NEWMAR®

Powering The Mobile Network

Transportation

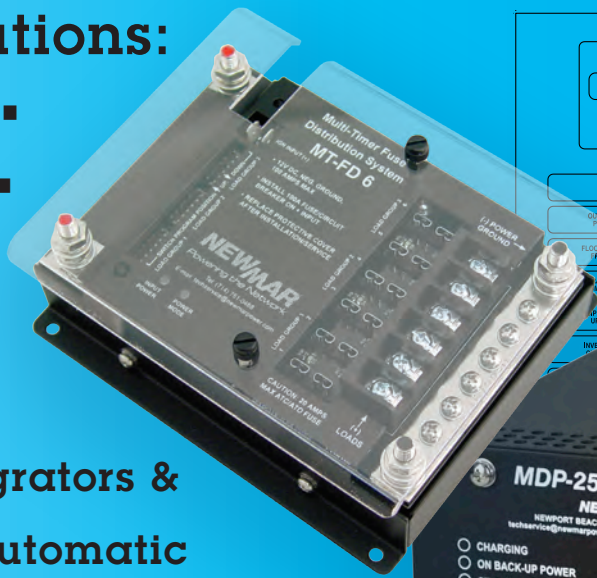
Specialty


Public Safety


Industrial

Mobile DC Power Solutions:

DC UPS ▪ Battery Chargers ▪ Power Supplies ▪ Inverters ▪ DC Converters ▪ DC Power Stabilizers ▪ Distribution ▪ Low Voltage Disconnects ▪ Power Timer ▪ Battery Integrators & Isolators ▪ Noise Filters ▪ Automatic Power Selectors ▪ Solar Panels ▪ Custom Electrical Panels ▪ Meters ▪ Accessories



2015-16

Powering
The Mobile Network
Solutions

DC UPS
Input: 12 & 24 VDC
Output: 12 & 24 VDC, 5 - 20 Amps

Battery Chargers
Input: 120 & 240 VAC
Output: 12 & 24 VDC, 7 - 95 Amps

AC-DC Power Supplies
Input: 115 & 230 VAC
Output: 12 & 24 VDC, 8 - 35 Amps

DC-AC Inverters
Input: 12 & 24 VDCVoltage/Power Range:
Output: 12 & 24, 1,000 - 4,800 Watts

DC-DC Converters
Input: 12, 24, & 32 VDC
Output: 12 & 24, 3 - 35 Amps

DC Power Conditioners
Input: 12 & 24 VDC
Output: 12 & 24 VDC, 3 - 10 Amps

DC Power Distribution
Input: 12 VDC
Output: 12 VDC, 100 Amps

Low Voltage Disconnects
Input: 12, 24 & 48 VDC
Current Rating: 30 - 75 Amps

Power Control
Power Timer, Battery Isolators & Integrators, Noise Filters, Automatic Power Selectors

Solar Panels
Output: 12 & 24 VDC, 1.2 - 7.1 Amps

Custom Panels
AC, DC, & AC/DC

Meters
AC, DC, Generator & Engine

Accessories
Junction Boxes, Thru-Dex Fittings, Bus Bars, Terminal & Connector Strips, Emergency Relay/Charger, Phone-Com Systems

NEWMAR®
Powering The Mobile Network

DC UPS

Battery Chargers


Heavy Duy Power Supplies

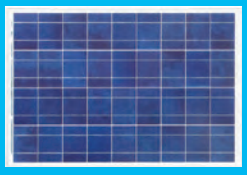

DC-DC Converters

Inverters


Power Distribution

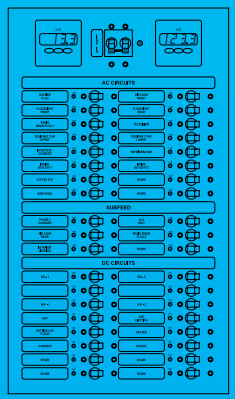
Meters

Low Voltage Disconnects


Solar Panels


Power Control


Accessories


Custom Electrical Panels

DC UPS: Mobile Data Power

The Mobile Data Power, model MDP-25.0, is a DC UPS that solves the common problem of lengthy reboot sequences, system crash, data and hard drive corruption in mobile computer work stations due to a low voltage and loss of power as a result of intermittent or poor vehicle battery condition. In addition, the MDP provides a low voltage output warning signal to terminals (such as Motorola® MW 800 series work stations) allowing orderly automatic shutdown of the powered device, protecting data and preventing hard drive corruption.

Utilizing a high speed sensor circuit, when primary vehicle voltage drops below a critical point, the internal 9AH battery is switched on-line in milli-seconds, assuring no interruption to the powered device(s). The MDP-25.0 has an internal 3 step, temperature compensated charger that maintains its reserve battery at full charge, ready to go on-line when a fault or degradation of primary vehicle battery occurs. This functionality assures continued operation of mobile computers under a variety of adverse vehicle battery conditions. An optional timed load feature (TMR), when activated, begins timing when the vehicle battery drops to a 12.0 VDC or less for added battery protection.

Housed in a rugged aluminum case and heavy duty mounting plate, the unit is designed for installation in service and other utility vehicles that require a steady 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.

Optional timed load disconnect feature (TMR)

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 source, 12 volts @ 5 amps for 60 minutes, 10 amps for 20 minutes, 25 amps for 8 minutes

Model	Input Range	Output Voltage	Maximum Load Current	Standby Current Draw	Dimensions			Weight
					H	W	D	
MDP-25.0	10.2 - 15.5V (start-up @ 11.5V)	12VDC	25A	<50mA - operating mode, <30mA - sleep mode	5.75	6	8.5	9.4 Lbs.

General Specifications

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: <9.6V

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
- 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

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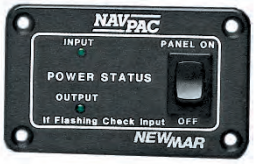
DC UPS: Nav-Pac



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

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 (12V unit only)

Specifications

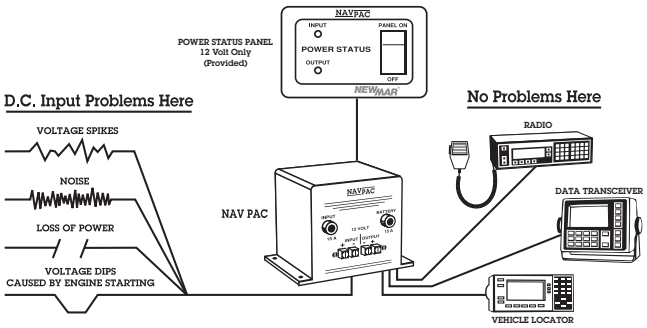
Battery: Sealed Rechargeable 5.0 Amp-Hour, 5-7 years typical life, can be replaced. Low-voltage disconnect circuit protects battery from total discharge. Certified by DOT and IATA for shipment by air.

Noise Filtering: Audio through 200 MHZ

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

Panel Dimensions: 3.5" W x 2" H (8.9 x 5.1 cm); US Patent #: 5172292

Provides Continuous Voltage Protection



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 minute	----------

Model	Input Voltage	Output Voltage	Output Amps	Inches			Centimeters			Weight	
				H	W	D	H	W	D	Lbs.	Kgs.
Nav-Pac-20	13.8 - 14.8 VDC Nom., 15.5 VDC Max.	12 VDC	20 Amps	5.25	6.2	7.4	13.3	15.7	18.8	5.9	2.7
Nav-Pac-24V	27.6 - 29.6 VDC Nom. 31.0 VDC Max.	24 VDC	15 Amps	6.0	6.75	7.5	15.24	17.14	19	8	3.6

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DC UPS: StartGuard

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

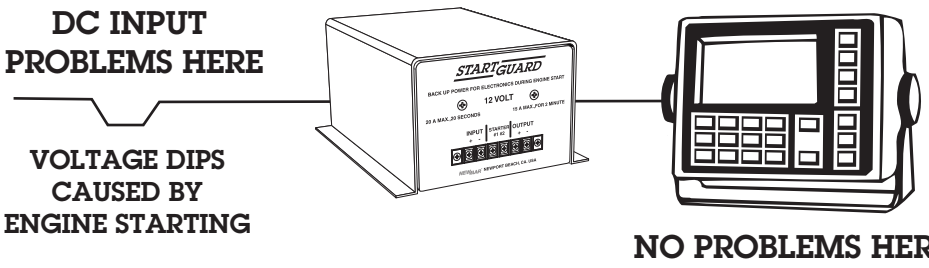
StartGuard solves this problem by providing supplemental voltage to sensitive electronics while the engine is cranked. It contains a sealed rechargeable battery which is switched on-line to electronics when the starter switch or solenoid is engaged. When the engine is running StartGuard automatically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

Specifications

Input Voltage: 13.8 - 14.8 VDC nominal, 15.5 VDC max.
Relay Activation Input Voltage: 7-15 VDC
Output: 20 amps max.
Battery: 12 VDC, sealed rechargeable, 5-7 year life (typical), 5 amp-hour capacity, Certified by DOT and IATA for shipment by air.

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

Provides Voltage Protection During Engine Start



Model	Input	Relay Activation Input Voltage	Back-Up Capacity		Dimensions		Weight	
			1 Minute	2 Minutes	Inches	Centimeters	Lbs.	Kg.
NS-12-20	13.8 - 14.8 VDC Nom. 15.5 VDC Max.	7 - 15 VDC	20 Amps	18 Amps	8.25 x 4.9 x 3.5	20.1 x 12.5 x 8.9	5.5	2.5

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Battery Chargers - Phase Three Series

Phase Three "Smart" battery charging technology is now available in a wide range of power levels, allowing you to select the right size, features and flexibility you require for virtually any application from providing quick recharge of auxiliary batteries in vehicles parked in the station house, to powering continuous loads and maintaining peak charge in battery systems in mobile as well as industrial generator 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 (except PT-7), 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 LED 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. Supplied with 25' cable and plug-in connector. Panel dimensions: 3" H x 4.75" W

Options

Remote Panel, model RP, for use with all models except PT-7

LED's indicate charger output stage. Manual reinitialization of three stage charge cycle. 25' of cable provided. Panel dimensions: 3" H x 4.75" W

Temperature Compensation Sensor, model TCS-12/24

-5 mV per cell °C. 25' of cable provided (40' cable optional)

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Battery Chargers - Phase Three Series

	12 Volt Models					24 Volt Models					
	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
Input VAC (50-60 Hz.)	88-132 or 176-264	85-64	90-132 or 180-264	90-264	90-264	85-264	90- 32 or 180-264	90-264	90-264	207-253	90-264
Input Amps @ Full Load @ 115 VAC	2	2.8	6.5	6.8	12	2.8	6.5	6.8	12	NA	26
@ 230 VAC	1	1.4	4	3.4	7	1.4	4	3.4	7	13	14
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	.7	.95 @ 230V .98 @ 115V
Max Output Amps	7	14	25	40	80	8	13	20	45	60	95
Output Banks	2	3	3	3	3	3	3	3	3	3	3
Battery Capacity (Amp-Hours)	14-70	28-140	50-250	80-400	160-800	16-80	26-130	40-200	90-450	120-600	180-950
Operating Temp.	T-1	T-2	T-4	T-5	T-7	T-2	T-3	T-5	T-8	T-6	T-8
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
Weight; Lbs./Kg.	3.2/1.5	8/4	8.2/4	11/6	15.2/7	8/4	8.2/4	11/6	12.2/6	24.1/11	24.5/11
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
Remote Panel Model	N/A	RP	RP	RP	RP	RP	RP	RP	RP	N/A	RP
Equalize Option	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes
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
Compliance Ref.	CG, CE	CG, CE	CG	CG, CE	CE	CG, CE	CG	CG, CE	EN, CE	EN, CE	EN, CE

Temperature Rating References

Ref.	Temperature	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° C	100% @ 50° C to 75% @ 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

Ref	Inches			Centimeters		
	H	W	D	H	W	D
A-1	10.5	5.0	2.8	26.7	12.7	7.1
A-2	12.5	7.7	4.3	31.8	19.6	10.9
A-3	13.85*	9.5	4.8*	35.2*	24.1	12.2*
A-4	13.8A	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

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

Output Indicator References

M-1: Total output ammeter
M-2: Charge/Float LED
M-3: Total Output Ammeter and charger status LED's/ Alarms

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.

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	
	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
Flooded/AGM	14.2 VDC	13.4 VDC	28.4 VDC	26.8 VDC

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Powering the Network

Heavy Duty Power Supplies

These super-rugged DC supplies are ideal for powering 12 and 24 volt communication equipment in 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 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: over-voltage, current limit; (set @ 105% of intermittent rating), thermal overload and input/output fusing
- Thermally activated cooling fan on "CD" units

Model	Nominal	Output Amperage		Dimensions (H x W x D)						Weight	
12 Volt	Input/VAC	Intermittent	Continuous	Inches			Centimeters			Lbs.	Kg.
115-12-8	115/230	8	5	6.0	4.6	8.5	15.2	11.7	21.6	10	4.5
115-12-20A	115/230	20	8	5.7	4.8	16.3	14.5	12.2	41.4	20	9.1
115-12-35CD	115/230	35	35	6.5	9.5	14.0	16.5	24.1	35.6	32	14.6
24 Volt											
115-24-10	115/230	10	4	5.7	4.8	16.3	14.5	12.2	41.4	20	9.1
115-24-18CD	115/230	18	18	6.5	9.5	14.0	16.5	24.1	35.6	32	14.6
115-24-35CD	115/230	35	35	6.5	13.0	18.75	16.5	33.0	47.6	60	27.3

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)

NEWMAR®

Powering the Network

Inverters

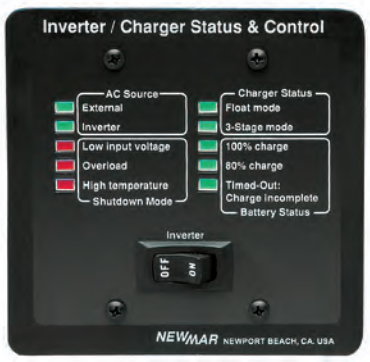
IC Series Inverter-Chargers

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.

- 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
- UL Listed

Model	12-1800IC	12-3000IC	24-2200IC	24-4800IC
Inverter Output:				
Watts (Surge)	4000	6500	6,500	14,000
Watts (Cont.)	1,800	3,000	2,200	4,800
Wave Type	PS	PS	PS	PS
Inverter Input:				
VDC	11 - 14	11 - 14	22 - 28	22 - 28
Max. Amps	180	300	110	240
Charger Input:				
Max. Amps	15	20	15	40
Charger Output:				
Max Amps @ V	85A@12V	105A@12V	40A@24V	105A@24V
Case (H x W x W):				
Case Size Ref.	7.5" x 16" x 15.5"	10" x 17" x 16"	7.5" x 16" x 15.5"	10" x 17" x 16"
Weight (Lbs.)	54	75	54	75

Optional Remote Control and Indicator Panel



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

PS Series Inverters

The PS Series inverters produce high efficient, pure sine wave output from 12 or 24 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.

- 1000, 1500, 2000W models
- Pure sine wave 115V output
- High efficiency ~ 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

Model	Input	AC Out Continuous	AC Out Surge	Dimensions H	W	D	Weight (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
24-1000 PS	24V	1000W @ 115V	2000W	3.46"	7.17"	15.08"	8.8

Remote Panel Included

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DC Converters - Standard Series

Convert 20-50 VDC to 12 or 24 VDC negative ground output for powering communication/ navigation equipment, on negative ground systems. 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 over-voltage protection.

Model	Input Voltage	Output Voltage	Output Amps Intermittent	Output Amps Continuous	Dimensions (H x W x D) Inches	Dimensions (H x W x D) Centimeters	Weight (Lbs)	Weight (Kg.)
24-12-3	17-32	13.6	3	3	3.5 x 3.5 x 1.75	8.9 x 8.9 x 4.5	1	.45
32-12-6	20-50	13.6	6	6	2.8 x 4.2 x 10.4	7.1 x 10.7 x 26.4	2.5	1.1
32-24-6	32-50	24.5	6	6	2.8 x 4.2 x 10.4	7.1 x 10.7 x 26.4	2.5	1.1
32-12-10	20-50	13.6	10	10	4.5 x 5.9 x 11.0	11.4 x 15.0 x 27.9	4	1.8
32-24-10	32-50	24.5	10	10	4.5 x 5.9 x 11.0	11.4 x 15.0 x 27.9	4	1.8
32-12-15	20-50	13.6	15	15	4.5 x 5.9 x 11.0	11.4 x 15.0 x 27.9	5	2.3
32-24-15	32-50	24.5	15	15	4.5 x 5.9 x 11.0	11.4 x 15.0 x 27.9	5	2.3
32-12-25	20-50	13.6	25	20	6.0 x 4.7 x 14.0	15.2 x 11.9 x 35.6	7.5	3.4
32-24-25	32-50	24.5	25	20	6.0 x 4.7 x 14.0	15.2 x 11.9 x 35.6	7.5	3.4
32-12-35	20-50	13.6	35	30	6.0 x 4.7 x 16.0	15.2 x 11.9 x 40.6	12	5.5
32-24-35	32-50	24.5	35	30	6.0 x 4.7 x 16.0	15.2 x 11.9 x 40.6	12	5.5
32-12-50	20-50	13.6	50	40	6.2 x 6.8 x 18.1	15.7 x 17.3 x 46.0	16	7.3
32-24-50	32-50	24.5	50	40	6.2 x 6.8 x 18.1	15.7 x 17.3 x 46.0	16	7.3

Option: Operation as battery charger or parallel redundant operation – derate to continuous duty rating (contact factory)*
Except Model: 24-12-3

Specifications

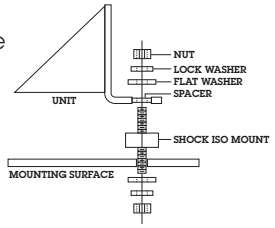
Output: 13.6 VDC (internally adjustable 12.6-14.5) or 24.5 VDC (or specify)
Ripple: 150 mV P-P maximum
Regulation: 1% Line/Load
Duty Cycle Ratings*: Intermittent - 20 minutes max on time, 20% duty. Current limit set at approx. 105% of intermittent rating. Continuous - 24 hours, 100% duty
*24-12-3: 2 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
Model 24-12-3: Full output -25°C to + 30°C; Derate linearly from 100% @ +30° C to 45% @ +50° C
Switching Frequency: 40 Khz
Efficiency: 85% - Typical
Isolation – Output/ Chassis; Input/chassis: 250 VDC
Certification: Carries the CE mark

Option: Extreme Vibration Mounting Kit

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

The kit replaces the standard vibration kit provided with the unit and fits into the unit's mounting flange to act as a "super shock absorber" for electronics in high-vibe applications. It is available to fit all NEWMAR units from 2 to 70 lbs. Specify KIT–L for units which weigh 2–15 lbs. and Kit–H for units which weigh 16-70 lbs. (Except model 24-12-3).



NEWMAR

Powering the Network

DC Converter - Isolated & ISP Series

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
- Power "ON" light
- Polyurethane conformal coating on PC board
- Rugged case designed for high vibration applications

Performance Specifications: Isolated and ISP Series

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

Ripple: 150 mV P-P Regulation: +/- 2% Line/Load Duty

Cycle Ratings*: Intermittent - 20 minutes, max on time, 20% duty, Continuous - 24 hours, 100% duty. *Current limit set at approximately 105% of intermittent rating

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

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

ISP Series: -40° C to +80° C, Thermal shutdown @ 85° C

Efficiency: 85% - typical.

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

Isolated Series: 250 VDC

ISP Series: 1,400 VDC

Options - ISP and Isolated

- Operation as a battery charger or parallel/redundant operation (contact factory)
- High vibration mounting kit (page 8)
- 24 VDC output (contact factory)

Isolated Model	Input Voltage	Output Voltage	Output Amps		Dimensions (H x W x D)		Weight	
			Intermittent	Continuous	Inches	Centimeters	Lbs.	Kgs.
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
48-12-6I	20 - 56	13.6	6	6	4.25 x 5.9 x 7.7	10.8 x 15.0 x 19.6	7	2.7
48-12-18I	20 - 56	13.6	18	10	4.25 x 5.9 x 14.0	10.8 x 15.0 x 35.6	8	3.6
48-12-35I	20 - 56	13.6	35	20	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*

ISP Series

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

ISP Model	Input Voltage	Output Voltage	Output Amps		Dimensions (H x W x D)		Weight	
			Intermittent	Continuous	Inches	Centimeters	Lbs.	Kgs.
36-12-6ISP†	18 - 65	13.6	6	6	4.25 x 5.9 x 7.7	10.8 x 15.0 x 19.6	5	2.3
36-12-18ISP	20 - 65	13.6	18	10	6.0 x 4.6 x 13.7	15.2 x 11.7 x 34.8	8	3.6
36-12-35ISP*	20 - 65	13.6	35	20	6.0 x 6.8 x 16.5	15.2 x 17.3 x 41.9	12	5.5
72-12-6ISP	42 - 90	13.6	6	6	4.25 x 5.9 x 7.7	10.8 x 15.0 x 19.6	5	2.3
72-12-18ISP	42 - 90	13.6	18	10	6.0 x 4.6 x 13.7	15.2 x 11.7 x 34.8	8	3.6
110-12-18ISP	80 - 140	13.6	18	10	6.0 x 4.6 x 13.7	15.2 x 11.7 x 34.8	8	3.6

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

NEWMAR

Powering the Network

DC Converter - Step-Up Series

12-24-16
Standard, Non-Isolated

12-24-18I
Isolated

These "UP" converters produce 24 volts from 12 volt systems and are ideal for managing dual voltage applications on mobile applications without having to install a 24 volt battery and dedicated charging system. Choose from two types depending on your application:

In the Standard, Non-Isolated Series the 12V input and 24V output share a common negative ground and are ideal when installing certain electronics that operate better on 24 volts when a robust 12 volt system exists. Models available in outputs of 7, 16 and 25 amps.

The Isolated Series allows compatibility between positive and negative ground systems, for example installing negative ground 24V electronics on a 12V floating ground aluminum vessel. The isolated series is also a good choice for dual voltage system where noise and interference is an issue. Its input/output partitioning circuit prevents noise on the 12 volt system from being transmitted to the 24 volt side.

Standard, Non-Isolated Series

- Intended for use on negative ground systems
- 10 -15 VDC input range
- Available in 7, 16 and 25 amp outputs
- Current limited, voltage spike suppression, automatic thermal shutdown and recovery

Options for Standard, Non-Isolated

- Operation as a battery charger (contact factory)
- Parallel/redundant operation (contact factory)
- High vibration mounting kit (page 8 for more information)
- Non-standard output voltage (contact factory)

Isolated Series

- Allows positive/negative ground compatibility between 12V battery and 24V accessories
- Wide range input, 10 - 16V, regulates to 24.5V
- Superior noise reduction
- Input/output isolation 250VDC
- Heavy duty powder coated aluminum case
- Available in 6 and 18 amp outputs
- Anodized aluminum case
- Available on special order as battery charger

Model	Input Voltage	Output Voltage	Output Amps		Dimensions (H x W x D)		Weight	
			Intermittent	Continuous	Inches	Centimeters	Lbs.	Kg.
Standard - Non-Isolated								
12-24-7	10 - 15	27.2	7	7	3.5 x 3.5 x 1.75	8.9 x 8.9 x 4.5	1.4	.64
12-24-16	10 - 15	27.2	16	16	3 x 5 x 9.25	7.62 x 12.7 x 23.5	3.35	1.51
12-24-25	10 - 15	27.2	25	25	6.0 x 6.8 x 16.5	15.2 x 17.3 x 41.9	4.1	1.86
Isolated								
12-24-6I	10 - 16*	24.5	6	4	4.25 x 5.9 x 14.0	10.8 x 15.0 x 35.6	6	2.7
12-24-18I	10 - 16*	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 min. start-up voltage, then operates @ 10-16 VDC from 1 amp min. to full load*

NEWMAR Powering the Network

DC Power Conditioners

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.

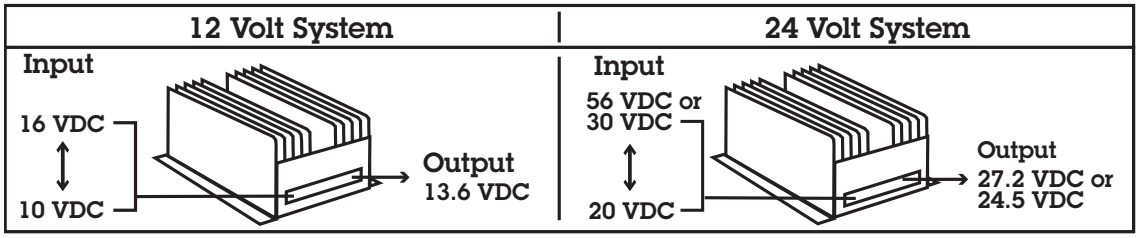
These converters provide total input/output isolation, virtually eliminating conducted line noise and permitting connection of negative ground loads to positive or floating ground systems, or vice versa. They can also be modified for use as battery chargers, allowing maintenance of a battery at a great 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



or

Model	Input Voltage	Output Voltage	Output Amps Intermittent	Output Amps Continuous	Dimensions (H x W x D) Inches	Dimensions (H x W x D) Centimeters	Weight Lbs.	Weight 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	10 6.0 x 6.8 x 16.5	15.2 x 17.3 x 41.9	12	5.5

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

Multi-Timer Fuse Distribution System

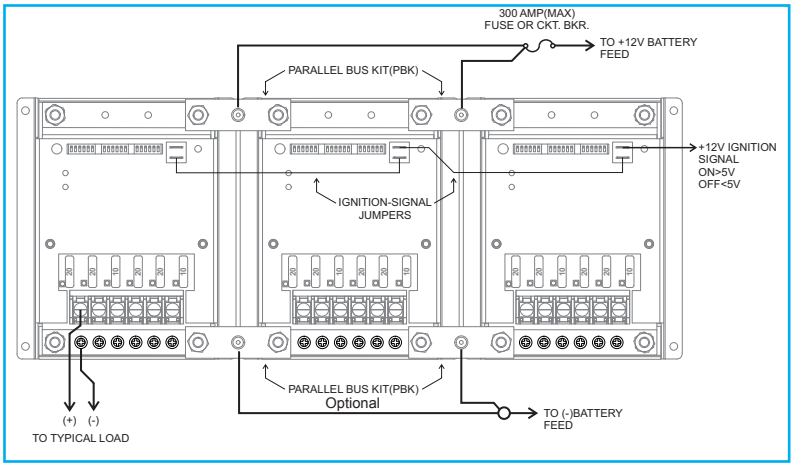
- **Simplifies installation and wiring of vehicle electronics**
- **6 fused circuits with multiple timers provide independent circuit deactivation and conserve battery power:**
  - **Programmable timers disconnects selected loads after ignition is off**
  - **Programmable Low Battery Voltage Disconnect points**
- **Modular design - compact 6 circuit modules easily bus together providing expansion to meet load requirements**

Features

- Quick and easy way to connect, protect, and program power to emergency and service vehicle accessories
- Provides 6 dedicated fused circuits configured in 3 load group to power radios, emergency lights, siren, video, MDT, radar, and more
- 3 independent timers provide flexible circuit activation/ deactivation allow installer to set battery power use priority for each 2 circuit Load Group:
  - Powered Only With Ignition
  - Timed Disconnect
  - Always On With Load Group LVD
  - Always On, No Load Group LVD
- Each circuit is fuse protected with LED indicator which identifies the blown fuse position, simplifying trouble shooting
- Master Low Voltage Disconnect protects batteries from extreme discharge
- Heavy duty studs for battery connections
- Screw terminals for secure load connections
- Increase circuit capacity by wiring multiple units using parallel busing kit
- Sum two fused circuits into one high power (40A) circuit using parallel kit

Model	Circuits	Timers	Max Loads
MT-FD 6	6	3	100A Total, 20A per position

Expanded System Example: 3 x MT-FD-6, 18 Circuits



General Specifications

Input: 12V, neg. ground
Power Consumption: Idle: 8mA, Active: 180 mA/circuit
Maximum Load: Module: 100A, 20A max. per fuse position
Maximum Load: Per System: 3 modules wired in parallel, 18 circuits
Fuse Type: ATC/ATO (not included)
Programmable Shutdown per Load Group: 2 min. – 13 hours
Programmable Disconnect Range: 11.8 - 10.6V DC
Master Low Voltage Disconnect: @ 10.5V (factory programmable 10.0 - 11.8V

Mechanical

Dimensions/Weight: 2.0" H x 5.2" W x 6.2" D/2 Lbs.
Case: Powder coated aluminum
Bus: Nickel plated copper
Protective Cover: Top panel connections and switches
Options:

- Parallel Bus Kit (PBK) for circuit expansion
- Parallel Terminal Kit (PTK) for summing two fused circuits into one

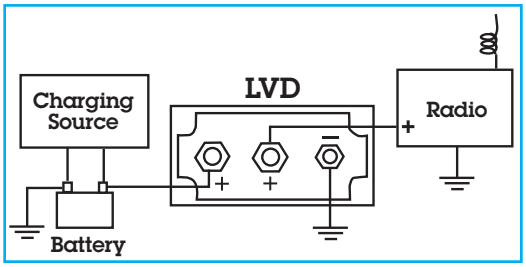
NEWMAR Powering the Network

Low Voltage Disconnects & Power Timer

Low Voltage Disconnects

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.

Typical LVD Installation



Specifications

Operating Temperature:
0 - 50° C
Mechanical: Case:
Powder coated aluminum

Model	Input Voltage	Contact Current Rating	Factory Set Actuation Points Disconnect	Factory Set Actuation Points Connect	Adjustment Range	Dimensions (H x W x D)	Weight
LVD 12-30	12V (Neg Ground)	30 Amps	10.4 VDC	12.2 VDC	9 - 15 VDC	5.25" x 5.25" x 3.5" (Mounted Vertically, All Models)	2 Lbs. All Models
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		

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 specialty 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

Wiring

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

Output
- + DC to loads

LED's Indicate Output Status

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

Model	Description
TMR-30N	12VDC Power Timer

Dimensions (H x W x D):
1.25" x 4.25" x 2"
Weight: 1 Lb.

NEWMAR

Powering the Network

Battery Integrators and 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.

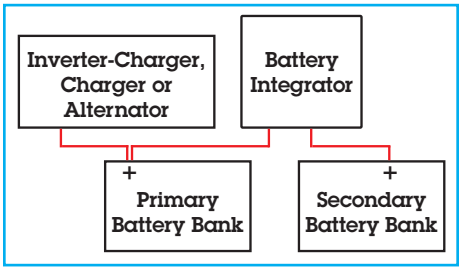
Battery Integrators perform this function automatically, acting as a "smart" switch to connect independent battery banks only when a charging voltage is present. Otherwise, they are isolated, and discharge between banks is prevented.

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.

Model	Voltage	Battery Integration Point	Battery Disconnect Point	Max. Continuous Current	Peak Max. Current	Dimensions (H x W x D)	Weight (Lbs.)
BI-100	12 VDC	13.2 VDC	12.8 VDC	100 Amps	400 Amps	3" x 3.25" x 2.5"	1
BI-200	12 VDC	13.2 VDC	12.8 VDC	200 Amps	600 Amps	4" x 3.3" x 4.1"	2
BI-24-100	24 VDC	26.4 VDC	25.6 VDC	100 Amps	400 Amps	3" x 3.25" x 2.5"	1

Typical Installation



Specifications

Operating Temperature:
Control: -40 to +85° C
Solenoid: -28 to +48° C

Terminals: Battery Connections: 5/16" copper alloy stud

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.

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.

Model	Alternator Sources	Battery Bank Outputs	Max. Alternator Input Capacity	Dimensions (L x W x H)	Weight Lbs.
1-2-70	1	2	70 Amps	3.25" x 4.5" x 3.1"	2
1-3-70	1	3	70 Amps	3.25" x 4.5" x 3.1"	2
1-2-120	1	2	120 Amps	6.5" x 4.5" x 3.1"	4
1-3-120	1	3	120 Amps	6.5" x 4.5" x 3.1"	3
2-3-70	2	3	70 Amps	6.5" x 4.5" x 3.1"	3
2-3-120	2	3	120 Amps	12.5" x 4.5" x 3.1"	5
1-3-165	1	3	165 Amps	9" x 4.5" x 3.1"	5

Specifications

Operating Temperature: -40 to 80° C

Duty Cycle: Continuous rating to 50° C. Derate linearly to 70% @ 80° C

Temp. Rise: 5° C at full rated current (mount vertically for optimum cooling)

Voltage Drop: 0.7V @ 50% load, 0.9V @ full load

NEWMAR

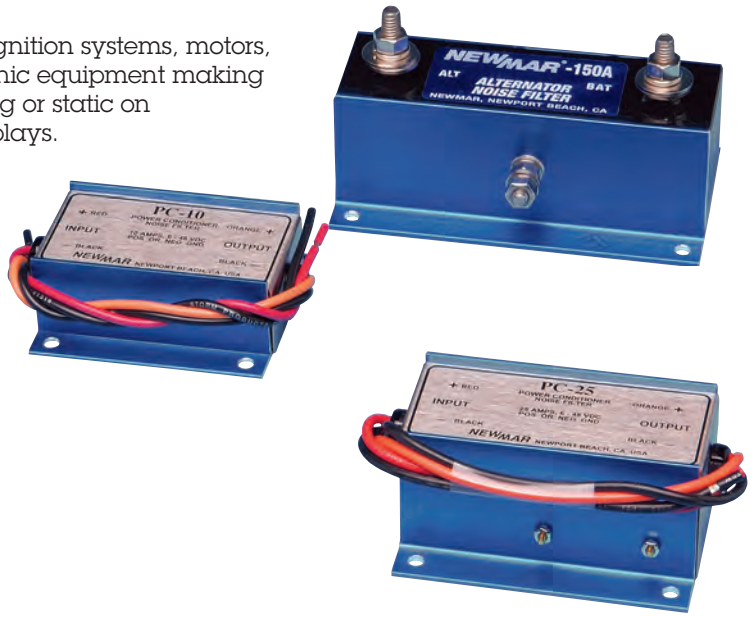
Powering the Network

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.



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

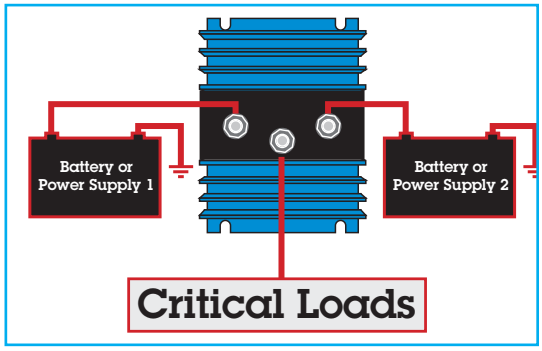
Model	Rating	Installation Location	Filtered Frequencies	Dimensions (Inches)	Weight (Lbs.)
150A	150 Amp	At alternator	70 kHz. - 100 MHz.	3.25 x 5.75 x 3.25	3
PC-10	10 Amp	At affected equipment in "+" and"-" leads	Audio - 200 MHz.	1.25 x 4.25 x 3.0	1
PC-25	25 Amp	At affected equipment in "+" and"-" leads	Audio - 200 MHz.	2.0 x 4.25 x 3.25	2

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	Stud Size	Dimensions (Inches)	Weight (Lbs.)
APS-70	70 Amps	6 - 50 VDC, neg. ground	6mm	3.25 x 4.5 x 3.1	2
APS-160	160 Amps	6 - 50 VDC, neg. ground	6mm	9.0 x 4.5 x 3.1	5

NEWMAR

Powering the Network

Solar Panels

Features

- Industrial grade panel, components and heavy duty mounts
- Numerous size panels match available space (1.2 to 7+A); panels can be wired for higher output
- Voltage controller adapts to properly charging different battery types
- Kits contain parts needed for various types of installations
- 12 and 24VDC systems

Kit Includes

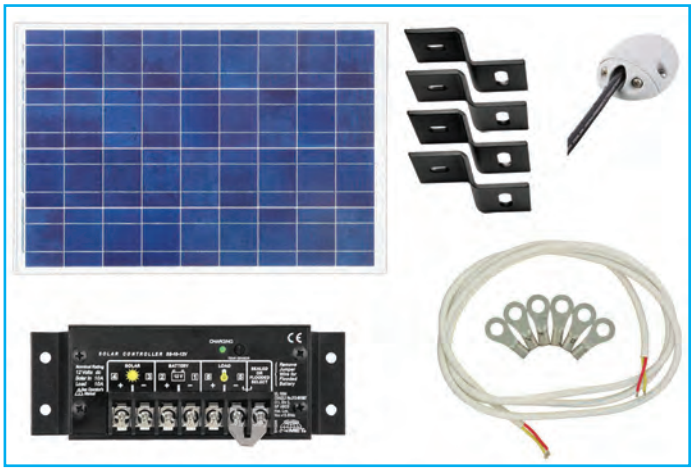
Detailed instructions and parts assuring professional installation, eliminates installer guess work and parts sourcing.

- Industrial grade solar panel with 10 year warranty
- Charge controller with temperature compensated, three step output and battery type selection (Flooded/AGM)
- Heavy duty mounting system
- 20 foot duplex wire, terminals and cable ties
- Waterproof wire feed-through fitting
- Mounting hardware included for various installations

Standard Systems

Model	Electrical		Dimensions			Weight Lbs.
	DC Volts	DC Amps	H	W	D	
SOL 20	12	1.2	0.98"	13.8"	21.7"	6.2
SOL 45	12	2.5	1.38"	21.0"	26.2"	11.0
SOL 65	12	3.7	1.38"	21.3"	38.9"	13.2
SOL 80	12	4.9	1.38"	26.3"	39.9"	19.8
SOL 100	12	5.9	1.38"	26.3"	39.9"	19.8
SOL 120	12	7.0	1.97"	26.0"	57.7"	26.5
SOL-24-40	24	1.2	1.38"	21.1"	26.2"	11.0
SOL-24-60	24	1.7	1.38"	21.3"	38.9"	15.4
SOL-24-85	24	2.5	1.38"	26.3"	38.9"	19.8
SOL-24-120	24	3.6	1.97"	26.0"	57.7"	26.5
SOL-24-210	24	7.1	1.97"	39.1"	64.6"	39.7

Solar Panel Kit



Custom Systems

Use the following selection guide to configure the components needed for a custom system.

Process:

1) Select number and sizes of 12 or 24V solar panels from list above to meet your power and space requirements. *Note, you may mix sizes of panels within voltage range.*

2) Add up the amperage of the selected panels.

3) Select controller that exceeds the total DC amp output of the panels selected.

4) Specify the part numbers of the panels and controller selected on your order. *Note, mounting hardware, wire, and wire feed through fitting is included with each panel.*

12 Volt Controllers

Model	Electrical	
	DC Volts	DC Amps
SC-12-10	12	10
SC-12-20	12	20
SC-12/24-30	12	30

24 Volt Controllers

Model	Electrical	
	DC Volts	DC Amps
SC-24-10	24	10
SC-24-20	24	20
SC-12/24-30	24	30

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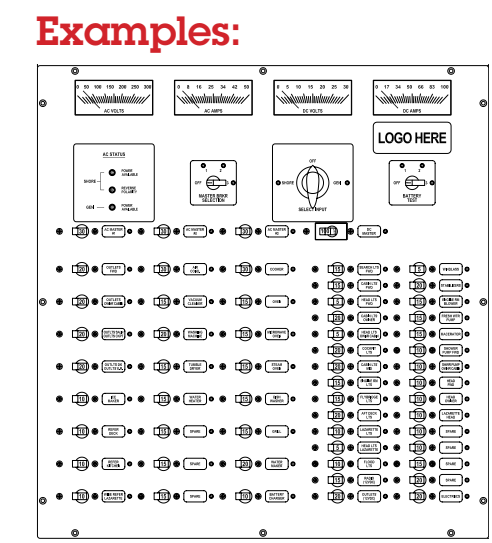
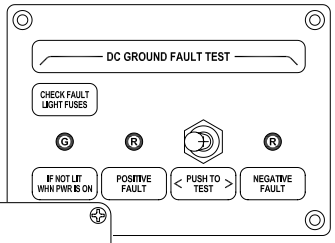
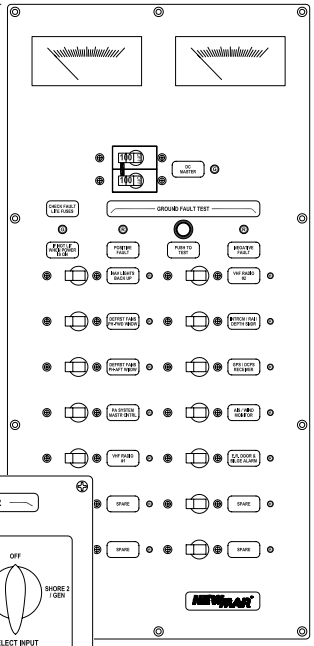
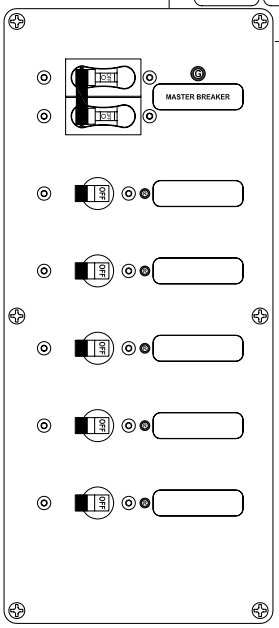
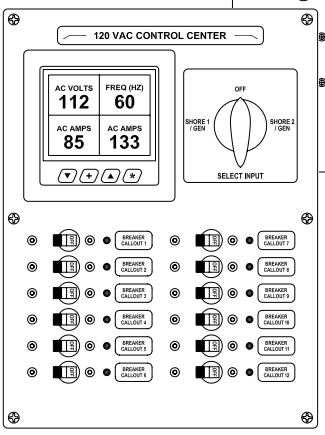
Examples:

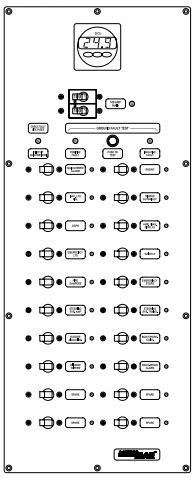


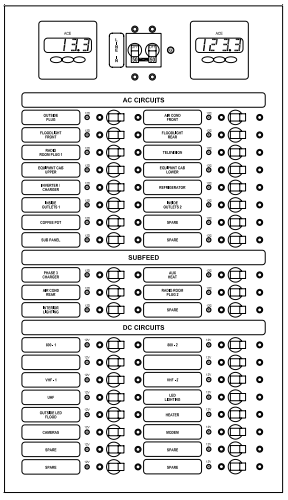


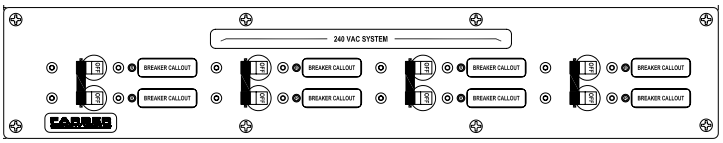












Powering the Network

Digital Meters

These highly versatile digital instruments enable continuous and comprehensive monitoring of 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	Description	Meter Face Dimension
ACE	Displays volts, amps, frequency and wattage of 115/230 VAC systems. High/low volt/frequency alarms. Current transformer included.	2-1/2" x 2-1/2"
ACE-VAF-100	ACE meter, same as above	4-1/4" x 4-1/4"
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" x 2-1/2"
DCE-VAH-110	DCE Meter, same as above	4-1/4" x 4-1/4"
DCV	Displays DC volts for three battery banks. High/low voltage alarms.	2-1/2" x 2-1/2"

Generator Power Monitor

This versatile and compact, 4" x 4" color LED display instrument provides simultaneous read out of generator and shore power data: AC Voltage, Frequency, Amperage of two 120V legs of 240V circuit. Programmable alarm settings on each function produces 85 db audio alert as well as visual red blinking display. In addition, the Generator Monitor logs cumulative generator operation hours with programmable service interval hour settings and notification.

Model	Electrical			Dimensions		
	Operating Volts	Sense Voltage	Max. Power	H	W	D
VAAFH	9 - 33VDC	120/240VAC	36 kW	4.0"	4.0"	2.7"

Engine Function Monitor

The Engine Monitor is a compact, 4" x 4" color LED display that provides simultaneous read out of vital engine data including: DC Voltage, Oil Pressure, Temperature, and Tachometer from J1939 can bus. Programmable alarm settings on each function produces 85 db audio alert as well as visual red blinking display.

Model	Electrical		Dimensions		
	Operating Volts	Input Signal	H	W	D
VOTT	9 - 33VDC	J1939	4.0"	4.0"	2.7"

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Accessories

Thru-Dex PX Series Junction Boxes

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

PX-1

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

BX Series Splashproof 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

BX-3

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 Boxes

- Protective enclosure for wire connectors, terminal blocks, relays, solenoids, fuses, etc.
- Instruments, switches and panels can be surfaced mounted, ample room for rear projection and wiring
- Corrosion resistant polycarbonate case with gasket covers provides water resistance up to IP68
- Knock-outs in numerous sizes on all sides

EX-474

EX-1074

EX-373

Model	Size L x W x D	Knock-Outs Sizes
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

RA Series Right Angle Waterproof Feed-Thru Fittings

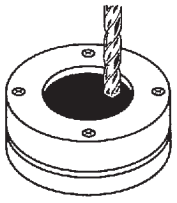
- Route 90° through vetical and horizontal surfaces with wall hugging low profile design, securing cables close to the surface
- Molded of nylon, the Sculpted shape has no sharp edges, providing radiused 90° feed-thru bend in cables without damage
- Easy installation: slide silicone compression rings on cable, mount base piece with waterproof gasket, then attached sealing end cap to create IP-65 waterproof seal

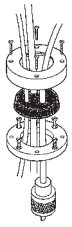
Model	Cable Diameter Range (Inches)	Dimensions (Inches)
RA-1	0.1 - 0.25	2.17 x 1.65 x 0.63
RA-2	0.27 - 0.35	3.23 x 2.44 x 0.95
RA-3	0.39 - 0.47	3.23 x 2.44 x 0.95

DX Series

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. Diameter
DX-2	1.2"	1.2"
DX-3	1.65"	1.65"
DX-5*	2.0"	2.0"





CCX Series Feed-Thru Fittings

- Create 100% waterproof seal when routing cables in mobile applications
- Allow installation/removal with connector still attached
- Rugged weatherproof nylon with neoprene seal
- Entry Hole pre-drilled

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

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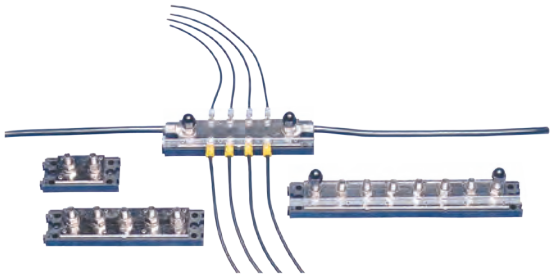
Accessories

Bus Bars



Heavy duty 500 amp nikel-plated copper bus with 5/16" studs on insulating base (re-inforced nylon resin) with clear protective cover.

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

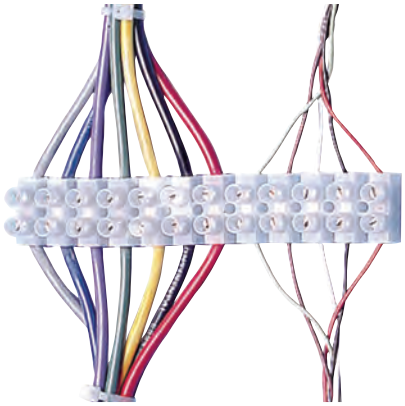
- Use as a common negative/neutral bus for AC or DC systems. Dual terminal strips in 4 or 8 screw positions on 3/4" centers are secured to a high density insulated base.
- Interlocking bases allow use of multiple terminal strips and bus bars to produce secure and neat wiring assemblies. The terminal strip bases have provisions for either #8 or #10 mounting screws, and no conductive parts in the base are exposed to the mounting surface.
- 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"

Strips Interlock for Expansion

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.



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*

Emergency Relay/Charger

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

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

In the event of AC power failure a relay automatically connects the radio to the back-up battery, restoring the system within one second.When AC power is restored the radio is automatically reconnected to the power supply and the trickle charge resumes to the battery.

Model	Amps	
	Int.	Cont.
12-15	15	10
12-35	35	30
24-35*	35	30

**Built to order*

Phone-Com Systems

The Phone-Com intercom system provides direct, wired, point-to-point communication, operates on 12 VDC, constructed of high-impact plastic and are available in either classic white or traditional black. Mounting brackets are provided.

PI-2: Two station phone with single call button; sold individually
PI-2 SET: Two station phone set, 40' interconnect wire, fuse, lugs, mounting hardware
PI-10: Multi-station phone with 10 call buttons, sold individually

PI-10

PI-2

PI-10

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