

HEAVY DUTY, ISOLATED, SPIKE-PROTECTED DC-DC CONVERTERS

OPERATION AND INSTALLATION INSTRUCTIONS

NEWMAR®
ELECTRONIC POWER PRODUCTS
COMMUNICATION • NAVIGATION

Your NEWMAR Power Converter is the product of a company with 30 years experience in the design and manufacture of power supplies for marine and land based communication and navigation applications.

Constructing power supplies that will survive hostile environments requires special electrical components and engineering techniques that NEWMAR has developed through years of field testing and evaluation. The result is a line of converters that is built to survive vibration, heat, humidity, dust, high power demands, and other hostile conditions encountered aboard work boats, offshore platforms, on heavy equipment used in mining, logging and construction and on material handling equipment and locomotives.

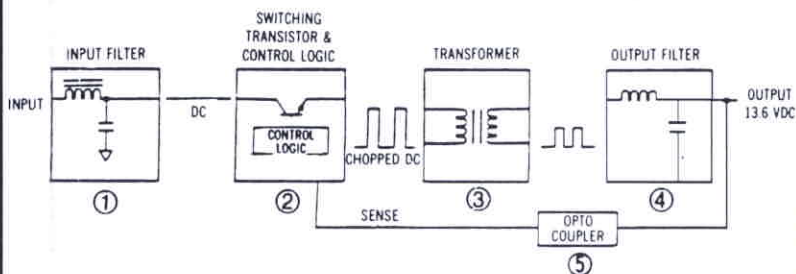
We're confident your NEWMAR Converter will serve you well. Please read the installation instructions and recommendations on the back of this page to assure proper operation of your converter.

FEATURES

- Special spike suppression circuit protects converter and equipment being powered against voltage line transients which are typically encountered on railcars, forklifts and other electric vehicles.
- Fully isolated input and output allows use of positive or negative ground equipment on vehicles with positive, negative or floating ground battery systems.
- Critical line regulation design maintains DC output voltage within 2% regardless of varying DC input voltages or changing load conditions.
- Automatic thermal overload protection prevents internal damage from high temperatures due to ambient conditions and/or overloads.
- Low output ripple eliminates electronic noise and interference.
- Maintenance free solid state circuitry assures years of dependable service.
- Conformal coated printed circuit board resists corrosion.
- Rugged, rust and corrosion proof case of anodized aluminum with integral oversized heat sink provides convection cooling of components.
- Integral shock mounts reduce component vibration.
- All components selected for dependable performance in the most hostile environments.
- Each unit thoroughly tested and inspected before shipment.
- Two year limited warranty.

THEORY OF OPERATION

HIGHLY REGULATED, LOW RIPPLE, ISOLATED
SPIKE-PROTECTED DC CONVERTER



1. SUPPRESS INPUT VOLTAGE TRANSIENTS AND FILTER INPUT FROM REFLECTED SWITCHING
2. REGULATE BY VARYING "ON" TIME
3. STEP DOWN AND ISOLATE
4. FILTER TO PURE DC
5. SENSE AND ISOLATE

ISP SERIES - HEAVY DUTY DC CONVERTERS

MODEL	INPUT	13.6VDC OUTPUT	DIMENSIONS H W D	WEIGHT (LBS)(KG)
36-12-6 ISP	18-65 VDC Pos. or Neg. Ground	6 amps Continuous	4.25"x5.9"x7.7" 10.8X15X19.6 (cm)	5 lbs. 2.27 kg
36-12-18 ISP	20-65 VDC Pos. or Neg. Ground	18 amps Intermittent 10 amps Continuous	6"x4.6"x13.7" 15.2X11.7X34.8 (cm)	8 lbs. 3.65 kg
72-12-6 ISP	42-90 VDC Pos. or Neg. Ground	6 amps Continuous	4.25"x5.9"x7.7" 10.8X15X19.6 (cm)	5 lbs. 2.27 kg
72-12-18 ISP	42-90 VDC Pos. or Neg. Ground	18 amps Intermittent 10 amps Continuous	6"x4.6"x13.7" 15.2X11.7X34.8 (cm)	8 lbs. 3.65 kg
110-12-6 ISP	80-140 VDC Pos. or Neg. Ground	6 amps Continuous	4.25"x5.9"x7.7" 10.8X15X19.6 (cm)	5 lbs. 2.27 kg
110-12-18 ISP	80-140 VDC Pos. or Neg. Ground	18 amps Intermittent 10 amps Continuous	6"x4.6"x13.7" 15.2X11.7X34.8 (cm)	8 lbs. 3.65 kg

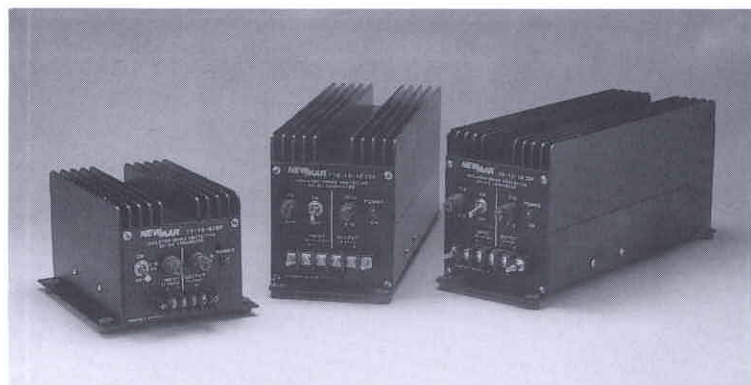
NOTE: 24 volt output models and 35 amp models available as special order items.
Contact factory for specifications.

Amperage Ratings @ -40° to +80° C. See Graph for Derating Curves.

Intermittent = 20 min. on 20% duty cycle

Continuous - 24 Hr. / Day, 100% Duty

Note: Current limit set at 105% of intermittent rating.



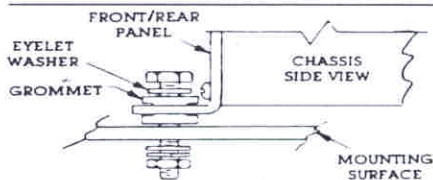
INSTALLATION

Select a suitable location for installation. The converter should be mounted where there will be a free flow of air around the unit. It should not be located near water or oil pumps, near exhaust manifolds or where the converter is likely to come into contact with battery gasses. Vertical mounting is preferred for cooler operation, but horizontal mounting is acceptable when this is impractical. Use the rubber shock-absorbing grommets provided to assure a secure installation and to protect the internal components from vibration.

IMPORTANT: Although the converter is constructed of materials and in a manner which makes it highly resistive to the corrosive effects of moisture in the environment, it is not waterproof. Do not mount the converter where there is a possibility of water entering the unit. Evidence of water entry into the converter will void the warranty.

HOW TO INSTALL GROMMETS FOR ISOLATION AND SHOCK MOUNTING

NOTE: To ease installation of grommets, spray with WD-40 or similar lubricant.



NOTE: Heavy duty mounting kit is available for extreme vibration environments - contact factory.

It is recommended that the converter be mounted as close to the load as possible to reduce the effect of line loss. See WIRE SIZE TABLE for recommended gauge.

INPUT/OUTPUT WIRING

The input terminals are designated on the terminal block located on the front panel. Remove terminal block cover and verify correct polarity of input wires before attaching. Ring terminals are provided for both input and output wiring.

Verify correct polarity to the equipment being powered and attach your output leads. Replace terminal block cover to prevent accidental shorting of the terminals in the future.

WIRE SIZE TABLE

The following table may be used to select the proper gauge wire for both input and output connections - whether you have the 6 or 18 amp model and the length of the run from the converter to the load.

Model	Wire Length	
	10'	20'
6 amp	#14awg (2.5 mm)	#12awg (4 mm)
18 amp	#12awg (4 mm)	#10awg (6mm)

OPERATION/TROUBLE SHOOTING

Your ISP Converter has been designed to operate with an input range of 20-56 VDC, 42-90 VDC or 80-140 VDC depending on model. (See reverse for input specifications.) No adjustments are necessary to accommodate various input voltages provided those voltages fall within the unit's specified range. The converter may be safely used to power 12 volt radios and other equipment regardless of whether the vehicle uses a positive, negative or floating ground battery system.

When the converter is switched to the "ON" position the indicator light on the front panel will illuminate to signal that DC power is available at the output terminals. If this light does not come on check both the input and output fuses. Replace if necessary with a fuse of the same value. You will find the correct fuse rating designated beside the fuseholder on the front panel. Note: The symbol "F/B" beside the fuseholder indicates that replacement fuses must always be fast-blow or regular fuses. Do not replace with slow-blow fuses.

To protect the converter against the destructive voltage line spikes typically encountered on railroad and all-electric material handling equipment, the ISP converter employs a special spike-protection circuit on the input. Because of the effectiveness of this circuit it is rare the input fuse will blow due to line spikes. However, occasional random blowing of the input fuse may be caused by extreme line spikes which exceed the surge capacity of this circuit. If you suspect this may be the case contact the factory for technical assistance.

If the input fuse blows upon application of power to the converter, an internal short is probably indicated. Return the unit to the factory or have a qualified technician perform needed repairs.

The ISP series converters incorporate an auto-

matic shut-down circuit which will activate whenever inadequate or excessive input voltage is detected. It is possible this circuit can be "nuisance tripped" when the converter is operated with battery systems that have a fluctuating voltage. If this is determined to be occurring, contact the factory for technical assistance.

To double-protect the unit against overloads and shorts, the converter is equipped with a fast-acting current limit circuit. This circuit automatically drops output voltage to protect internal components when such a condition is encountered. Current limiting is indicated by a flickering or extinguished "power on" light. Remove and check your load to verify you are not exceeding the converter's ratings.

NOTE: Some inductive loads such as DC motors require high start-up surge currents which will trigger this protection circuit. In general, it is recommended that the converter is used in applications with resistive loads.

OPTIONAL MODIFICATIONS

All ISP converters may be factory modified for 24 volt output and for use as a float charger † for lead-acid batteries. Contact the factory if you have an application requiring converter modification.

† over-current protection recommended on charging leads.

ELECTRICAL SPECIFICATIONS: TRANSIENT ENERGY CAPABILITY:

72 & 110 VDC Input
100 Joules (Watt-Seconds)
Peak Current, 12,000 Amps
(8x20 micro sec impulse duration)

36 VDC Input
140 Joules (Watt-seconds)
Peak Current, 2,000 Amps
(8x20 micro sec impulse duration)

DC ISOLATION:
1,400 VDC input-output, input-chassis,
output-chassis

REGULATION:
12% line/load

RIPPLE:
150 mV P-P

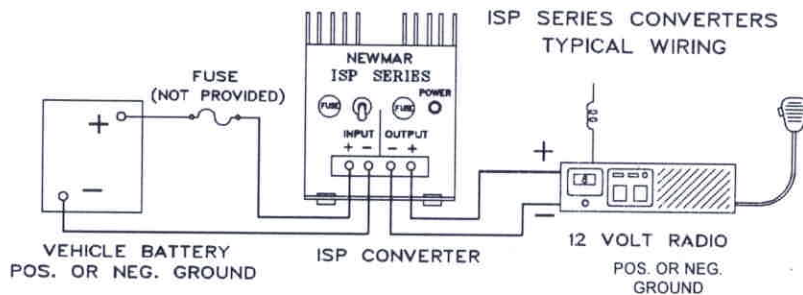
EFFICIENCY:
84% @ 50% load
82% @ 100% load

OPERATING TEMP RANGE:
-40° C to +80° C
(see derating curves)

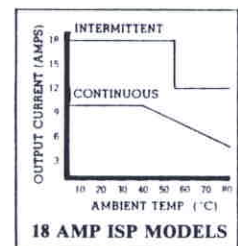
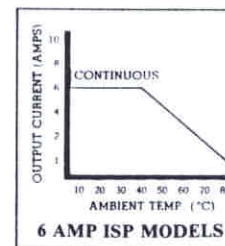
APPROVALS:

Designed to meet or exceed American Association of Railroads (AAR) specifications for communication equipment

ISP SERIES CONVERTERS TYPICAL WIRING



DERATING CURVES



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