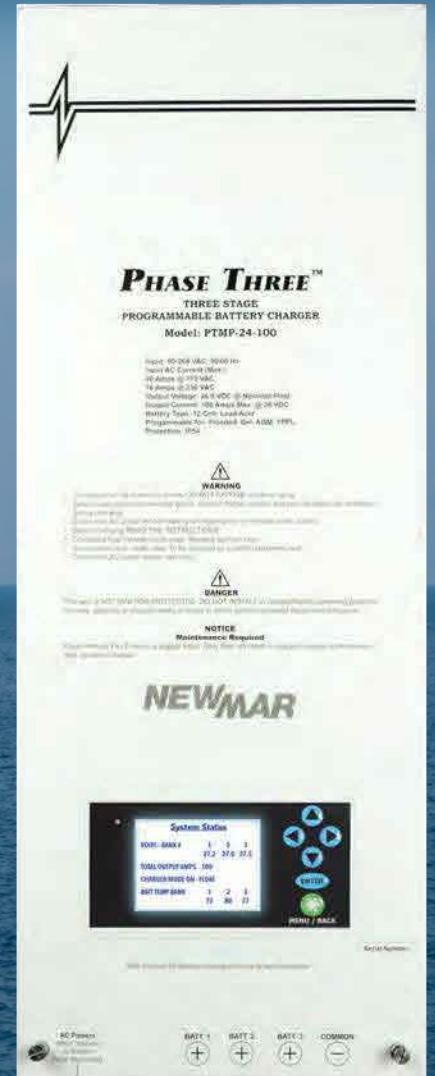


NEWMAR[®]

DC Power OnboardSM

INTRODUCING PTMP SERIES MODULAR / PROGRAMMABLE "VERY SMART" BATTERY CHARGERS



BATTERY CHARGERS • INVERTERS • DC CONVERTERS • POWER SUPPLIES
DC POWER CONDITIONERS • DC POWER STABILIZERS

PTMP Chargers - 24V Modular Programmable



24 Volt, 150 Amp

- **Programmable:**
 - Battery Types
 - Operating & Alarm Parameters
- **Self-Monitoring/Diagnosis Reported On-Screen:**
 - Operational Data
 - Out of Limit Conditions
 - Component Fault Identification
- **Form C Remote Monitor Relay Outputs;**
 - AC Fail, DC Voltage Low/High
- **Onboard Serviceability:**
 - Plug-In Replacement Components
 - Charger Remains Installed On Vessel

The PTMP represents a new level of functionality, reliability, and serviceability in very smart battery charging for critical 24 volt systems aboard work boats, military, commercial, and recreational craft. A menu of pre-programmed battery type charge profiles as well as custom settings option allow user to select or program optimal three step charging voltages and operating parameters. The chargers interact with batteries providing the ideal profile for replenishment and conditioning, resulting in maximum performance and extending service life.

LCD screen diagnostics and system status and alarm conditions, plus remote alarm contacts improves reliability as operators are kept apprised and forewarned of potential system issues. The LCD monitor indicates nature of the service required, yet the charger will rarely need to be removed from the vessel! The front panel hinges upward allowing access to the power module and controller circuits which can be easily removed, and a replacement quickly plugged back in place, specialized techs not required, minimizing down time and service labor expense.

Reliability is further enhanced on the 100 and 150 amp systems via use of multiple power modules, should one fail the system will signal a fault but continue to operate at reduced power output.

Features

- User selection of Pre-programmed charge profiles for multiple battery types. Plus full customization for special requirements
- On-screen status and system diagnostics, with audio alarm
- Independent temperature sensors, 3 battery banks
- 3 step charging for long battery life
- 21 day automatic re-conditioning cycle
- Equalization program
- Remote Status monitoring via Form C relay contacts
- Multiple modules provide redundancy and qualifies as redundant ABS essential service device (100 & 150 amp models)
- Easy front panel access to plug-in modules for quick field service, no need to remove charger from vessel, high tech personnel not required
- IP54 water and dust ingress protection

PTMP Model	24-50	24-100	24-150
Input Amps (115V/230V AC)	14/8	28/16	42/24
Output Amps	50	100	150
Banks	3	3	3
Size (Inches)	23 x 10 x 7	23 x 10 x 7	23 x 12 x 7
Weight (Lbs.)	28	30	35

Preliminary Specifications



DC Power Onboard



PTMP Chargers - 24V Modular Programmable

Operation Status Screen

A 2" x 2.6" Front panel LCD screen provides system status information:

- DC volts per battery bank
- Total charger output amps
- Charge stage mode (bulk, absorption float)
- Battery temperature (per enabled temp probe)
- Recondition cycle in process
- Absorption stage timed out
- Equalize mode time remaining
- Alarm conditions (see self-diagnostics section below for list of alarm monitored functions)

Programmable

Enter charge profile for multiple battery types, and monitoring parameters via front panel key pad, LCD screen or by laptop connection.

Battery program selections include:

- Flooded Cell 1
- AGM
- Flooded Cell 2 (AGM 2)
- Gel
- TPPL (Thin Plate Pure Lead)

Custom settings include:

- Absorption & float voltage
- Absorption stage time
- Absorption stage end amps
- Bulk stage time out
- Max charge amps (AC input limit)
- End of Absorption condition
- Hi/Low DC alarm voltages

Self-Monitoring/Diagnosis

Displayed on-screen with audio alarm when critical condition detected:

- AC Failure
- Charger Over Temp
- Battery Over Temp
- High Charger Voltage Output
- Low Charger Voltage
- Internal Power Module over temp
- Internal Power Module Failure
- Fan failure
- Output Fuse Failure

Form C Remote Monitor Relay Outputs

- AC Fail
- DC Voltage Low/High (set points programmable)

Reliable

Hardened for marine environment:

- IP 54 rating: protected from dust and splashing water
- Cooling air flow ducted to minimize contact with power circuit components
- Conformal coated circuit boards
- High temperature rated circuits to 50° C
- Automatic power reduction in high temp environments
- Redundant power modules ensure continued operation should one fail (100 and 150 amp models)

On-Bulkhead Serviceability

On-screen diagnostic define fault conditions. Hinged front panel access to internal modular plug-in circuits makes replacement easy without removing charger from installed location.

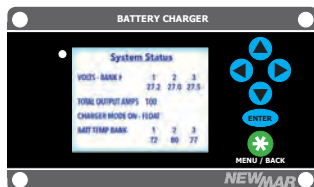
- Module change-out takes only minutes via plug and play configuration
- Technical personnel not required
- No need to remove the charger case from the boat

Options

- Remote installation of LCD display and touch pad.
- Battery Temperature Sensors.



Battery Temp. Sensor



Remote Panel

System Status

```
VOLTS - BANK # 1 2 3
                27.2 27.0 27.5
TOTAL OUTPUT AMPS 100
CHARGER MODE ON - FLOAT
BATT TEMP BANK 1 2 3
                72 80 77
```

System Normal Screen



Programmable by key pad or laptop

System Status

```
VOLTS - BANK # 1 2 3
                22.0 24.8 25.0
TOTAL OUTPUT AMPS 0
CHARGER MODE OFF/FAULT
BATT TEMP BANK 1 2 3
                128 72 80
```

Battery # 1 Over Temp

Alarm Condition Screen



Front panel pivots up providing access to plug-in modules allowing easy onboard service



DC Power Onboard

Battery Chargers - Phase Three Series



12 Volt



"Smart" battery charging technology for 12, 24 and 32 volt systems aboard workboats, military vessels, commercial vessels, and recreational craft. These chargers interact with batteries providing the optimum three stage charge process for fast recovery and conditioning, maximizing performance and extending battery life.

Features

- "Smart" circuitry provides three stage charging: bulk, absorption, float
- Gel-Cell/Flooded Lead-Acid/AGM battery type switch selects optimum charge/float voltages
- Optional sensor adjusts output voltage based on battery temperature (except PT-7)
- Current limiting prevents damage from overloading
- Use as a power supply - can power loads without a battery in-line
- ABS Type Approved battery charger and power supply
- PT-MCU Control/Monitor optional (see page 6)



Installation with optional PT-MCU Control/Monitor

24 & 32 Volt



DC Power Onboard

Battery Chargers - Phase Three Series

	12 Volt				
	PT-7	PT-14W	PT-25W	PT-40U	PT-80
Input VAC	88-132 / 176-264	85-64	90-132 / 180-264	90-264	90-264
Max Output Amps	7	14	25	40	80
Output Banks	2	3	3	3	3
Battery Capacity (Amp-Hours)	14-70	28-140	50-250	80-400	160-800
Case Size Ref.	A-1	A-2	A-2	A-3	A-5
Weight; Lbs./Kg.	3.2/1.5	8/4	8.2/4	11/6	15.2/7
Temp Sensor Type	N/A	TCS-12/24	TCS-12/24	TCS-12/24	TCS-12/24
Remote Panel Model	N/A	RP	RP	EVM	RP



Options Accessories

Remote Panel, model RP (applicable to most models, see matrix)

LED's indicate charger output stage



3" x 4.75"

Temperature Compensation Sensor

See matrix for applicable type per charger model: **TCS-12/24** or **TP**



TCS-12/24

TP Sensor

PT-MCU Control/Monitor

- AC input breaker
- Output voltage adjust
- Digital DC volt meter with alarm
- AC fail contacts (see page 6 for specs.)



Case Size

Ref	Inches		
	H	W	D
A-1	10.5	5.0	2.8
A-2	12.5	7.7	4.3
A-3	14.8	9.5	6.3
A-4	15	9.8	6.1
A-5	15.8	9.6	6.1
A-6	19.5	12	8.2



	24 Volt						32 Volt
	PT-24-8W	PT-24-13W	PT-24-20U	PT-24-45U	PT-24-60W	PT-24-95U	PT-32-25
Input VAC	85-264	90-132 / 180-264	90-264	90-264	207-253	90-264	104-126
Max Output Amps	8	13	20	45	60	95	25
Output Banks	3	3	3	3	3	3	3
Battery Capacity (Amp-Hours)	16-80	26-130	40-200	90-450	120-600	180-950	50-250
Case Size Ref.	A-2	A-2	A-3	A-5	A-6	A-6	A-4
Weight; Lbs./Kg.	8/4	8.2/4	11/6	12.2/6	24.1/11	24.5/11	12.2/6
Temp Sensor Type	TCS-12/24	TCS-12/24	TCS-12/24	TCS-12/24	TP	TCS-12/24	TP
Remote Panel Model	RP	RP	N/A	RP	N/A	RP	N/A

Battery Charger - Phase Three Series Modular

The PTMS charger provides a significant improvement in DC system reliability by utilizing multiple independent charger modules that plug into the bulkhead mounted case, and should a fault occur in one module, the system continues to operate, thus is considered "fault" tolerant.



The system consists of a wall mount case which serves as connection point to AC input and 24V, 3 battery bank output and contains three front-facing power bays, each accommodating a 22.5 amp charger module which slides and locks in place creating a 24V, 67 amp charger. If a module fault occurs, a front panel indicator and alarm relay is activated and the system continues operating on the other modules.

A fourth bay houses the "smart" controller circuit that provides 3 step charging, battery type selector switch, temperature compensation, system status LED's, alarm contacts and indicators. Should the controller suffer a fault, the charger will still operate at full power at float voltage mode. The controller module is also configured for easy plug-in replacement in the field.

Vessel operators appreciate this system approach to reliability and serviceability whereby a fault in one of the modules is easily identified and it can be quickly replaced with an on-hand spare or an exchange unit from the factory, all the while the charging system and the vessel continue to operate.



Redundant, independent charger modules increase reliability - if one malfunctions, the remaining modules continue to operate.

System Specifications

Input Voltage/Frequency: 90-264 VAC, 47-63 Hz,

Battery Type Selector: Lead Acid/AGM/Gel-Cell

Battery Banks: 3

Temperature Compensation Sensor (Optional):

Model: TCS-12/24

Status Indicators

Output OK, No Output, Check System, Battery Too Hot, Total Output Bar Graph,

Remote Monitor Outputs (Form C): AC Fail/Module Fail/Low Voltage

Temperature Rating

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

Mechanical

Case Material: Powder Coated Stainless Steel

Cooling: Forced air per module

Compliances

ABS type approved redundant power system for essential services and as a battery charger, CE Mark, UL Recognized Power Modules



Engine room installation.



Articulated tug barges utilize PTMS Chargers to maintain batteries and supply power to essential services.

Model	Modules Installed	Max Output Amps @ 24V	Max Input Amps @ 115/230 VAC	Dimensions (H x W x D)	Weight Lbs.
PTMS-24-67	3	67	18/9	20.9" x 10.9" x 8.8"	35



DC Power Onboard

PT-MCU & ABC Series Battery Charger

Phase Three - Monitor/Control Unit

Designed for installation in conjunction with most models of PT Battery Chargers, this unit provides additional functionality in monitoring, control, and alarms. It contains a 3 battery bank Digital DC volt meter, a PT charger float voltage adjustment, and AC Master circuit breaker for control and protection of charger input power.



A 10 foot wiring harness is provided for AC input and DC monitor wiring to the charger. The unit carries ABS type approval for Charging Systems, thus providing full compatibility when paired with PT chargers which are also ABS Type approved.

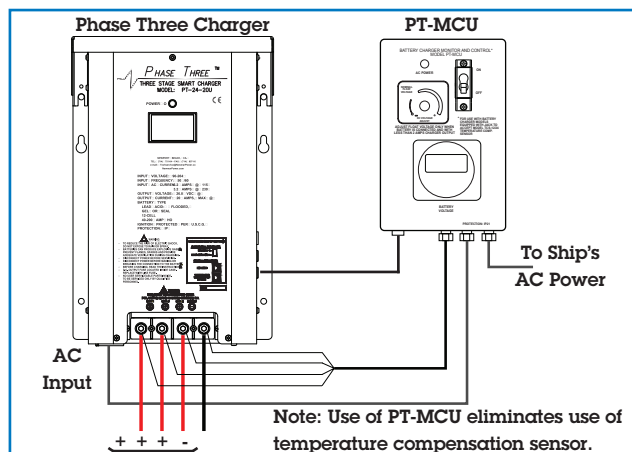
Features

- Digital readout of 3 battery bank voltages to 1/10th volt
- DC high/low voltage alarm with adjustable set-points
- Output float voltage adjustment pot; permits fine tuning from -4% to +5%
- AC failure Form C contact (120/240V AC)
- AC circuit breaker (30A, double pole) provides overcurrent protection and manual disconnect
- AC power ON indicator light
- 10' wiring harness for easy connection of PT Series Charger
- Compatible with: PT-14W, PT-25W, PT-40U, PT-80, PT-24-8W, PT-24-13W, PT-24-20U, PT-24-45U, PT-24-95U, and PTMS-24-67

Options

- Remote relay for Hi/Low voltage alarms (model DIR)
- Wires harness to length

Model	Size H x W x D	Weight
PT-MCU	8.7" x 4.6" x 5.5"	5.5 Lbs.



ABC Series Battery Chargers

The ABC-25 charger utilizes 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. These chargers are ideal for vessels which have an intermittent demand for battery power.

Features

- Total output ammeter
- Dual independently regulated output banks
- On-off switch and power "on" indicator light
- Vibration absorbing mounting grommets
- Powder coat aluminum case
- 115/230 VAC input
- Auto-reset thermal overload protection
- Conformal coated circuit board
- Convection cooled case, no fans. Ideal for high moisture environments



ABC-12-25

Model	Input	Amps @ F. L.		Output		Dimensions (H x W x D)	Weight
		Volts	Banks	Amps	Amps		
ABC 12-25	105-125 VAC or 210-250 VAC, 50-60Hz	5/2.5	12	2	25	11.9" x 4.7" x 6.2"	14 Lbs.



DC Power Onboard

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. 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 allow for easy system monitoring and control.

Features

- 1000, 1500, 2000W models
- Pure sine wave 115V output
- High efficiency ~ 90%
- Power saving mode conserves battery when not in use, user adjustable set points
- AC duplex outlet on front panel
- Status indicator lights on front panel:
 - Input voltage
 - Output power level
 - Power mode
 - Fault status
- Remote control/display included
- Protection:
 - Low input voltage
 - Overload
 - Short circuit
 - Over temp
- Meets UL458
- Rugged and compact aluminum case, ideal for marine applications



1000 Watt

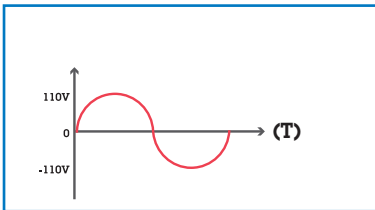


Remote Panel Included



2000 Watt

True Sine Wave



Pure Sine Wave output for interference free operation of electronics.



Power entertainment systems without running generator.



Make a pot of coffee when AC power is not available.

Description	Input	AC Output		Dimensions			Weight (Lbs.)
		Continuous	Surge	H	W	D	
12-1000 PS	12V	1000W	2000W	3.46"	7.17"	15.1"	8.8
12-1500 PS	12V	1500W	3000W	3.46"	7.52"	16.34"	10.5
12-2000 PS	12V	2000W	4000W	6.53"	8.22"	14.5"	12.2
24-1000 PS	24V	1000W	2000W	3.46"	7.17"	15.1"	8.8

Inverter-Chargers - Torque Series

TQ Inverter-Chargers deliver pure, sinusoidal AC for flawless operation of all appliances and sensitive electronics. These units are ideal for entertainment systems, and computers and other microprocessor based equipment which are intolerant to AC wave distortion. They provide peak power for motor starting, and high continuous duty ratings.

Whenever shore or generator AC power is available, a built-in automatic transfer switch activates the multi-stage, temperature compensated battery charger providing rapid and safe replenishment of the inverter battery bank. AC input current limit in charging mode can be programmed to match available shore power, thus preventing tripping the dock breaker.

A front panel Diagnostic monitor panel provides system status, and an optional LCD remote display is available.



Features

- Pure sine wave provides distortion free AC output
- Built-in high output, 3 stage charger for rapid battery bank replenishment - programmable for gel-cell, flooded lead-acid or AGM battery type with automatic temperature compensation sensor
- Programmable AC input power limiting avoids nuisance tripping of shore power breakers when limited power is available
- Rugged heavy duty case and power components
- UL listed
- Optional: Remote LCD Monitor & Control Panel
Model: **TQ-DSP-12/24**



Military tugs utilize inverters as AC UPS as back-up to on-board generators.



5.75" x 3.75"



Programmable AC input power limit avoids shore power breaker trip in charge mode.

Model	1000TQ-12	1500TQ-12	2000TQ-12	3000TQ-12	2400TQ-24	3600TQ-24
Inverter Sine Wave Output:						
Watts (Surge)	1,500	2,500	4,500	5,500	5,000	8,000
Watts (Continuous)	1,000	1,500	2,000	3,000	2,400	3,600
Inverter Input:						
VDC	10.5 - 17	10.5 - 17	10.5 - 17	10.5 - 17	21 - 30	21 - 30
Max. Amps	104	147	204	315	250	400
Charger Input: 95 - 135V AC, 60 Hz.						
Max. Amps	8	12	16	22	20	23
Charger Output:						
Max Amps @ V	60A@12V	75A@12V	125A@12V	150A@12V	75A@24V	90A@24V
Case (H x W x H) inches:						
Case Size Ref.	12 x 14 x 6	12 x 14 x 6	14 x 14 x 6	15 x 16 x 8	12 x 15 x 6	14 x 17 x 8
Weight (Lbs.)	40	40	40	68	40	68



DC Power Onboard

DC UPS

Electronics require a clean and reliable source of DC power for proper operation, they are highly vulnerable to shut down / reboot / data corruption caused by power drop out during engine start and low voltage from over worked batteries. RF Interference generated by alternators and motors also impedes proper operation.

A DC UPS is the remedy to these issues

Below are several choices of DC UPS solutions, depending on the type, duration, severity of power issue encountered, and level of protection desired.

Protection During Engine Start

StartGuard

This unit has an internal battery that supplies supplemental power to electronics during the engine cranking cycle when there is an abrupt voltage drop caused by the high amperage draw of the starter motor. A sense wire connected to the start switch brings the battery online whenever the engine is cranked. This prevents reboot, memory dump, and loss of data in GPS, sounders, and radios.



Model	Input	Output	Size (H x W x D)	Weight	Back-Up
NS-12-20	12V	12V, 20A	8.25" x 4.9" x 3.5"	5.5 Lbs.	20 Amps for 1 min.

Continuous Protection

The Nav-Pac and MDP contain an internal battery that supports electronics when primary input power falters or altogether fails.

Nav-Pac®

- Internal 5AH battery
- Recharges directly from primary voltage source
- Filters electronic interference
- Absorbs line voltage spikes
- Available in 12 volt, 20 amp and 24 volt, 15 amp models



Mobile Data Power

- Internal 7AH battery
- Internal 3 stage charger maintains battery in peak condition
- Filters electronic interference absorbs line voltage spikes
- Low voltage output signal interfaces with Motorola work stations and video recorders initiating orderly shutdown.
- Programmable timer disconnects load from battery at specified time after ignition shut off
- 25 amp load rating



Model	Input	Output	Size (H x W x D)	Weight
NP-12	12V	12V, 20A	5.25" x 6.2" x 7.5"	6 Lbs.
NP-24	24V	24V, 15A	6" x 6.75" x 7.5"	8 Lbs.

Battery Back-Up	
12V	24V
8A for 15 min.	8A for 15 min.
12A for 8 min.	12A for 8 min.
18A for 2 min.	15A for 2 min.
20A for 1 min.	-----

Model	Input	Output	Size (H x W x D)	Weight
MDP-25.0	12V	12V, 25A	5.75" x 6" x 8.5"	10

Battery BackUp
25 amps for 8 min.
10 amps for 20 min.
5 amps for 60 min.

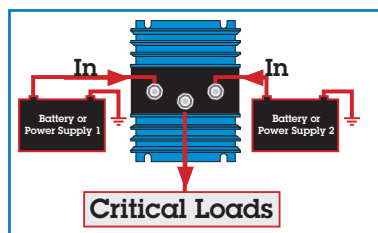
Redundant Power Source Integration

Automatic Power Selector (APS)

The APS enables integration of a redundant power source to critical electronic loads.

It automatically selects the higher voltage of two independent DC power sources and routes that source to the load. Should one source falter or fail, the other will automatically supply the load with no transfer delay, thus operation continues uninterrupted.

Typical Installation



Model	Max Loads	Size	Weight
APS-70	70 Amps	3.25" x 4.5" x 3.1"	2 Lbs.
APS-160	160 Amps	9.0" x 4.5" x 3.1"	5 Lbs.



DC Power Onboard

DC UPS

Integrated Power System

The Integrated Power System (IPS) is a unique multifunction power supply which incorporates built-in battery back-up and numerous power accessories within a rackmount chassis.

The internal batteries are always in-line with the load, thus there is no interruption 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.



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. Input terminals provided for integrating additional external batteries for increased back-up capacity (except IPS-12-40)
- 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
- 19" or 23" rack mount, flush or 6" forward mounting
- Input 115/230V AC, 50-60 Hz.



Integrated Power System provides primary and back-up power to critical navigation and safety systems.

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

Size and Weight (All Models): 3.5" H x 17" W x 18" D, 33 Lbs. (with batteries)

Power-Pac

The 12 volt supply features built-in back-up batteries which are charged during normal operation and then continue to power radios when AC power is lost.

- Power Supply Output: 13.6V, 10 amps intermittent, 5 amps continuous
- Low battery alarm and disconnect
- Aux. input terminals for integrating additional external batteries for increased back-up capacity
- 115/230V AC input



Run Time on Internal Battery

Models	Battery	Size (H x W x D)	Weight
PP-7	7 AH	5.3" x 9.0" x 10.5"	18 Lbs.
PP-14	14 AH	5.3" x 9.0" x 10.5"	24 Lbs.

7 A/H Battery Installed	14 A/H Battery Installed
7 amps for 40 min.	7 amps for 100 min.
10 amps for 20 min.	10 amps for 60 min.



DC Power Onboard

DC Converter - Standard & Isolated Series

Standard Series

Convert 20-50 VDC input to 12 or 24 VDC negative ground output for powering communication/navigation equipment, on negative ground systems. Ideal for powering voice, data and navigation electronics in marine applications.

Features

- Excellent Regulation: Output voltage maintained within 1% under all line and load conditions
- 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
- Conformal coating on PC boards and corrosion-resistant powder coated aluminum case with heavy duty shock mounts assure survival in hostile environments
- Current limiting
- Automatic thermal shutdown
- Short circuit proof
- Reverse polarity and overvoltage protection

Options

- Operation as a battery charger or parallel redundant operation (contact factory)
- 24V output



Standard Model	Input Voltage	Output Voltage	Inter.	Cont.	Size (H x W x D)	Weight (Lbs.)
24-12-3	17 - 32	13.6	3A	3A	4" x 4" x 2"	1
32-12-6	20 - 50	13.6	6A	6A	3" x 5" x 11"	3
32-12-10	20 - 50	13.6	10A	10A	5" x 6" x 11"	5
32-12-15	20 - 50	13.6	15A	15A	5" x 6" x 11"	5
32-12-25	20 - 50	13.6	25A	20A	6" x 5" x 14"	8
32-12-35	20 - 50	13.6	35A	30A	6" x 5" x 16"	12
32-12-50	20 - 50	13.6	50A	40A	7" x 7" x 19"	16

Isolated Series

The Isolated Series provides voltage from conversion as well as input/output isolation, allowing use of negative ground gear with positive or floating ground battery systems, or vice versa. May also be used as 12 or 24 volt stabilizers for electronics that are highly sensitive to input voltage fluctuation.

Using an Isolated Converter as a voltage stabilizer on 12 or 24 volt systems can solve conducted noise and interference problems on sensitive DC powered devices for communication, navigation systems and DC micro-processor based electronics.

Features

- Wide range of input voltage
- Precise output voltage regulation
- Reverse polarity protection
- 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
- Rugged case designed for high vibration applications

Options

- Operation as a battery charger or parallel/redundant operation (contact factory)
- 24 VDC output (contact factory)



Isolated converters in parallel/redundant configuration deliver noise-free and regulated voltage to propulsion system controllers.

Isolated Model	Input Voltage	Output Voltage	Output Amps Inter.	Cont.	Size (H x W x D)	Weight (Lbs.)
12-12-12I	10 - 16	13.6	12	8	5" x 6" x 14"	6
12-12-35I	10 - 16	13.6	35	20	6" x 7" x 17"	12
48-12-6I*	20 - 56	13.6	6	6	5" x 6" x 8"	7
48-12-18I*	20 - 56	13.6	18	10	5" x 6" x 14"	8
48-12-35I*	20 - 56	13.6	35	20	6" x 7" x 17"	12

* Available in 24V output, contact factory



DC Power Onboard

Step-Up Converters & DC Power Stabilizers

DC Converters - Step-Up Series

These "UP" converters produce 24 volts from 12 volt systems and are ideal for managing dual voltage applications without having to install a 24 volt battery and dedicated charging system. Choose from two types depending on your application. Standard, non-isolated where input and output share common ground reference, and isolated where input and output are galvanically separated.

Standard, Non-Isolated Series

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

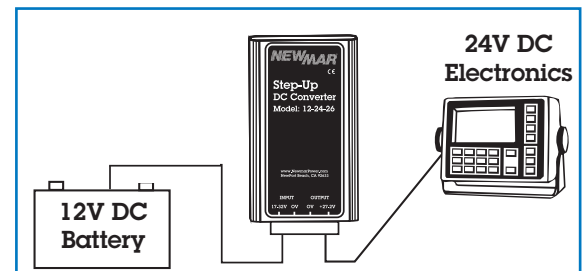
Isolated Series

- Allows positive/negative ground compatibility between 12V battery and 24V accessories
- Input/output isolation 250V DC



12-24-16
Step-Up DC Converter

Typical Standard Application



Step-Up Converters

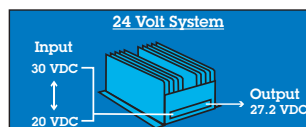
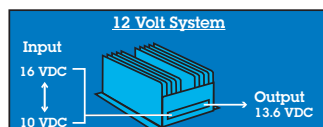
Model	Input Voltage	Output Voltage	Output Amps	Size (H x W x D)	Weight (Lbs.)
Standard - Non-Isolated					
12-24-7	10 - 15	27.2	7	4" x 4" x 2"	1.4
12-24-16	10 - 15	27.2	16	8" x 13" x 24"	3.35
12-24-25	10 - 15	27.2	25	6" x 7" x 17"	4.1
Isolated					
12-24-6I	10 - 16	24.5	6	5" x 6" x 14"	6
12-24-18I	10 - 16	24.5	18	6" x 7" x 17"	12

DC Power Stabilizers

Feed sensitive electronics with clean and proper voltage regardless of battery condition. These stabilizing converters provide continuous, precisely regulated output free of conducted noise over the entire range of a battery's usable voltage, thus eliminating fluctuating input voltage and noise which can cause shutdown, diminish performance and possibly damage sensitive circuitry.



12-12-35I
Stabilizing DC Converter



DC Power Stabilizers

Model	Input Voltage	Output Voltage	Output Amps	Size (H x W x D)	Weight (Lbs.)
Isolated					
12-12-3I	10 - 16	13.6	3	4" x 4" x 2"	1
12-12-6I	10 - 16	13.6	6	4" x 4" x 2"	1
12-12-12I	10 - 16	13.6	12	5" x 6" x 14"	6
12-12-35I	10 - 16	13.6	35	6" x 7" x 17"	12
24-24-3I	20 - 32	27.2	3	6" x 7" x 17"	12
24-24-7I	20 - 32	27.2	7	7" x 4" x 2"	2
48-24-9I	20 - 56	24.5	9	5" x 6" x 14"	8
48-24-18I	20 - 56	24.5	18	6" x 7" x 17"	12



DC Power Onboard

Heavy Duty Power Supplies

These super-rugged DC power supplies are ideal for powering 12 and 24 volt communication/navigation equipment onboard commercial vessels 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. Provides solid power source for electronics
- 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
- 115/230V AC, 50 - 60Hz. input

Options

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



Commercial Vessels of all types utilize these heavy duty power supplies to assure reliable operation of communications and navigation electronics

Model	Output			Dimensions (H x W x D)			Weight Lbs.
	Voltage	Amps Inter.*	Amps Cont.	Inches			
115-12-8	13.6V DC	8	5	6.0	4.6	8.5	10
115-12-20A	13.6V DC	20	8	5.7	4.8	16.3	20
115-12-35CD	13.6V DC	35	35	6.5	9.5	14.0	32
24 Volt							
115-24-10	24.5V DC	10	4	5.7	4.8	16.3	20
115-24-18CD	24.5V DC	18	18	6.5	9.5	14.0	32
115-24-35CD	24.5V DC	35	35	6.5	13.0	18.75	60

* Intermittent: 20 minutes max on time, 20% duty, Continuous: 24 Hours/Day 100% Duty



DC Power Onboard

DC Power Onboard Solutions



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