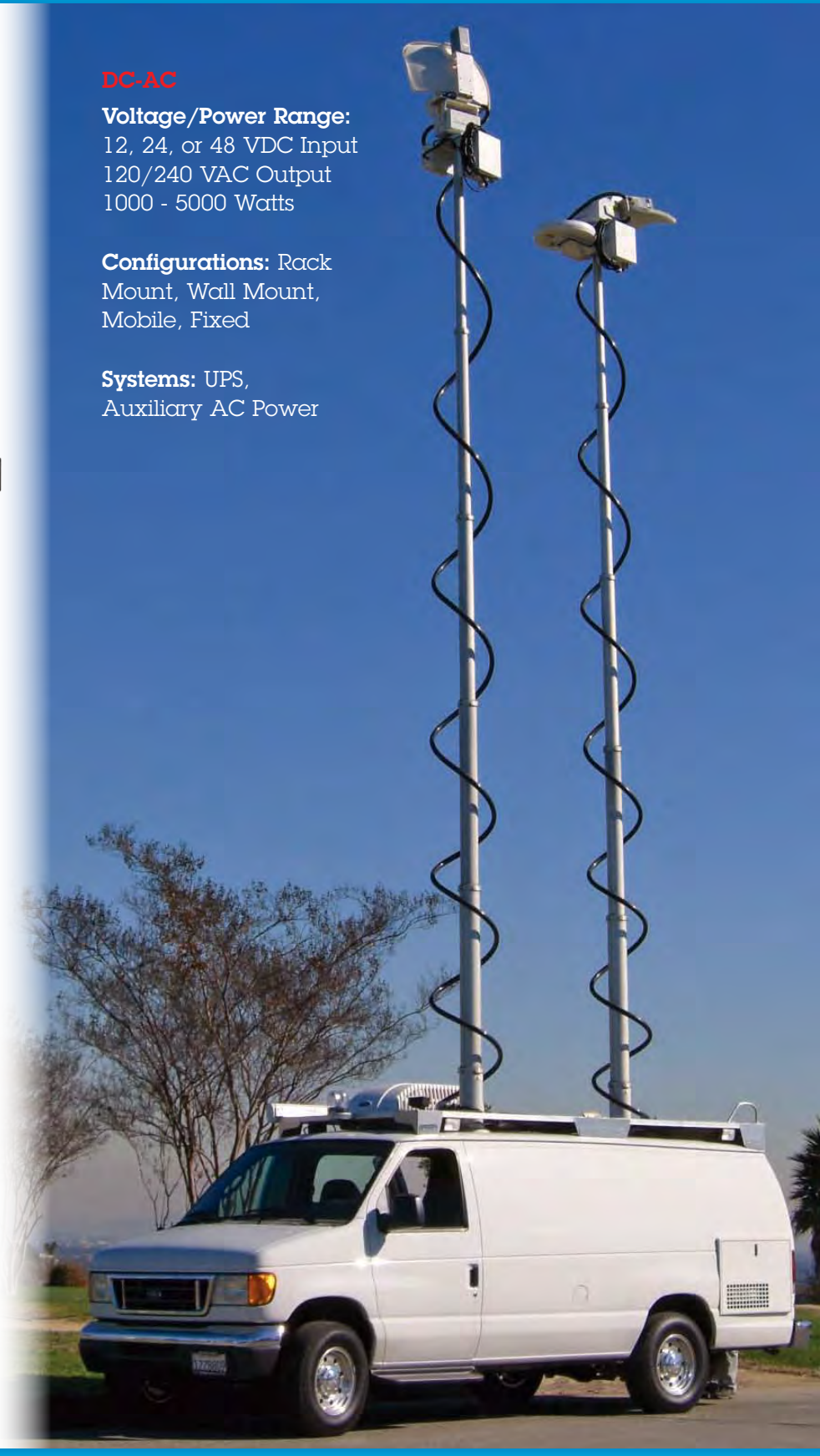
PS Series Inverters
Input: 12 VDC
Output: 120 VAC, 1000 - 2000 Watts
Page 41

DC-AC

Voltage/Power Range:
12, 24, or 48 VDC Input
120/240 VAC Output
1000 - 5000 Watts

Configurations: Rack Mount, Wall Mount, Mobile, Fixed

Systems: UPS, Auxiliary AC Power



Inverters - PS Series

The PS Series inverters produce high efficient, pure sine wave output from 12 volt battery input with high surge power for motor start making it ideal for mobile applications. A power saving mode, with user friendly adjustable set points, conserves batteries when not in use. A remote control/display panel and front panel indicator lights allows for easy analysis and control.

Features

- 1000, 1500, 2000W models
- Pure sine wave 115V output
- 12V input
- High effiency ~ 90%
- Power saving mode conserves battery when not in use, user adjust able set points
- AC duplex outlet on front panel
- Status indicators lights on front panel:
  - Input voltage
  - Output power level
  - Power Mode
  - Fault status
- Remote control/display included
- Protection:
  - Low input voltage
  - Overload
  - Short circuit
  - Overtemp
- Rugged compact case, ideal for mobile and industrial applications

Remote Panel Included

Description	Input	AC Out Continuous	AC Out Surge	Dimensions/Weight			
				H	W	D	Lbs.
12-1000 PS	12V	1000W @ 115V	2000W	3.46"	7.17"	15.08"	8.8
12-1500 PS	12V	1500W @ 115V	3000W	3.46"	7.52"	16.34"	10.5
12-2000 PS	12V	2000W @ 115V	4000W	6.53"	8.22"	14.5"	12.2

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" 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 for remote monitoring
- 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
- Adapts for 19" racks; occupies only 2 RU (3.5")
- UL and cUL listed

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

** I series models use IEC type AC output connector*

NEWMAR Powering the Network

Specifications

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

Outlets Rear Panel:
24-1000RM & 48-1000RM – (4 ea.) NEMA 5-15R
48-2000RM – (4 ea.) NEMA 5-20R

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

Transfer Time: <4 ms.

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

Mechanical

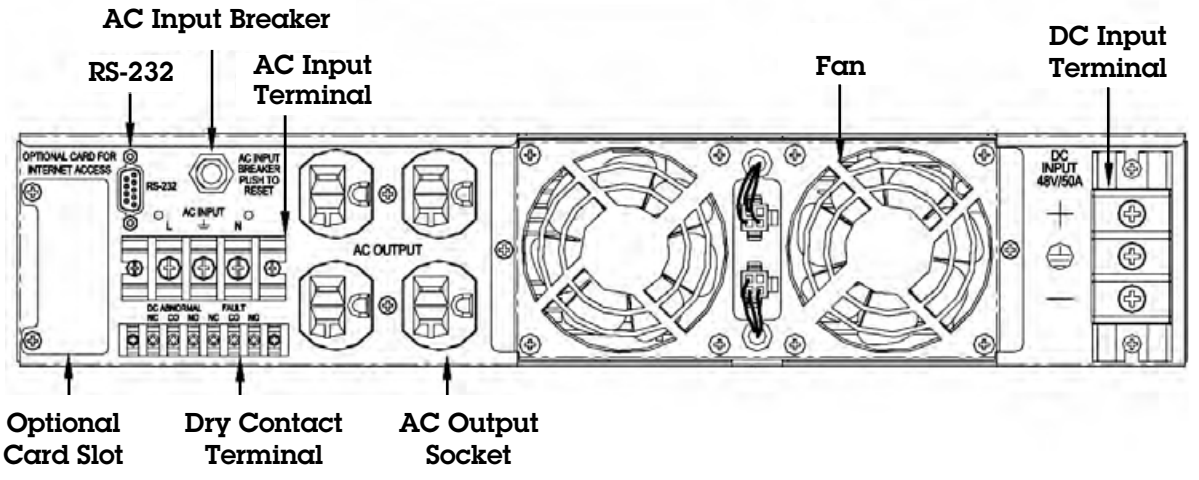
Dimensions: 17.4"W x 3.5"H x 11.6"D

Mounting: 19" Rack

Weight: 24-1000RM & 48-1000RM – 15.4 Lbs.,
48-2000RM – 17.6 Lbs.

Options

Remote monitor via RS 232 port. SNMP card required.



Rackmount Inverter - 48-1U-1000RM

This inverter provides seamless back-up power for AC powered communications equipment from the site's 48 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 low profile case for 19" 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 Watts – easily cascaded for N+1 redundancy, providing maximum reliability required by data centers
- Low EMI and RFI interference characteristics
- High efficiency: 88% (Full linear load at 120 VAC Output)
- Two NEMA 5-20R AC receptacles provided
- Utility bypass, with fast load transfer switch, <8mS
- Numerous circuit and load protections: over- temp, overload, reverse polarity, high/low battery voltage, AC input breaker
- Load & temperature controlled cooling fan
- Form C alarm contacts for monitoring Abnormal conditions
- Fan aging, failure, disconnect and blockage alarm
- All diagnostic Operation Controlled by a microprocessor
- User-friendly Status and Diagnostic LCD/LED displays
- Remote Power Management optional via remote control relay RS-232 port
- Standard 19" 1U Rackmount
- UL and cUL listed

See page 42 for 2000W units.

Model	DC Input		AC Output	Weight (Lbs.)
	Voltage	Amps	Watts	
48-1U-1000RM	36 - 60	25	1000	12.7

NEWMAR Powering the Network

Rackmount Inverter - 48-1U-1000RM

AC Characteristics

Voltage: 97-123 VAC (select using front panel selection buttons or RS-232 port and additional software); Factory set at 110 VAC

Frequency: 60 Hz. Standard, 47-63 Hz. User selectable

Wave Form: Pure Sine

Total Harmonic Distortion: THD < 2%

Transfer Time:

From AC bypass mode: ≤ 20mS

From Inverter mode: ≤ 8mS

Input:

No Load Current: .75A

Over Voltage Protection: 60 VDC

Under Voltage Protection: 36-44 VDC

Voltage Range:36-60 VDC

Efficiency: 88 %(Full Load)

Output:

Voltage: 97-123 VAC

Transfer Switch: 15AMP/120VAC

Max Output power (3min): 1100W

Surge power: 2000W

Displays

LED: Inverter (On), AC Grid, Bypass and Alarm

LCD: 2 line LCD w/ Keypad for navigation,
Selectable functions: Input OVP, UVP voltage, UV alarm & Alert settings, Output voltage, Frequency settings, Online, Offline(Haphazard, normal, Exacting) settings

Operating Temperature: 0° to 50° C Full Load, -30°-70° C in Storage

Cooling: Forced air, front-to-back On @ Internal > 55°C or load > 30%

Humidity: 0-90% relative humidity

Visual & Audio Alarms:

- Form C (Dry Contact) terminals
- Overload / Short Circuit Alarm
- Input UV / OV
- Over Temperature
- Fan Failure (Buzzer alarm)

Communication Interface

RS-232 port, Remote control of inverter (on/off)

Mechanical

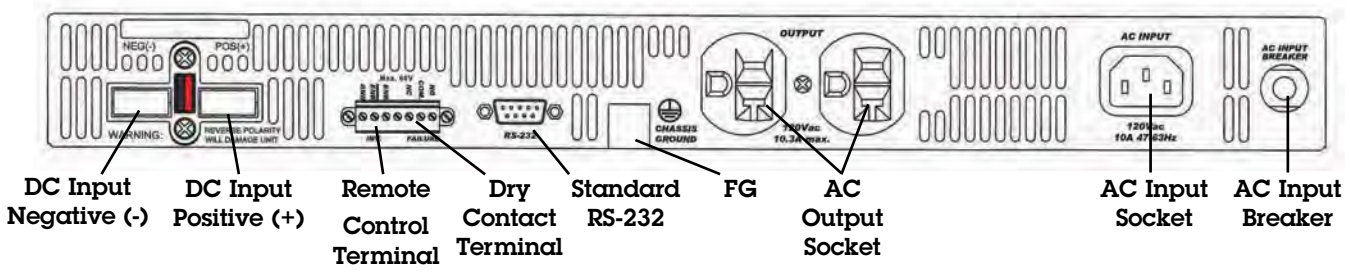
Dimensions: 16.5"W x 1.713"H x 15.5"D

Mounting: 19" or 23" Rack (Requires 19"-23" adaptors)

EMC & Safety Standards

FCC CFR Title 47 Part 15 subpart B:2005 class B,
CISPR 22:2005 CE Marked
En55022:1998+A1:2000+A2:2003 Class B,
En55024:1997+A1:2001+A2:2003 Class B
En61000-3-2: 2006 Class A, EN 61000-3-3:1995+A1:2001
FCC Class B, UL60950-1, CAN/CSA-C22.2 No.60950-1 & TUV EN60950-1

Rear Panel View



Powering the Network

Inverter-Chargers

These inverter-chargers deliver pure, sinusoidal AC for flawless operation of all appliances and sensitive electronics and contain charger to replenish battery when AC is present.

Features

- Generates "Perfect Wave" 120 VAC for powering highly input-sensitive computers, electronic controllers/ processors
- Built-in high output three stage, temperature compensated charger for rapid battery bank replenishment - programmable for gel-cell, lead-acid or AGM battery type with amp-hour capacity selector
- Models available for 12 and 24 volt systems
- Internal charger is activated by an autommatic transfer relay when external AC power is available. Optional Battery Integrator permits charging of multiple banks
- Large DC input terminal blocks and front panel GFCI protected outlet receptacles. AC output from the inverter may also be hard-wired
- Operation clearly displayed with front panel status indicators-optional remote panel available
- Numerous safety and circuit protections: short circuit, over load, over-temperature, ground fault protection, output circuit breaker
- Thermally controlled cooling fan prolongs life of components
- Automatic low voltage shutdown circuit prevents damage to batteries due to over-discharge when using inverter function
- Heavy duty powder coated aluminum construction and polyurethane coated internal circuitry—built to last in the harsh industrial environment
- UL listed with full two year warranty

Optional

Remote Control and Indicator Panel

Model: ICR-2
Specify 25 or 50 feet of wire length

Case	Inches			Centimeters		
	H	W	D	H	W	D
I-2	7.5	16	15.5	19.1	40.6	39.4
I-3	10	17	16	25.4	43.2	40.6

Model Inverter Output:	12-1800IC	12-3000IC
Watts (Surge)	4000	6500
Watts (Cont.)	1,800	3,000
Wave Type	PS	PS
Inverter Input:		
VDC	11 - 14	11 - 14
Max. Amps	180	300
Charger Input:		
Max. Amps	15	20
Charger Output		
Max Amps @ V	85A@12V	105A@12V
Case		
Case Size Ref.	I-2	I-3
Weight (Lbs./Kgs)	54/25	75/35

Model Inverter Output:	24-2200IC	24-4800IC
Watts (Surge)	6,500	14,000
Watts (Cont.)	2,200	4,800
Wave Type	PS	PS
Inverter Input:		
VDC	22 - 28	22 - 28
Max. Amps	110	240
Charger Input:		
Max. Amps	15	40
Charger Output		
Max Amps @ V	40A@24V	105A@24V
Case		
Case Size Ref.	I-2	I-3
Weight (Lbs./Kgs)	54/25	75/35

NEWMAR

Powering the Network

Batteries

BM Series
Page 48

Battery Strings
Page 49

Battery Shelf & Module System

48 Volt

BM Series Battery Module

Installing system back-up batteries or increasing current capacity has never been easier. The BM Series Battery Module, provides the complete solution in one low profile 2RU (3.75") chasis. No need for sourcing and installing battery trays, interconnect cable, terminals, lugs, battery breaker, etc. The BM provides it all in one package – sealed, maintenance – free batteries included – with easy input output plug-in connectors on the chassis rear. Multiple modules may be paralleled for increased capacity.

The system comprises of a rack mount Battery Shelf and one or two 48 VDC Battery Modules. The shelf and modules are sold separately.

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 provided for 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")
- Internal batteries are sealed, maintenance-free and are IATA and DOT certified for shipment by air
- Plug-in polarized connector assemblies enable quick, easy, plug-and-play installation and elimi-nate the danger of reverse polarity connections
- Multiple shelves and modules may be paralleled for increased reserve capacity
- 19" rack mounting brackets are provided for 6" forward mount configuration (3" relay rack rail required.)
- Battery on-line/off-line circuit breaker/switch controls output and provides overload protection

Over-Current Protection: Circuit Breaker/ Switch

Output Connector Rating: 50 amps maximum

Temperature Rating: -15° to +50° C

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, maintence-free AGM. IATA and D.O.T. certified for shipment by air.*
- *Typical Battery Life: 3-5 years in standby use*

Model	**Dimensions (In.)**			**Weight Lbs.)**
	H	**W**	**D**	
Battery Module	3.4	7.4	18.8	20
Battery Shelf	3.5	19	18.2	5

Model	**Voltage**		**Reserve Capacity**	**Circuit Breaker Protection**
	Nominal VDC	**Float VDC**		
BM 48-4, Battery Module	48	54.4	4 Amp-Hour	15 Amp

Model	**Description**
BMS-19/23 Rackmount Shelf	Accommodates 1 or 2 Battery Modules

Batteries

NEWMAR

Powering the Network

Battery Strings

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 charging and monitoring 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 84** for a selection of rackmount battery trays and **page 83** for battery disconnect panels.

Battery Chargers

PTM Series
Input: 115/230 VAC
Output: 24 VDC, 67 Amps
Page 51

PT Series
Input: 115 or 115/230 VAC
Output: 12, 24, or 32 VDC,
7 - 95 Amps
Page 52

ABC Series
Input: 115/230 VAC
Output: 12 VDC,
8 - 25 Amps
Page 54

Ni-Cad Series
Page 55

110 VDC Wall Mount Series
Input: 90 - 300 VAC
Output: 110 VDC
25 Amps
Page 56

Battery Chargers - PTM Series

The PTM series applies the "fault-tolerant" concept to 24V battery charging systems, by using multiple independent charger modules within the unit.

It consists of a wall mount case which serves as connection point to AC input and battery bank output, as well as three front-facing 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 modules are easily identified and can be quickly replaced with an on-hand spare or an exchange unit from the factory.

The system features three stage charging for rapid recharge and optional temperature compensation for optimal battery life. See our Phase Three Page for a complete description of the three stage charging process.

24 Volt

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

Nominal Charge/Float Voltages: Refer to chart on Phase Three Page

Temperature Compensation (Option): - 5 mV per cell per °C (typical)

Temperature Rating: 0-60° C; derate linearly from 100% output @ 50° C to 80% output @ 60° C
Recommended Battery Type/Capacity:
Gel-Cell, Flooded or Sealed Lead-Acid;

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

Case Material: Powder Coated Stainless Steel

Weight: Empty: 16 lbs/7.3 kg. - With three modules installed: 34 lbs/15.5 kg.

**Note: Charge modules are shipped in the same carton as the PTM case and are then placed in position by the installer.*

Individual Module Specifications

Models: PTM-24-22 (24 volt)

Protection Features: Input Fuse, Output Fuse, Current Limiting, Over Voltage Protection, Cooling Fan, Automatic Thermal Shutdown/Recovery

Compliances: CE Mark, UL Recognized; E183223, Level 3 Safety: EN60950-1 USA, Canada, Europe
EMI Radiated and Conducted: FCC Part 15 Level A; EN55022 Class A

Status Indicators: Output OK (Green)/FAULT (Red)

Weight: 6 lbs.

PTM-24-22: 22.5 amps max in Bulk Phase; 20 amps max in Absorption/Float Phase

Options

Temperature Compensation Sensor: Model TCS-12/24

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-24-67	3	67 @ 24 V	9 /18	20.9	10.9	8.8	53.1	27.7	22.4	34	15.5

NEWMAR

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 continous 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.

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

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

Optional Remote Panel, Model RP:

LED's indicate charger output stage. Button allows manual reinitialization of three stage charge cycle. Panel dimensions: 3" H x 4.75" W. Except models PT 40U and PT-24-20U

NEWMAR 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.)	88-132 176-264	85-264	90-132 180-264	90-264	90-264	85-264	90-132 180-264	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
(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.	T-1	T-2	T-4	T-5	T-7	T-2	T-3	T-5	T-8	T-6	T-8	T-6
Rating Reference												
Case Size Ref.	A-1	A-2	A-2	A-3	A-5	A-2	A-2	A-3	A-5	A-6	A-6	A-4
Weight; Lbs./Kg.	3.2/1.5	8/4	8.2/4	11/5	15.2/7	8/4	8.2/4	11/5	12.2/6	24.1/11	24.5/11	12.2/6
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	N/A	RP	RP	RP	N/A	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

Temperature Rating References

	Temperture	Derate linearly from 100%
T-1	-10°C to +45°C	100% @ 0°C to 80% @ -10°C
T-2	-10°C to +60°C	100% @ 40°C to 60% @ 60°C
T-3	-10°C to +60°C	100% @ 50°C to 60% @ 60°C
T-4	-10°C to +60°C	100% @ 40°C to 60% @ 60°C
T-5	-20°C to +60°	100% @ 50° to 60% @ 60°C
T-6	-20°C to +50°C	Full output
T-7	-20°C to +70°C	100% @ 45°C to 50% @ 70°C
T-8	-20°C to +70°C	100% @ 50°C to 50% @ 70°C

Case Size

	Inches			Centimeters		
Ref	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	13.8A	9.8	5A	35A	24.9	12.7A
A-5	14.8B	9.6	5.6B	37.6B	24.4	14.2B
A-6	17.5C	12	7.2C	44.5C	30.5	18.3C

With Dripshield Installed:
** Add .75" (1.9 cm) to height & 1.35" (3.4 cm) to depth*
A Add 1.27" (3.2 cm) to height & 1.1" (2.8 cm) to depth
B Add 1" (2.54 cm) to height & .5" (1.27 cm) to depth
C Add 2" (5.08 cm) to height & 1" (2.54 cm) to depth

Compliance References*

See matrix for applicable models

UL: UL 1950 (Per DNB report)
CG: USCG CFR 183.410 (Ignition protected)
EN: EN 60335-1, EN 60335-2-29
CE: Carries the CE Mark

** Numerous other Safety and EMC compliances may also apply. Contact factory if further compliance information is required.*

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

NEWMAR

Powering the Network

Battery Chargers - ABC Series

These Chargers utilize time tested SCR charging circuitry, individually sensing and regulating each of 2 isolated battery banks, allowing the user to leave the charger operating indefinitely, even under no-load conditions without fear of overcharging. They are ideal for vehicle applications which have an intermittent demand for battery power.

For battery systems which require high continuous output, see our Phase Three Chargers **page 47**.

These chargers are housed in a rugged, black anodized aluminum, heat-sink case which extracts heat without introducing dust & moisture to the inside of the unit. The reliable ABC charger is employed in hostile environments throughout the world; in mining equipment, emergency service vehicles and rugged off-road applications.

All ABC chargers feature a total output ammeter, on-off power switch, power "on" indicator light, 115/230 VAC input voltage selector switch, factory installed AC power cord with molded plug and shock-resistant rubber mounting grommets. Circuit boards are polyurethane conformal coated for corrosion resistance and all are protected against overheating by an automatically resetting thermal switch.

Features

- Total output ammeter
- Dual independently regulated output banks
- On-off switch and power "on" indicator light
- Vibration absorbing mounting grommets
- Anodized aluminum case
- 115/230 VAC input selector switch
- Auto-reset thermal breaker
- Conformal coating of circuit board

Model	Input		Output			Inches			Centimeters			Weight	
	Volts (all models)	Amps*	Volts	Banks	Amps	H	W	D	H	W	D	Lbs.	Kg.
ABC 12-8	105-125 VAC or 210-250 VAC	2/1	12	2	8	8	6.0	4.2	20.3	15.2	10.6	9	4.1
ABC 12-25	50-60 Hz.	5/3	12	2	25	11.9	4.7	6.2	30.2	11.9	15.8	14	6.4

** @ Full Load*

Powering the Network

Battery Chargers - Ni-Cad Series

Nickel Cadmium batteries require specialized charging regimens to safely restore their cells to full energy capacity. Critical factors include: proper programming for the number of cells, battery capacity rating, voltage setting, current control, and temperature compensation. This series of chargers provide all these necessary features.

Charging Features

Programmable output - for selecting proper charge regimen of Ni-cad batteries by selecting:

- Number of cells (5/10)
- Constant Current level
- Constant voltage
- Float voltage
- Battery capacity

Digital readout provides system status and simplifies programming:

- Battery voltage
- Output current
- Amp-Hours supplied
- Time until end of charge cycle

Temperature compensated output adjusts voltage based on battery temperature, ensuring safe charging and long battery life

Power

800 Watt output power returns energy to battery quickly; 50 amps to a 10 cell string

Monitors & Alarms

Large front panel indicator lights provide easy visual check of charger status:

- On Charge
- End of charge cycle

Visual and audible two tone alarms alerts to problems:

- High battery temperature
- Over current
- High ambient temperature
- Extreme battery discharge
- Battery disconnected

Design Details

- Micro-processor based circuit provides precise output per installers programmed characteristics
- Rugged industrial circuit and case designed for wall mount applications
- Fan cooled
- High current plug-in output connector
- Easy programming via front panel display and selector switch
- Models for 115 and 230 VAC input
- Size: 11.6" H x 6.3" W x 3.3" D

Preliminary Product announcement, contact factory or view web site for specific model details and availability.

Battery Charger - 110 VDC Wall Mount

This high voltage battery charger with a power output of 3.0kW and maximum current of 27A is an ideal battery charging solution for 110 VDC utility protection and control equipment where 19" rack space is unavailable.

Utilizing intelligent controller and modular rectifiers, this stand alone wall mount high voltage battery charger is designed for easy installing directly to a vertical surface or used as a mobile charger. Voltage easily customized and configured to meet specific requirements.

Fan cooled and supplied with a durable easy clean air filter that requires minimal maintenance.

Features

- Fully featured industrial grade internal rectifier
- Large visible alpha-numeric status display
- Network monitoring available
- Configurable DC earth leakage detection option
- Wall Mount configuration leaves room for additional equipment in a 19" rack/cabinet
- High amp power connectors for ease of connection
- Hot swapable, internal rectifiers allows replacement under load
- Easily customized and configured - contact Newmar with your specifications

Model: DC110-25 WM

Specifications

AC Input: 90-300 VAC, single phase with surge protection and 32 amp input breaker

Frequency Range: 45-66Hz

Power Factor: >0.99 (full load)

System

Output Power: 110V (80-155V DC)
3000W @ 120V DC, 25A nominal, 27A max

Monitoring and Control: Full temperature compensation, automated and manual battery testing/equalization and three voltage-free relay alarm outputs.

DC Distribution Breakers

Load: 1x 32A 2 pole

Battery: 1x 32A 2 pole

Mechanical

Weight: 24 Lbs.

Dimensions 24.4" H x 14.8" W x 3.15" D

Preliminary product announcement, contact factory or view web site for more information.

Powering the Network

DC Power Distribution

Circuit Breaker
Distribution Panel
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Circuit Breaker & Fuse
Distribution Panel Page
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Fuse Panel
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Circuit Breaker Distribution Panel

c UL US LISTED

The DST Series are a high density Rackmount Distribution Panels 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.

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 provide 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 overcurrent 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 Panel is shipped without circuit breakers installed, they are easily added at site.

Specify the required amperages when ordering and plug into panel during installation. Available amperages: 5, 10, 15, 20, 25, 30, 40, 50, 75 and 100. 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.

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.

Rear protective cover provided: attaches to back of panel within the 2 RU vertical rack space.

Mounting brackets are provided to adapt the panel for 19" racks.

DC Power Distribution

Model	Voltage	Bus	Total Circuit Capacity	Total Current Capacity	Dimensions (Inches)				Weight* (Lbs.)
					H	W	D (Panel)	D (w/ Cover)	
DST-10	12/24/48 VDC	Single	10	450 Amps	3.5	19	11	14.4	9
DST-20A	12/24/48 VDC	Dual	20	900 Amps	3.5	19	11	14.4	12

** Weight with no circuit breakers installed*

NEWMAR Powering the Network

Circuit Breaker Distribution Panel

Specifications

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 - PBA Series

UL Recognized

CE Marked

Current Ratings: 5, 10, 15, 20, 25, 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

Mechanical

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

Front Panel: Anodized aluminum

Top Cover, Rear Panel: Vinyl-laminated aluminum

Alarm/Indicator

Tripped Breaker Contacts via Rear Panel

Connector; Normally Open configuration

Note: Separate contacts for each bus on model

DST-20A

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

Options

Rear Terminal Cover Assemblies

Model: RRC (Optional)
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)

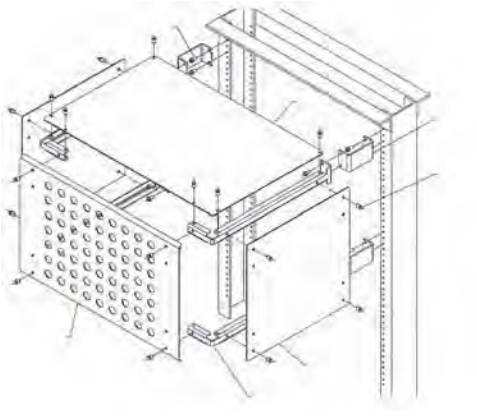
Return Bus Bar Assembly - Rear Rack Mount
800 amps; Model BBA-800

Rear Terminal Cover Provided

Return Bus Bar - order separately

Model: BBA-800

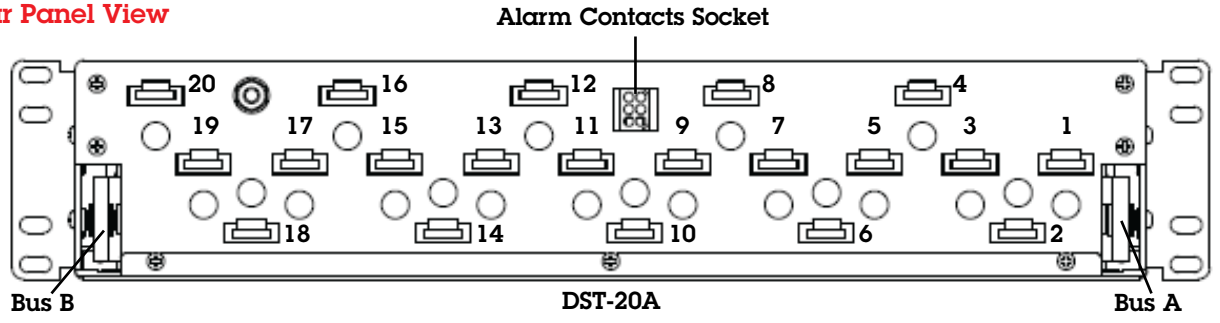
See page 85



Optional Rear Rack Cover - 3 or 7 RU

See page 86

Rear Panel View



Circuit Breaker & Fuse Distribution Panel

Combination DC Power Distribution Panel Utilizes Both GMT Fuses and Circuit Breakers.

The DST-FB panel offers a unique combination of circuit protection, utilizing both circuit breakers and GMT fuses in a single, 2 RU rack mount assembly. This provides system integrators a flexible DC power distribution system allowing the installer to assign low power loads to fuses and high power loads, up to 30 amps, to circuit breaker protected circuits. The unit features dual busses, one bus accommodating 8 plug-in circuit breakers and the second holding up to 8 GMT style fuses. Front panel LEDs indicate power available per bus as well as blown fuse and tripped/off circuit breaker occurrence. Tripped condition also activates form C contacts for integrating remote alarm reporting. The panel integrates with 12, 24 or 48 volt systems, any ground reference, making the unit ideal for any power system.

Features

- 12, 24, or -48 VDC, Positive or Negative Ground
- Integrates easily with any power system
- Dual Bus (100 amps ea.): Bus A, 8 x GMT fuses; Bus B, 8 x plug-in circuit breaker capacity (fuses and breakers sold separately)
- Easily convert dual bus into single bus with provided jumper (200 amps max., 100A Bus A + 100A Bus B)
- Indicators: Power available LED, blown fuse LED, tripped/off circuit breaker LED
- Form C alarm contacts

8 Plug-in Circuit Breaker Capacity
DST-FB Series
Available Ratings
5, 10, 15, 20, 25, 30A

8 GMT Fuse Capacity
Available Ratings
1, 3.5, 7.5, 10, 15A

DC Power Distribution

Model	Nominal Input/Output	Total Circuit Capacity		Total Current Capacity	Dimensions (Inches)			Weight* (Lbs.)
		Circuit Breakers	Fuses		H	W	D	
DST-FB	12, 24 or 48 VDC	8	8	900 Amps (dual bus)	3.5	19	11	5.5

** Weight with no circuit breakers installed*

NEWMAR *Powering the Network*

Circuit Breaker & Fuse Distribution Panel

Specifications

Electrical

Nominal Input: 12, 24 or 48 VDC, Positive or Negative ground

Total Circuit Capacity (16 total): 8 GMT fuses & 8 breakers

Dual Bus:
Bus rating: 100 Amps each max.
Bus A: Feeds 8 x GMT fuses, 15 Amps max., fuse rating
Bus B: Feeds 8 x plug-in circuit breakers, 30 Amps max., breaker rating

Circuit Breaker Values:
5, 10, 15, 20, 25 & 30 amp., easy plug-in via panel front (sold separately) DST-FB series

GMT Fuse Values:
1, 3, 5, 7.5, 10 & 15 amp, (sold separately)

Indicators & Alarms

- Power Available LED, one per Bus (Green)
- Blown fuse LED (Red)
- Tripped/Off circuit breaker LED (Red)

Alarm Contacts: Form C, one each for Bus A & Bus B, activates on any of the above alarm conditions

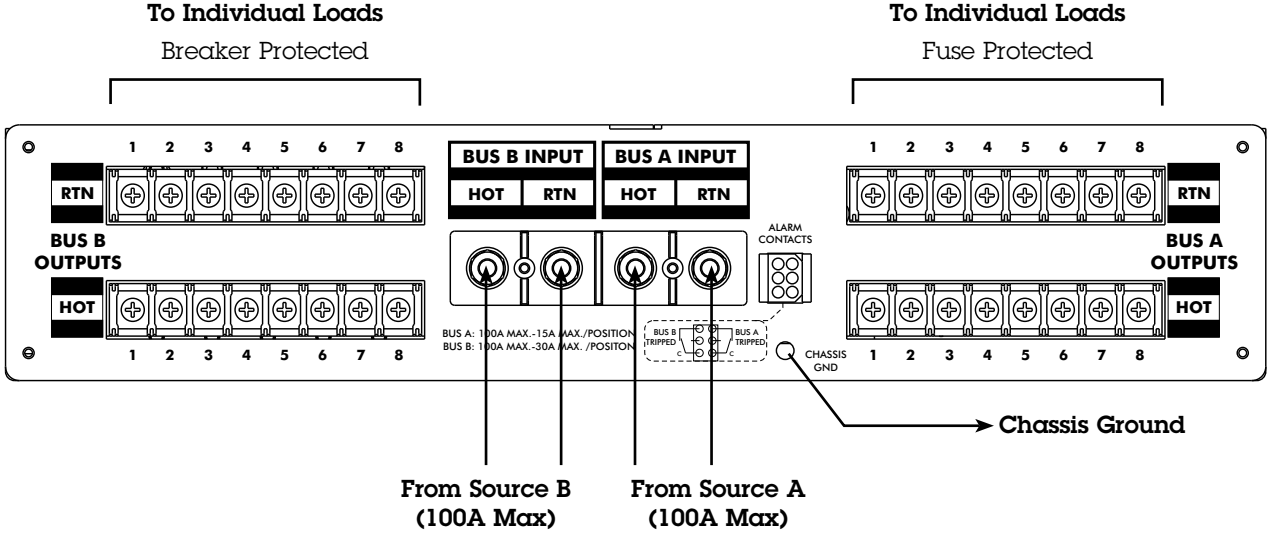
Mechanical

Chassis: Vinyl laminated aluminum with powder coated front panel
Rack Size: 19", 2 RU, flush or center mount

Environmental

Operating Temperature: -40 to +60°C

Rear Panel View



Isolated Inputs A and B Can Be Combined Using Supplied Shorting Bars

200A Max Combined, 100A Max/Bus

Fuse Distribution Panel

FDP-1010

These fuse panels are ideal for DC distribution for low power loads in 24 and 48 volt positive and negative ground network applications and provide enhanced system reliability via a dual input bus which allow configuration with redundant power sources. Each input bus accommodates 10 or 20 GMT 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 indicate 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 inch rack mounting.

Features

- GMT Fuse holders, 15 amps max.
- Form "C" alarm contacts
- Polarity insensitive panels work with positive and negitive ground systems -/+ 24 or -/+ 48 VDC
- Power On and alarm indicator lights
- 1RU (1.75") in height will configure to 19" or 23" rack mounting

GMT Fuse
Available Ratings
1, 3, 5, 7.5, 10 and 15 Amps

DC Power Distribution

Model	Nominal Input/output	Total Fuse Capacity	Amps per Bus (Dual Bus)	Total Current Capacity	Dimensions (Inches) H	W	D	Weight (Lbs.)
FDP-1010	+/-24 or 48 VDC	20	100	200A	1.75	17	11.5	8
FDP-2020	+/-24 or 48 VDC	40	100	200A	1.75	17	11.5	8

Fuse Distribution Panel

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, 7.5, 10, and 15. Other ratings available upon request
Note: Fuses sold separately

Front Panel Details

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

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" rackmount, flush mount or 6" offset
- 1 RU (1.75"), can be zero clearance mounted directly adjacent to other equipment

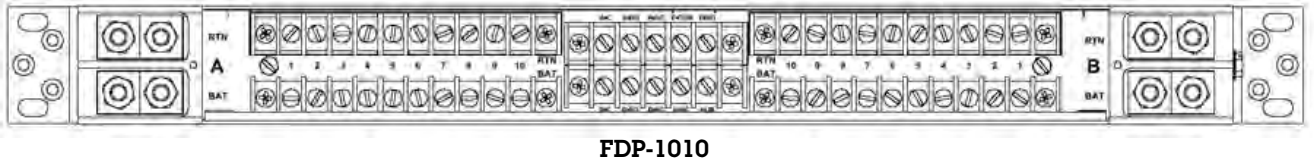
Alarms

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

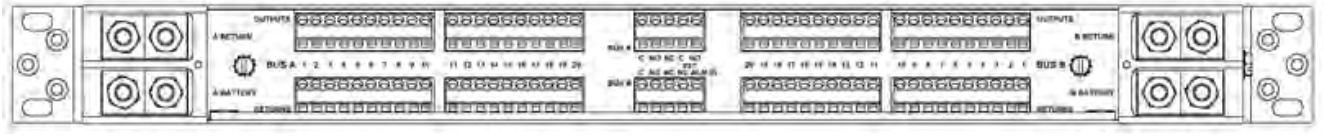
Rear Panel Details (see illustration below)

- 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

Rear Panel Views



FDP-1010



FDP-2020

Digital Instruments

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 available 2 1/2" square.

Model	
ACE	Displays volts, amps, frequency and wattage of 115/230 VAC systems. High/low volt/frequency alarms. Current transformer included. 2 1/2" square face
ACE-VAF-100	ACE meter, same as above with 4-1/4" x 4-1/4" square face
DCE	Displays DC volts, amps, energy used/remaining in battery system; 500 amp shunt included. High/low voltage, low amp-hour alarms. 2 1/2"
DCE-VAH-110	DCE Meter, same as above with 4-1/4" x 4-1/4" square face
DCV	Displays DC volts for three battery banks. High/low voltage alarms. 2 1/2" square face

Electrical System Meter: AC & DC

An essential tool for any electrical system installer or site maintenance technician, the Electrical System Meter provides extremely accurate data on all major AC and DC electrical functions in a convenient hand-held device with large easy-to- read LCD display.

Measures and Displays

- Voltage up to 400 VAC
- AC Current up to 200 Amps
- Frequency at 50-100,000 Hz
- DC Voltage up to 400 VDC
- DC Current up to 200 Amps
- Electrical Continuity

Features

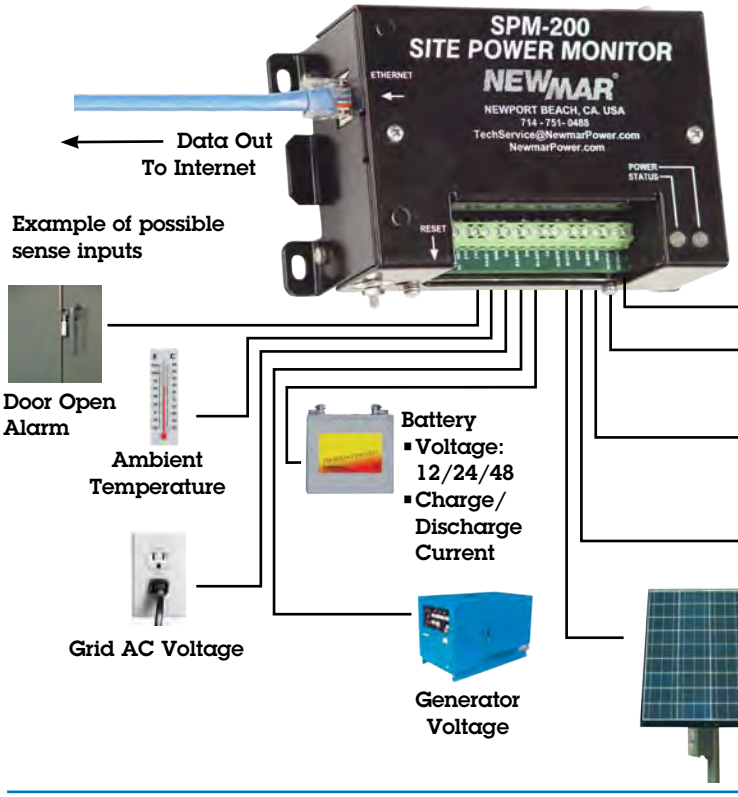
- Clamping sensor allows current measurement without disconnecting wiring or shunt installation
- Long easy-grip color coded needle-type test probes
- Operates on two AA batteries (provided)
- Protective carry-case included

Model: ESM

Power Monitoring & Control

NEWMAR Powering the Network

Power Monitoring & Control



Site Power Monitor - SPM-200

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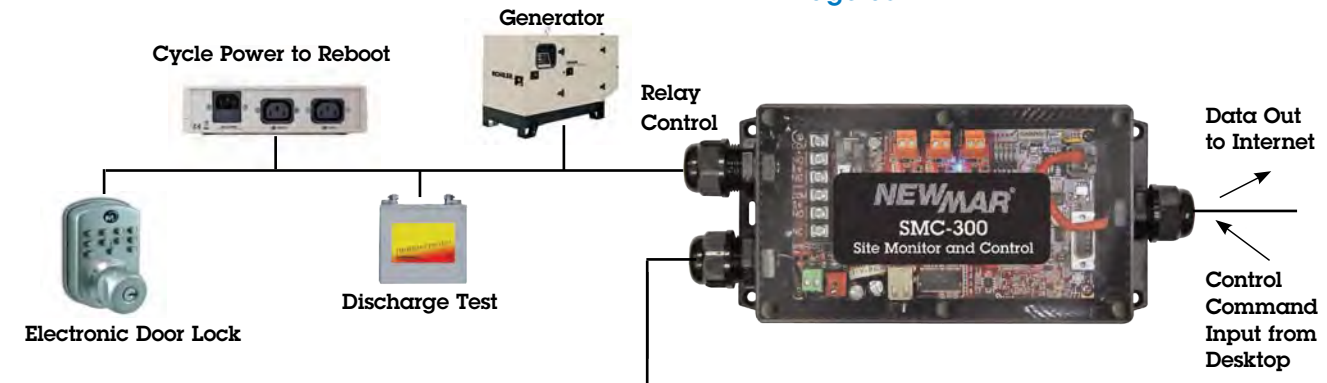
Site Power System
- Alarms - Major/Minor
- Voltages
- Current
- Temperature
- Low Voltage Disconnect

Rectifier/Battery Charger
- DC Bus Voltage
- Output Current

DC Distribution Panels
- Bus Voltage
- Load Current
- Breaker Trip Alarm

Inverter
- DC Input Voltage
- AC Output Voltage
- Alarms

Remote Activation Examples



Site Monitor & Control - SMC-300

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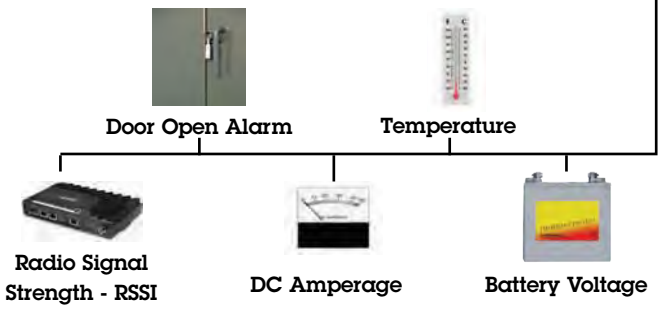
Remote Sense Examples



Site Power Monitor

Web-enable and integrate intelligence to any site's AC and DC power system for 24/7 monitoring, alarm condition notification, and data logging of vital electrical 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 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, and outdoor enclosures 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.

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

Optional Accessories

- Video Cameras
- 12 or 24 volt wall plug power supply
- Multi-site software
- Rackmount Panel
- Sensors
  - Water
  - Door/Window open alarm
  - Fire/Smoke detector
  - Shunts

Model	Input	Dimensions (Inches)			Weight
		H	w	D	
SPM-200	9 - 60 VDC, neg./pos ground, 250 mA max.	3.27	4.66	2.18	1 Lb.

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Site Power Monitor

Monitor Inputs: 9 Total

Voltage

DC: 3 Ports:

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

AC: 2 Ports:

- 120/240 (90-264) utility power (L-N or L-L)
- 120/240 inverter output (floating)
- Accuracy: +/-2%

DC Current: 1 Port

- +/- 100mv, 100 amp differential shunt voltage
- Read battery charge/discharge current, or load current
- Optional Shunt required for monitor package: P/N 575-2000-0
- Accuracy: +/-3%

Dry Contact Switch Sensors: 3 Ports

- Possible uses: door open, water leak detection, smoke alarm, component fail, breaker trip, high temperature Sensor
- Located outside case of unit
- Range: -40 to +60° C, -40° to +140° F
- Accuracy: +/-0.5° C

Reporting

- Ethernet Port connection: RJ-45, 10/100 auto sense
- HTTP - Web Access, Self-generated Web-page
- SNMP - MIB with Gets, Traps, and Clears
- Alarms - HIGH and LOW trip, 50 max, user-programmable
- Logging - Excel logs created, time stamped, continuous graphing
- SMTP/POP3 - email alerts, POP password
- Data Formats: XML, PDA, WAP (cell phone)
- Optional Console - Multiple Site Monitor with log aggregation and thumbnail camera views
- Remote Firmware upgrades - no need to visit the site.
- Local Data downloading and programming require and RJ-45 cross over cable (not included)

Environmental

- Operating Temperature range -20° C to 60° C

Data Screens

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

Data logging: Remote Or Download Locally:

- 30 days + rolling history with 30 second interval refresh
- CSV file compatible

Images: Ethernet Camera Enabled

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

Diagnostics/Indicators/Controls
Front panel LED's:

- Input Power ON/OK
- System OK
- Flashing Activity Indicator Ethernet port
- System reset button

Protections

- Reverse Polarity
- Input overvoltage
- External 1A slo-blo fuse provided for DC power input

Mechanical

Case: Aluminum, powder coat

Mounting options:

- Wall mount
- DIN-rail
- 19 inch rack mount (via optional bracket)

Input Ports:

- Compression screw terminal block
- 14-26 AWG wire

Optional Accessories

- Video Cameras
- 12 or 24 volt wall plug power supply
- Sensors

Site Monitor & Control

The Site Monitor and Control unit allows you to download real time data, and control devices remotely from your desktop or mobile phone. Remotely activate DC or AC devices, no more driving to a mountain top to cycle power to re-boot a piece of gear, perfom a battery discharge test, or start and monitor the output of a generator.

Numerous power sensors options lets you configure onsite input to meet particular needs. Monitor DC volts/amps, temperature and alarms. Easy to use web based reports utilize Linux® operating system provide real time status, and logging feature stores data graphically for further analysis and forensics. In addition to the power sensors, the system monitors 5 different alarm channels: such as a door, open, smoke, water, etc. Also monitors transmitter signal strength of radios with RSSI output.

Features

- Monitors basic electrical functions: battery voltage, charge/discharge rate
- Monitor critical site environmental conditions: temperature, door open alarms, smoke/ fire detectors, including 2 USB ports for cameras and other equipment
- Set alarm notification points: reported by e-mail or cell using SMS text messages, SNMP traps
- Customize data screens per site input configuration
- Customize monitoring programs and upload to SMC control board
- Remotely control two built-in relays that can be wired to AC or DC functions, such as:
- Start/Stop generator
- Cycle power to re-boot lock-up conditions
- Disconnect batteries or rectifiers for system power test
- Automatically cycle various loads based on site condition parameters you set from desktop, example cycle ventilation fan when ambient temp reaches critical level
- Optional board provides 5 additional controllable relay ouputs, connects into USB port

Model	Powered By	Power Consumption	Dimensions (Inches)			Weight
			H	w	D	
SMC-300	12 - 60 VDC, neg./pos ground	1.2 Watts	4.38	10.25	2.3	3 Lb.

NEWMAR Powering the Network

Specifications

Operating Voltage

12 - 60 VDC, pos. or neg ground

Power Consumption

1.2 Watts

Inputs

- 1 Ethernet (10/1000 Mb/s)
- 3 DC inputs configurable to sense combination of:
  - DC Volts: +/- 100
  - DC Amps: 50 - 1000 A (one 100A shunt provided)
- 4 General purpose I/O pins (3.3 VDC in or out)
- Onboard Temperature Sensor: -25° to 100° C
- 5 alarm pins for external alarm contacts
- 2 USB 2.0 ports
- 2 control relays, 5 amps DC or AC (240V) controlled, each with manual override button for onsite testing
  - Optional board for 5 additional control relays
- 1 console serial port
- Signal strength for radios equipped with RSSI output

Graphic Functions

- Voltmeter
- Ammeter
- Temperature
- Interval: day, week, month, year

Alarm Alerts

- Email
- SMS messaging

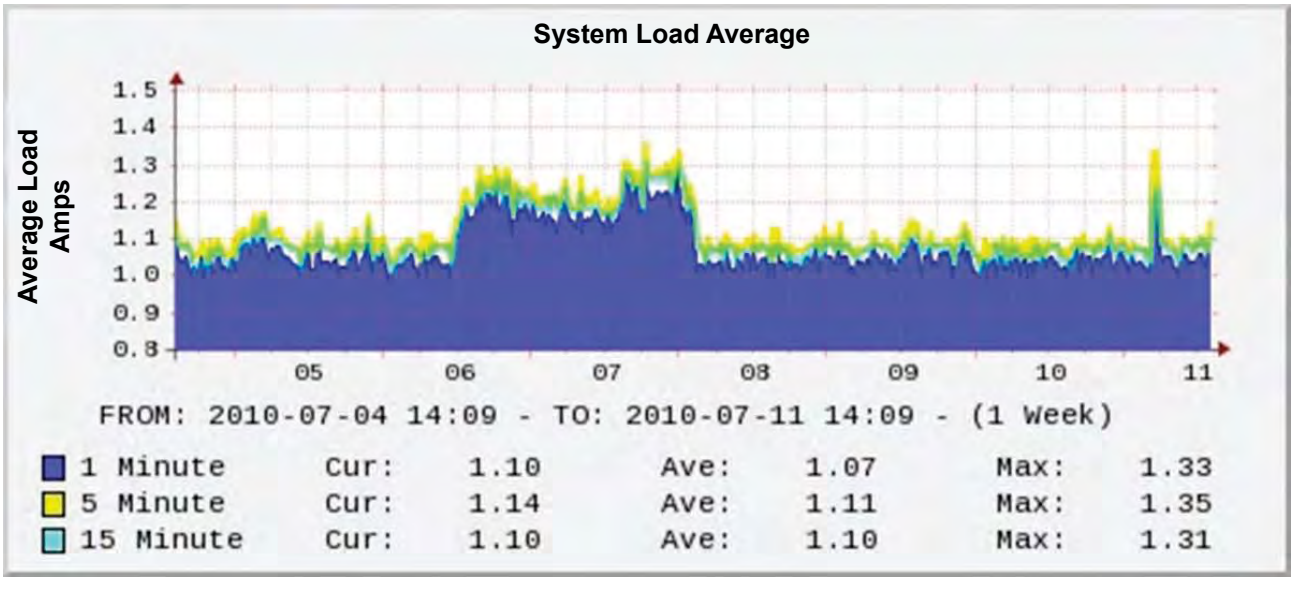
Mechanical

- Compact size: 4.38" H x 10.25" W x 2.3" D
- Mounting: wall, shelf or rack using model BPL-3 rack bracket (3RU)
- End panel wiring ports and fully size removable cover allows easy access to connections
- High impact plastic box with clear cover allows viewing of board mounted status lights
- Operating temp: -30° - +85° C

Options

- USB plug-in board expands relay capacity by 5 additional outputs for remote control of AC/DC equipment onsite, model REB-5

Example of Data Log Screen



Low Voltage Disconnect

Rack Mount

Unity Low Voltage Disconnect & Monitor

Input: 12, 24, or 48VDC

Current Rating: 100 Amps

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Mobile/Wall Mount

Low Voltage Disconnect

Input: 12, 24, or 48 VDC

Current Rating: 30 - 75 Amps

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Rack Mount LVD & Monitor

This 1RU assembly contains numerous DC control and monitoring features that integrate power and distribution components into a highly functional system. Built in features include: low voltage disconnect, digital monitor of voltage and amperage, battery disconnect breaker, and alarm contacts. The digital display monitors bus voltage, battery voltage, system output current, and low voltage connect/disconnect set points. Alarm contacts actuate on low voltage and battery disconnect conditions. Rear panel bus bars provide ample terminal landings for easy integration with rack mount rectifiers, distribution panels and batteries.

Features

- Digital monitor displays system bus voltage, battery voltage, total rectifier amperage, and connect/disconnect voltage set points, and system ambient temperature
- For use with 12, 24, and -48V systems
- Solid state (FET) low battery voltage disconnect with adjustable set points and manual over ride switch for system maintenance/testing, with adjustable low battery alarm contact alerting to impending system shutdown
- 100 amp battery disconnect breaker for system protection and easy testing and maintenance
- Form C alarm contacts
- All these functions in a compact 1 RU unit, minimizing system rack space

Specifications

Electrical

Voltage Range: 8 to 65 vdc

Grounding: Positive or Negative (polarity insensitive)

Battery Breaker: 100 Amps with handle guard

Low Voltage Battery Disconnect: 100 Amp, solid state (FET)

LVD Set Points and Adjustment Range.

VDC	Dis-connect	Connect	Adj. Range
12V	10.4V	12.2V	10-16V
24V	21.0V	24.5V	20-30V
48V	42.0V	49.0V	40-60V

Mechanical

Chassis: Aluminum, black powder coat

Terminals: Plated copper. Landings for up to three rectifier inputs, with separate battery bus

Cooling: Convection

Environmental

Operating Temperature range: 0 to +60° C

Protection

Battery: 100 amp circuit breaker

Reverse Polarity: Polarity insensitive design

Indicators/Adjustments/Alarms

Meter: Display (via front panel selector switch)

- DC volts
- DC Amps
- LVD thresholds: Connect & Disconnect
- Ambient Temperature
- Adjustable brightness
- Default settings restore feature

Meter Power Source Selector Switch: Rectifier/Battery allows meter read if loss of AC or DC power

Alarms/Indicators:

- Form C alarm contact activates on LVD Open or Battery Breaker trip
- Form C low battery alarm contact activates on LVD pre-disconnect condition
- Front panel red LED activates on any alarm condition

Model	Nominal Voltage	Max. Continuous Current	Dimensions (Inches)			Weight (Lbs.)
			H	W	D	
ULM-100	12, 24 or 48, pos. or neg. ground	100 Amps	1.75	19	11	6.25

NEWMAR

Powering the Network

Low Voltage Disconnect

Discharging batteries beyond a critical low voltage can damage the batteries as well as sensitive electronic loads, 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.

Ideal for mobile or wall mount, see **page 71** for rack mount.

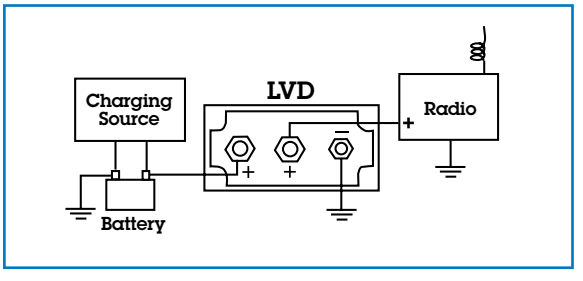
Model	Input Voltage	Contact Current Rating	Factory Set Actuation Points		Adjustment Range
			Disconnect	Connect	
LVD 12-30	12V (Neg Ground)	30 Amps	10.4 VDC	12.2 VDC	9 - 15 VDC
LVD 12-75	12V (Neg. Ground)	75 Amps	10.4 VDC	12.2 VDC	9 - 15 VDC
LVD 24-50	24V (Neg. Ground)	50 Amps	21.0 VDC	24.5 VDC	18 - 30 VDC
LVD 48-30	48V (Pos. Ground)	30 Amps	42.0 VDC	49.0 VDC	38 - 60 VDC

For high current model, see Power ULM-100 - opposite page

Specifications

Operating Temperature: 0-50 °C
Mechanical
Case: Powder coated aluminum
Dimensions (Mounted Vertically, All Models):
5.25" H x 5.25" W x 3.5" D
Weight: 2 Lb.

Typical LVD Installation



DC UPS & Power Control

MDP

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Start Guard

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TMR 30N Timer

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Battery Integrators

Battery Isolators

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Mobile DC UPS: MDP-25

Interfaces With Motorola® 810 Work Stations & MVX 1000 Video Recorders

The 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, it provides a low voltage output warning signal to terminals (such as Motorola® MW 810 work stations and MVX 1000 video recorder) allowing orderly automatic shutdown of the powered device, protecting data and preventing hard drive corruption.

When primary vehicle voltage drops below a critical point, the internal 9AH battery switches on-line in milli-seconds, assuring no interruption to the powered device(s). An internal 3 step, temperature compensated charger maintains the reserve battery at full charge, 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. The unit also contains a noise filter and voltage spike proctection circuit, providing clean power to electronics.

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

Features

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.
- Noise, interference or voltage spikes

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

Provides output warning signals to mobile computers (such as Motorola® MW 810 work stations and MVX 1000 video recorder)

- 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 reserve (isolated) power power source, 12 volts @ 5 amps for 60 minutes, 10 amps for 20 minutes, 25 amps for 8 minutes

NEWMAR Powering the Network

Mobile DC UPS: MDP-25

Specifications

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

Standby Current Draw: <50mA - operating mode, <30 mA sleep mode

Output: 12 VDC

Maximum Load Current: 25 amps

Battery Connect Sequences

- Internal battery switches online when vehicle battery voltage = 10.0 V ± 1.0 V (Vehicle battery disconnects after 3 seconds if low voltage condition persists)
- Vehicle battery reconnects @ 11.5 V ± 1.0 V
- Internal Battery Low Voltage Disconnect: < 9.6 V

Temperature rating

Operating temp: 0 – 50° C

Mechanical

- Aluminum case with access door for easy removal of battery
- Heavy duty mounting suitable for commercial vehicle use

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
- Voltage Spike Protection: Transient energy capability; 100 Joules, 4,000 amps Max (8 x 20 micro seconds)
- Output Signals for terminals (such as Motorola® 810 work stations and MVX 1000 video systems):
- 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

Model	Dimensions (Inches)			Weight (Lbs.)
	H	W	D	
MDP-25	5.75	6	8.5	9.4

Mobile DC UPS: StartGuard

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

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 sensing the starter switch or solenoid is engaged. When the engine is running, the 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.

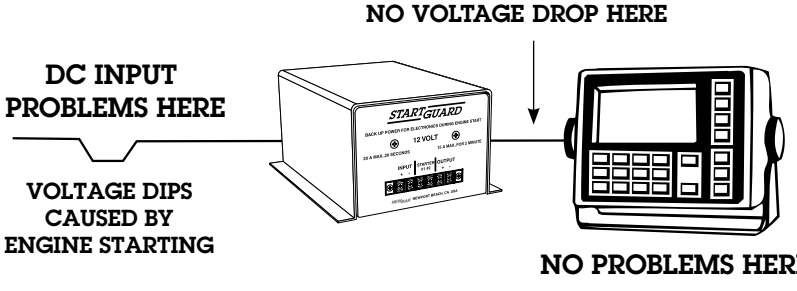
Relay Activation Input Voltage: 7-15 VDC

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)

Provides Voltage Protection During Engine Start



Model	Input	Back-Up Capacity 1 Minute	Back-Up Capacity 2 Minutes	Dimensions Inches	Dimensions Centimeters	Weight Lbs	Weight 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

Powering the Network

Mobile DC UPS: Nav-Pac

Now Available in 24 Volt

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.

Features

- 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

Specifications

Output: 12 Volt @ 20 amps max.
24 Volt @ 15 amps max.
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)

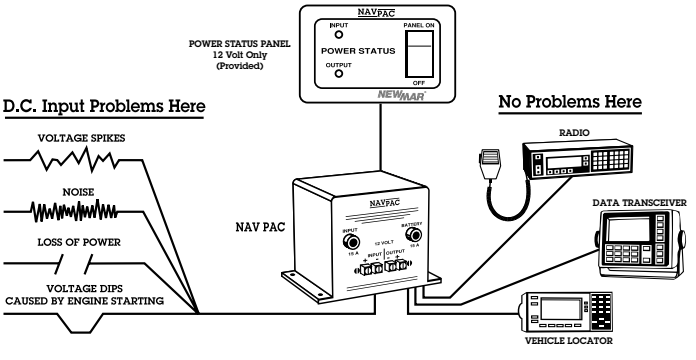
Size (H x W x D):
12V: 5.25" x 6.2" x 7.4" (13.3 X 15.7 X 18.8 cm)
24V: 6.0" x 6.75" x 7.5" (13.3 x 17.14 x 19 cm)
Weight: 12V: 5.9 lbs. (2.7 Kg.)
24V: 8 lbs. (3.6 Kg.)

Panel Dimensions: 3.5" W x 2" H (8.9 x 5.1 cm)
U.S. PATENT #: 5172292

Back-Up Power	
12V	**24V**
8A for 15 minutes	8A for 15 minutes
12A for 8 minutes	12A for 8 minutes
18A for 2 minutes	15A for 2 minutes
20A for 1 minutes	----------

Model	Description
Nav-Pac-20	Nav-Pac, 12V, 20 Amps
Nav-Pac SW	Nav-Pac, 12V, 20 Amps with On/Off Switch
Nav-Pac-24V	Nav-Pac, 24V, 15 Amps

Provides Continuous Voltage Protection



NEWMAR

Powering the Network

DC Power Conditioners

12-12-3I

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.

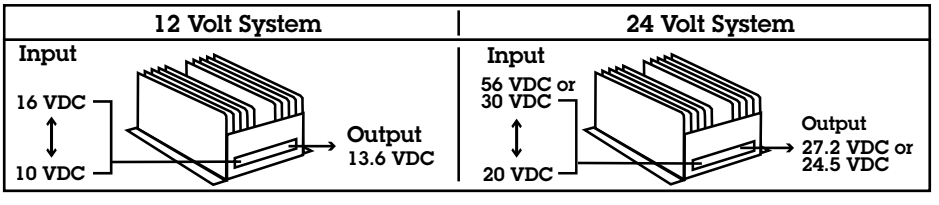
These converters provide total input/output isolation, virtually eliminating conducted line noise and permitting connection of negative ground loads to positive or floating ground systems, or vice versa. They can also be modified for use as battery chargers, allowing maintenance of a battery at a great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

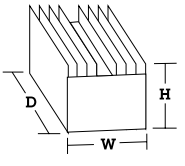
Application Benefits Include

- 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 (contact factory for details)

- Operation as a battery charger
- Parallel/redundant operation
- Non-standard output voltage





Model	Input voltage	Output			Case Size (H x W x D)		Weight	
		Voltage	Amps Intermittent	Amps Continuous	inches	Centimeters	Lbs.	Kg.
12-12-3I	10-16	13.6	3	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	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	8	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	20	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	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	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	5	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	10	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 & Automatic Power Selector

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 making them 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.

Filter Features

- Heavy duty construction
- Operate on 6-48 VDC systems
- Integral mounting flanges for secure installation
- 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

Model	Description
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

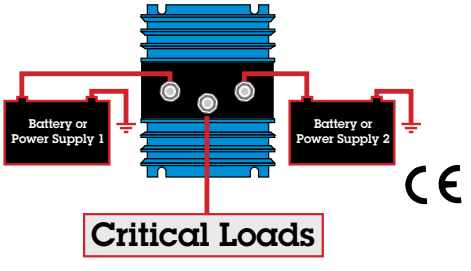
APS-70

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.

Typical Installation



Model	Max Loads	Voltage Rating	Dimensions (Inches)	Weight (Lbs.)
APS-70	70 Amps	6-50 VDC, neg. ground	3.25" x 4.5" x 3.1"	2
APS-160	160 Amps	6-50 VDC, neg. ground	9.0" x 4.5" x 3.1"	5

Power 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.

Features

- Programmable disconnect time limit, 15 minutes to 8 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. Optional ignition sense input resets power 'on' without having to start engine; 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.
- Rugged construction, powdered coated case with epoxy potted components with waterproof time-out setting switches. Designed to withstand 80° C and vibration of engine compartment applications, and perform in demanding emergency vehicle applications
- 30 amp rating: can be applied to multiple auxiliary loads/circuits. Multiple devices can be left on during emergency calls without running engine

Timer Circuit Configurations

Range: 15 min - 8 hours
Increments:
Minutes: 6, 15, 18, 24, 30, 45
Hours: 1, 1.5, 2, 3, 4, 8
Programming: Dip switches on top of unit

Specifications

Rating: 12 volt nominal, 30 amps, 13 mA standby current

Protection: Low and high voltage disconnect,
Low < 10.5V with 10 second delay
High > 15.0V with 3 second delay

Operating Temperature: -20 to +80° C

Mechanical

Case: Powder coated steel with epoxy potted components

Size: (H x W x D): 1.25" x 4.25" x 2"

Weight: 1Lb.

LED's Indicate Output Status

Present, Ok
Present, On Timer
Disconnected, Timed Out
Disconnected, Low Voltage

Wiring

Input

- + DC (fuse provided)
- - DC
- Ignition sense

Ouput

- + DC to loads

Model	Dimensions (Inches) H	W	D	Weight (Lbs.)
TMR-30	1.25	4.25	2	1

Battery Integrators & Isolators

Battery Integrators

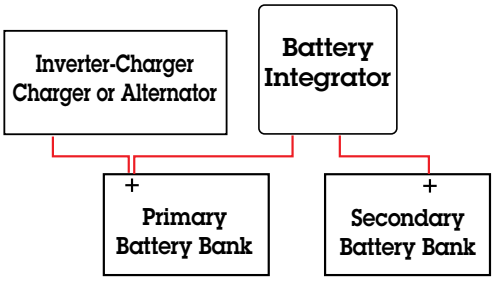
Charging multiple battery banks without use of diode isolators dictates that the batteries be connected or "integrated" only whenever a charge voltage is present so that they may be charged simultaneously, then disconnected or "isolated" when in use to allow for selective discharge and avoid having the secondary or standby battery drain into the primary battery.

Battery Integrators perform this function automatically, acting as a "smart" switch to connect independent battery banks only when a charging voltage is present. Otherwise, they are isolated, and discharge between banks is prevented.

The Battery Integrator causes no voltage drop in the charging system, while the multiple batteries are charged as a single bank whenever a charging source of approximately 13.2 VDC or 26.4 VDC or greater is present (depending on model).

When the alternator or charger is off or a large load causes the voltage to drop below the disconnect point the unit breaks the common tie between the banks. This allows selective battery discharge and prevents "dumping" of a higher-charged bank into a lower-charged bank. The unit may also be remotely activated to connect other batteries through the key starter or a manual switch to provide an added "boost" from the secondary battery whenever the starter is engaged and the unit senses there is sufficient voltage in that battery to provide an assist.

Typical Installation



Model	Voltage
BI-100	12 VDC, 100 Amps Max.
BI-200	12 VDC, 200 Amps Max.
BI-24-100	24 VDC, 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

Model	Alternator Inputs	Battery Bank Outputs	Alternator Amps
1-2-70	1	2	70
1-3-70	1	3	70
1-2-120	1	2	120
1-3-120	1	3	120
2-3-70	2	3	70
2-3-120	2	3	120
1-3-165	1	3	165

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.

Rack Mount Accessories

Battery Disconnect Panels

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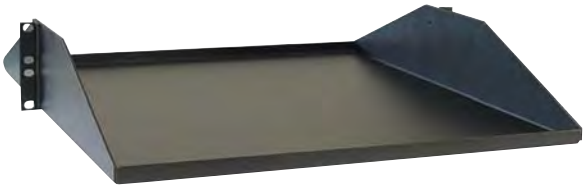

Battery Trays

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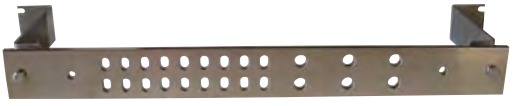

Bus Bars/ BBA-800 / GB-19

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Misc – QCK / RRC

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Battery Disconnect Panels

BDP-1

- 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 2UR rackmount panel
- Auxiliary contacts (form C) provide tripped breaker signal to power plant monitor
- Adapts for 19" racks
- Voltage Rating: 12, 24 or 48 VDC

Model	Battery Strings	Available Amperage
BDP-1	1	50, 75, 100
BDP-2	2	50, 75, 100

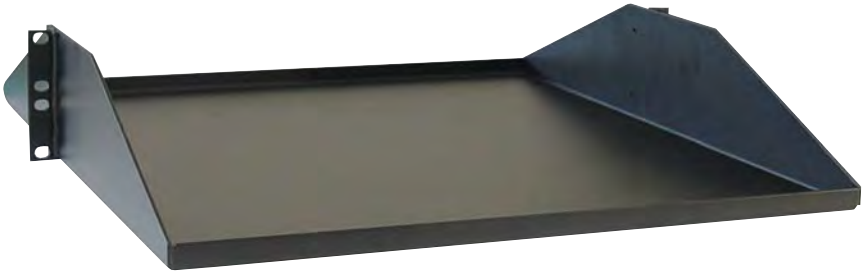
125 to 400 Amp panels available by special order - contact factory

We can supply your battery requirements, see **page 49** for battery ordering information.

BDP-2 wired for 24V application

Battery Trays & Equipment Shelves

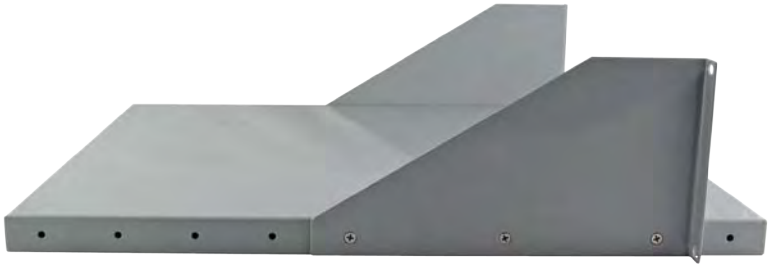
Battery Trays



- 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

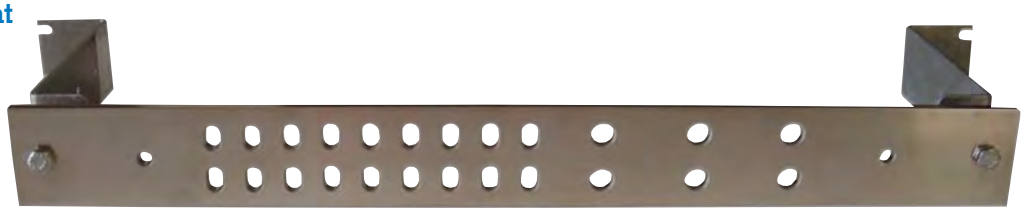
Ventilated Equipment Rack Shelves

- 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

Bus Bars

Rack Mount



BBA-800

- 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 and rear rack bracket
- 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
- Dimensions: 19.5" x 2" x 1/4"
- Projection from rack: 7.5"
- Weight: 4 Lbs.

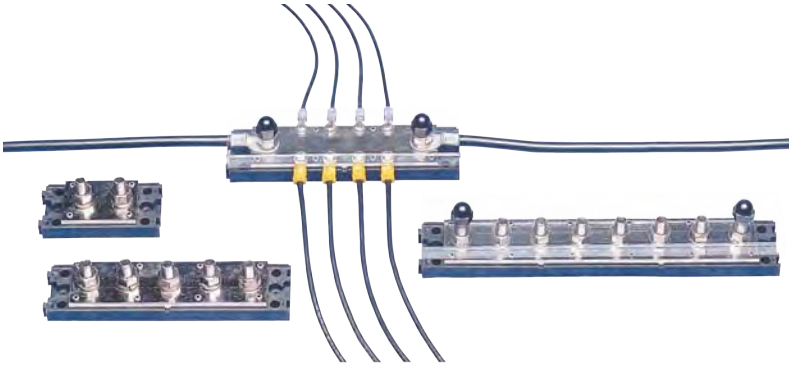
GB-19

- Copper bus bar for (unplated)
- 100 amp rating
- 14 ea. 1/4" landing points
- Installer must supply insulating stand-offs
- Tie bar provided for connecting to adjacent racks
- Designed for 19" racks
- Dimensions: 19.3" W x 0.75" H x 0.15" D
- Weight: 1 Lb.

Mobile Mount

Ideal as a DC ground tie point or positive bus, these heavy duty, 500 amp rated bus bar assemblies feature 5/16" studs on 1" centers in 1/4" thick copper bar for common connection/distribution of large wire gauges and accommodate 5/16" ring terminals.

- Insulated base (reinforced nylon resin) with clear protective cover
- Ideal power tie point when adding batteries, electonics and accessories to vehicles



Model	Qty. of 5/16" Studs	Size
BB-2	2	3-1/16" x 1 1/2"
BB-2/8	2 plus 8 - #8 screws	6-1/16" x 1-1/2"
BB-5	5	6-1/16" x 1-1/2"
BB-8	8	9-1/16" x 1-1/2"

Quick Connects & Rear Rack Covers

Quick Connect Wiring Kits

- Designed specifically for use with NEWMAR PM Series Power Modules and Power Function Manager (see pages 24-25) in stacked rack configuration.
- Allow for quick installation and removal of rectifiers
- Wiring harness is fitted with "Anderson" quick-connect and ring lug terminals; all wires tie-wrapped into proper position for quick and easy installation.
- Simplifies parallel wiring multiple modules
- Facilitates "hot" change-out of modules without system shutdown

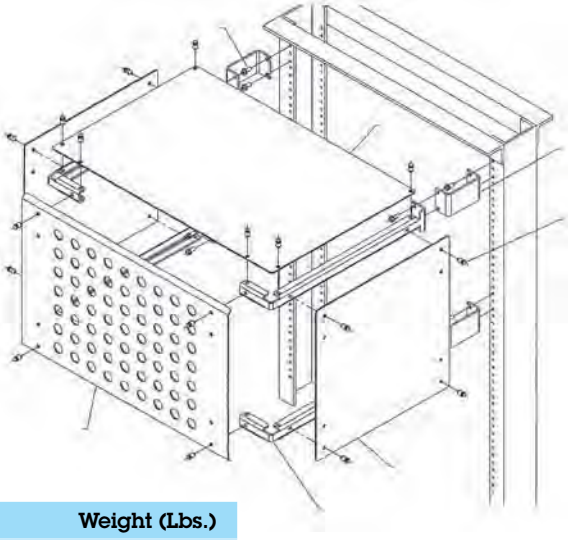
Models	Description	AWG	Weight
QCK-3	for up to 3 Power Modules, 70A rating	6	3 Lbs.
QCK-3A*	for up to 3 Power Modules, 80A rating	4	3 Lbs.
QCK-6	for up to 6 Power Modules, 70A rating	6	4 Lbs.
QCK-6A*	for up to 6 Power Modules, 80A rating	4	4 Lbs.
CCK-4	for up to 4 Power Modules (2200 Watt)	**6**	**6 Lbs.**

** PM-12-80 - only use QCK-3A or QCK-6A*

CCK-4 Installation View

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
- May be installed at 14" or 17" rear depth
- Multiple covers may be stacked to accommodate system height
- All mounting hardware included



Model	Rack Height (1RU = 1.75")	Rack Width	Weight (Lbs.)
RRC-3-19	3 RU	19"	4
RRC-7-19	7 RU	19"	5
RRC-3-23	3 RU	23"	5
RRC-7-23	7 RU	23"	6

Communication Accessories

Speakers/Antenna Switches

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Phone Com

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Radio Covers

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Speakers & Antenna Switches

Indoor/Outdoor Paging Speakers

PA-60/40
Heavy Duty Commercial

PA-40/20

PA-30/20

PA-8W

Clear, distortion free, waterproof deck horns are ideal for paging and alarm systems. High impact plastic with hook-up wire provided. 8 Ohm. Assembled with stainless steel hardware.

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

Model: CS-201

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

Power: 1.5 kW peak, 1kW continuous

Impedance: 50 ohm

Connectors: S0-239/UHF

Weight: 1 Lb., .5 Kg.

Model: RCS

Remote controlled, 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.

Microphone Clips

Model: Spring Clip

All stainless steel. For securing standard mobile radio microphone.

NEWMAR

Powering the Network

Phone-Com Systems

The Phone-Com intercom system provides direct, wired, point-to-point communication. Voice contact to any phone in the system is as easy as lifting the receiver and pressing the call button. Phone-Com operates on 12 VDC. They are constructed of high-impact plastic and are available in either bright white or traditional black. Wall mounting bracket is provided. Two versions are available:

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

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

Phone-Com Wiring: Color-coded multi-conductor interconnect wire (22 AWG) is available from NEWMAR at any length desired with 5, 10 or 15 conductors. For PI-2, use 5 conductor wire. For PI-10, add 3 to the total number of stations to determine minimum number of conductors required.

Note: Phones are not waterproof and should be installed in a protected location.

PI-2: Two station phone with single call button; sold individually; 2 lbs. (Specify White or Black when ordering)

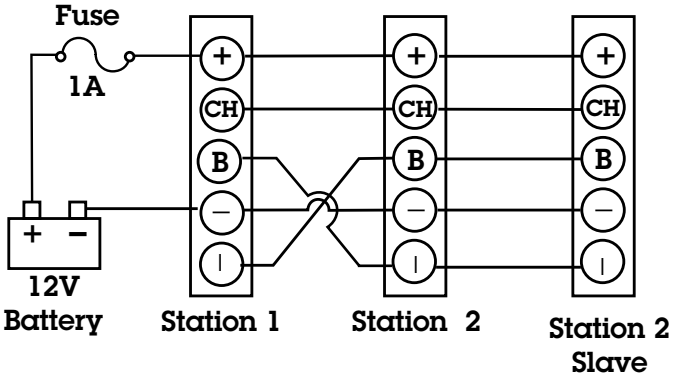
PI-2 SET: Two station phone set, 40' interconnect wire, fuse, lugs, mounting hardware; 5 lbs. (Specify White or Black when ordering)

PI-10: Multi-station phone with 10 call buttons, sold individually; 2 lbs. (Specify White or Black when ordering)

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

BUZZER: Optional external buzzer for use in high-noise areas

2 Station Example
Wiring Diagram with Station 2 with Slave



Powering the Network

Portable Radio Covers

AQ Series Waterproof Radio Covers

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!

Models

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

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

Dimension 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

Model	A	B	C	Weight
AQ-10L/R	13.3"	6.1"	4.1"	1 Lb.
AQ-20L/R	15.7"	7.8"	5"	1 Lb.

Installation Accessories

Junction Boxes

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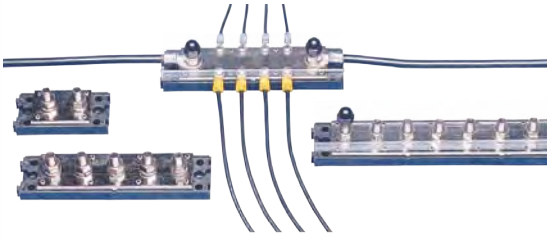

Terminal Strips / Bus Bars

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Thru-Dex

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Junction Boxes

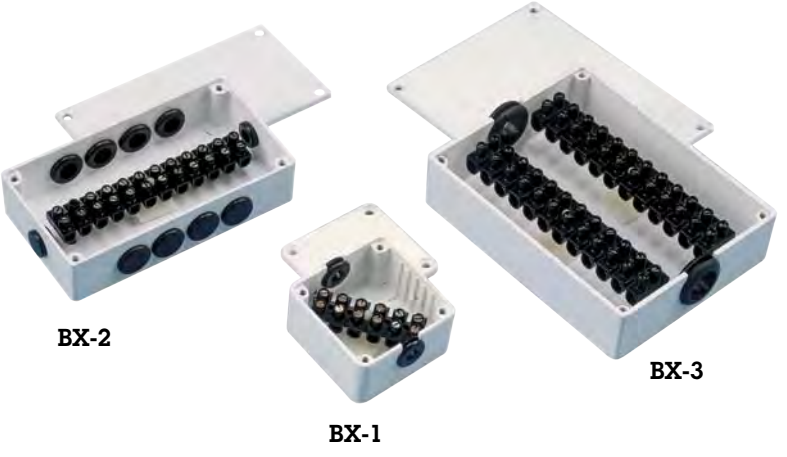
PX Series Junction Boxes

- 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

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

EX Series Electrical Enclosures

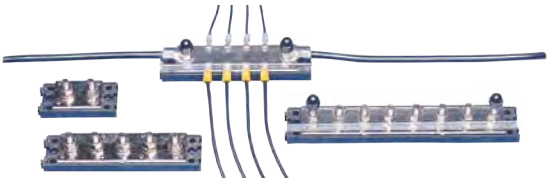
These polycarbonate enclosures provide functional and professional protection for wire connectors, terminal blocks, relays, solenoids, fuses, etc. In addition, instruments, switches and panels can be surface mounted to the cover, as there is ample space for rear projection and wiring.

The watertight enclosures have gasketed covers with captured non-corrosive securing screws. and an internal base plate with stand-off mounts for securing components inside the enclosure.

Model	Size L x W x D (inches)	Knock-Outs (size cross-reference below)
EX-373	7.09 x 3.7 x 3.19	14 ea. PG-16
EX-474	7.09 x 4.33 x 4.37	16 ea. PG-16, 4 ea. PG-21, 2 ea. PG-29
EX-1074	7.09 x 10.0 x 4.37	24 ea. PG-16, 8 ea. PG-21, 4 ea. PG-29

Terminal Strips & Bus Bars

Bus Bars

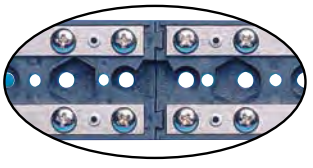


Ideal as a DC ground tie point or positive bus, these heavy duty, 500 amp rated bus bar assemblies feature 5/16" studs on 1" centers in 1/4" thick copper bar for common connection/distribution of large wire gauges and accommodate 5/16" ring terminals.

- Insulated base (reinforced nylon resin with clear protective cover
- BBA-800 - rackmount see **page 82**

Model	Qty. of 5/16" Studs	Size
BB-2 3	2	1/16" x 1 1/2"
BB-2/8	2 plus 8 - #8 screws	6-1/16" x 1-1/2"
BB-5	5	6-1/16" x 1-1/2"
BB-8	8	9-1/16" x 1-1/2"

Terminal Strips



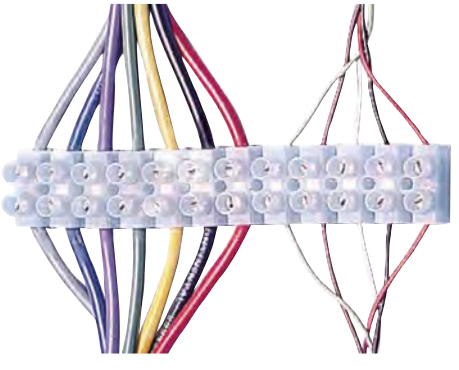
Strips Interlock for Expansion

- Use as a common negative/neutral bus for AC or DC systems. Dual terminal strips in 4 or 8 screw positions on 3/4" centers are secured to a high density insulated base. All hardware, bus material and fasteners are nickel-plated brass.
- Interlocking bases allow use of multiple terminal strips and bus bars (described below) to produce secure and neat wiring assemblies. The terminal strip bases have provisions for either #8 or #10 mounting screws, and no conductive parts in the base are exposed to the mounting surface.
- # 8 screw terminals
- Bus bars rated to 100 amps

Model	Total # of Base Terminals	Size
TS-2x4	8	3-1/16" x 1-1/2"
TS-2x8	16	6-1/16" x 1-1/2"

Connector Strips

Molded nylon encases 6 or 12 pairs of connectors that use screw compression to secure wires without use of lugs. ideal for electronic installations. Brass barrels capture wires and are held in place with a stainless steel "finger" compressed by a screw. The screw does not make contact with the wires, protecting the copper strands from cuts and breakage. Same connector strip used in BX Series boxes.



- 3 Sizes: ranging from 6 to 16 gauge strips are easily cut to meet wiring requirements and space limitations.

Model	# of Terminal Pairs	Max Wire Gauge	Max Amps*	Size (L X W X H)
CS-1	12	16	6	3.75" x .675" x .5"
CS-2	12	14	10	4.5" x .75" x .75"
CS-3	12	12	16	5.5" x .875" x .8"

**Per set of terminals*

RA Series Right Angle Waterproof Feed-Thru Fittings

New!

Route cables at 90° through vertical and horizontal surfaces with wall hugging low profile design that keeps cable secured close to the surface reducing intrusion with personnel or other equipment / cables.

Molded of nylon, the Sculpted shape has no sharp edges and provides radiused 90° feed-thru bend in cables without damage.

Easy installation: slide silicone compression rings on cable, mount base piece with waterproof gasket then attach sealing end cap to create an IP 65 waterproof seal. Note cable must be routed without end connector attached.

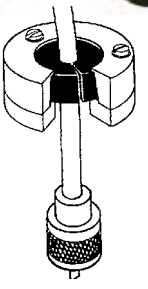
Three models to accommodate wide range of cable diameters.

Model	Cable Diameter Range (Inches)	Dimensions (Inches)
RA-1	0.1 - 0.25	2.17 x 1.65 x 0.63
RA-2	0.27 - 0.35	3.23 x 2.44 x 0.95
RA-3	0.39 - 0.47	3.23 x 2.44 x 0.95

CCX Series Waterproof Feed-Thru Fittings

The entry hole is pre-drilled in seal with slit edge allowing feed through of cable with factory installed connector attached; multiple glands cover a wide range of cable sizes. One CCX fitting is required for each cable.

- Create a 100%waterproof seal when routing cables through communication huts, cabinets, vehicle roofs, etc.
- Entry hole predrilled in seal with slit to edge
- Allowing installation/removal with connector still attached
- Rugged weatherproof nylon housing with neoprene seal

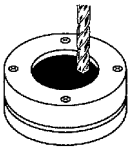


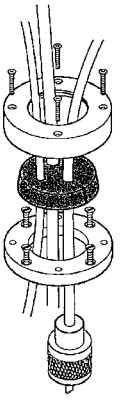
Model	Cable Diameter Range	Max Connnector Diameter
CCX-R	.47"-.59"	1.57"
CCX-S	.35"-.55"	.83"
CCX-T	.18"-.35"	.83"

DX Series Feed-Thru Waterproof Fittings

Provided with solid neoprene cable gland, installer drills holes and slits as required to accomodate cable with or without factory installed connector. Multiple cables may be passed through a single fitting.

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





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

**Aluminum Housing*

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Powering the Network

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www.newmartelecom.com

P.O. Box 1306 Newport Beach, CA 92663
2911 W. Garry Ave, Santa Ana, CA 92704
Phone: 714-751-0488 ▪ Fax: 714-957-1621
E-Mail: sales@newmarpower.com

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