MULTI-TYPE BATTERY CHARGER SYSTEM

★ TYPE BCP-36-1200 ★

NAVAL INTEGRATED SYSTEMS, INC., is proud to introduce its' 21st century *"Type BCP-36-1200 Battery Charger System."* The system is designed to meet and exceed the military requirement DOD-C-24529, featuring the approved* addition of Pulse Mode charging that safely and completely charges the battery system in three to four hours instead of the nominal 8 hour charge.

In addition, an optional 1200 Ampere output for aircraft engine starts (turbine spooling or reciprocal engine), is also available.

*NASA approved, NAVSEA pending amendment

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BACKGROUND:

Typically, systems utilizing older technology have found that the useful surface area of the battery plates become reduced due to sulfide buildup. The result of this sulfide-plating effect directly reduces the battery's amp/hour rating, life expectancy and efficiency, to as much as 50% less than batteries that have not been subject to plating. To overcome these deficiencies, the U.S. government and NASA have utilized pulse charging (also known as "reflex charging") in order to extend the life of many types of batteries, particularly lead-acid types.

INTELLIGENT SYSTEM OPERATION:

By incorporating pulse charge technology, the Type BCP-36-1200 operates by inducing a large current, followed by a 'rest' period that includes a depolarizing pulse of a negative charge, for a very short duration. This process reduces the chemical reaction of sulfur build-up on the plate surfaces, thereby increasing the charge absorbing ability of the battery. In addition, the depolarizing pulse decreases the gas build-up around the plates, increasing current capacity. Simultaneously, the system electronically interrogates the battery's electrical charge characteristics for any internal leaks or shorts. If damage is detected, the operator is alerted via a visual indicator lamp on the front panel.

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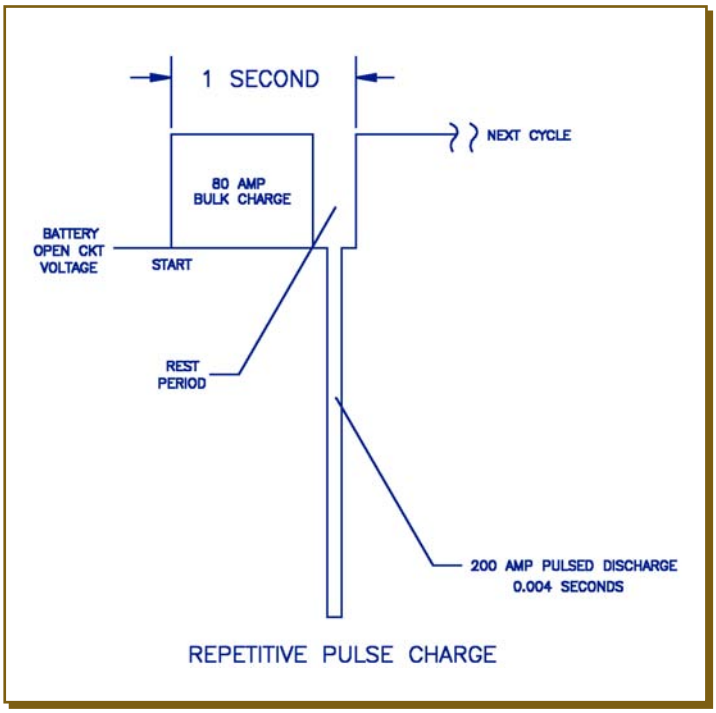
A Word About Battery Physics & Pulse Charging

A typical lead acid battery utilizes the elements Lead and Sulfur in the form of H_2SO_4, sulfuric acid. When accelerated by overcharging, a chemical reaction causes the formation of sulfides and sulfate, which coats the surface area of the battery plates. Reduction of the plate area also, (a) reduces the charge intake capacity, (b) results in degassing of the electrolyte, and (c) creates heat buildup.

Battery manufacturers recommend a constant charge rate of one-tenth the Ah (Amp hour) rating of the battery. A 100Ah rated battery can be charged safely at 10 Amperes in approximately 10 hours. The sulfide buildup/barrier occurs over this typical charge rate. The sulfide barrier buildup can be overcome by applying short intervals of high "negative" or "discharge" current pulses between charge cycles, e.g., the "pulse charging technique."

This technique will reverse the chemical reaction of the buildup, by returning the sulfide back to sulfuric acid, allowing 90% of the charge to remain in the battery. For example, a battery can be charged to 80% of its Ah rating, i.e., 80 amps of charge current being pulsed into the battery every second with a 20 millisecond rest and a negative pulse cycle of 200 amperes for 4 milliseconds. This technique results in batteries being charged 5 times faster with reduced degassing and life prolonging, de-sulfating.



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Recent Advances in Battery Charging

With the recent advances of Power MOSFET technology, coupled with its "intelligent" detection circuitry, the BCP-36-1200 is the most reliable, lightweight and economical unit available today.

These benefits are achieved, in part, by utilizing highly reliable, state-of-the-art circuit components, in order to obtain an extremely "low ON" resistance, in the order of a few thousandths of an ohm. This relates into very low power loss. For example, the latest MOSFET transistors can efficiently switch 1000 watts of power, with a rating between 97% and 99.8%.

Also, by incorporating "high frequency ferrite transformer switching" technology, a 5 pound transformer, with a ferrite core, operating at 600 kilohertz, can perform the same power handling capacity of a 100 pound iron core transformer, operating at 60 hertz. Power vs. weight and frequency is quite evident in 400 Hz aircraft power.

Naval Integrated Systems has developed a lighter-weight and more portable battery charger system using these technologies. This system replaces older, 60% efficient units, weighing several hundred pounds more. Given the typical power efficiency of the new charger system, the customer can realize power savings of greater than 35%.

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FEATURES:

- Drip Proof Enclosure, w/Modular Power Blocks
- Fully Automatic Charging, Temperature Compensated
- 50% Faster Charge Rate (in Pulse Mode)
- Easy-Read Status Indicator Lights
- Integral Digital Coulometer
- Short Circuit & Reverse Polarity Protection
- Built-In Battery Reconditioning/Desulfate (in Pulse Mode)
- Three Stage Automatic Rapid Charging
- Lightweight & High Efficiency
- Under Voltage / Charging Complete Indicators
- High Frequency Power Converter
- Spike Voltage Protection
- Compatible with Flooded cell, Gel cell and Absorption Glass Mat (AGM) batteries

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SPECIFICATIONS:

REFERENCE	DESCRIPTION	REMARKS
INPUT	Supply Voltage	440 VAC 3 phase Delta, 50-60 Hz
	Supply Voltage	42 Kilowatts (full load engine start)
OUTPUT	Type I	130A ±2% (12 V Nom.)
	Type II	150A ±2% (24 V Nom.)
	Type III	180A ±2% (36 V Nom.)
	Type IV	200A ±2% (24 or 36 V Nom.)
	Pulse Charge (12/24/36V)	250A (MIN) / 650A (MAX)
	Discharge (4m sec.)	1625A (NOM)
(optional)	Engine Start (10 sec.)	30 VDC @ 1200A
(optional)	Engine Start (5 min.)	32 VDC @ 800A
GENERAL	Charging Efficiency	>95%
	Operating Temperature	0-50 °C
	Humidity	100%
	EMI	MIL-STD-461, class 2A, CEO1
	Shock	MIL-S-901, grade A, class 1
	Vibration	MIL-STD-167-1, 0-33 Hz
	Inclination	0-45° from vertical, any direction
	Cooling	Natural Draft
	Over-Temp Protection	2-Level Thermostat Shutdown
	Dimensions	37" T x 24" W x 26" D (exc. eyebolts)
	Weight	<400 lbs.

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