APCL-5 FLASHCHANGER®
Integrated Flasher/Lampchanger Unit

Pharos Marine Automatic Power

Automatic Power's newly-developed microprocessor-based unit packs a wide array of capabilities into one compact, lightweight and highly reliable package. Occupying the space of a typical lampchanger, this unit can be placed in virtually every optic of 140mm diameter or larger. It frees up the space in the base of most lanterns (normally occupied by a typical flasher) for housing power supplies, batteries, time dependent operation boards, battery chargers, monitoring or control electronics, radios, etc.

UNMATCHED VERSATILITY

The APCL-5 provides a wide array of advanced capabilities:

- Field selection of a combination of flash rhythms, voltage regulation points, and/or communications addresses.
- Pulse-width modulated voltage regulation system.
- Photocell Daylight Control.
- Serial Communications Interface (SCI).
- Synchronization Terminal and Lampout Flag and Secondary Optic Control Terminal.
- Solar Charge Regulation and Blocking Diode.
- Electrical and Optical Monitoring of Lamp.
- Manual Switch or Radio Actuated Field Self-Test Routine.

STATE-OF-THE-ART VOLTAGE REGULATION

The heart of the APCL-5 is a microprocessor which controls the pulse width modulated voltage regulation system. This system relies on switched field effect transistors (FET) to chop the direct current input voltage into a square wave pulse train. This system has two outstanding benefits:

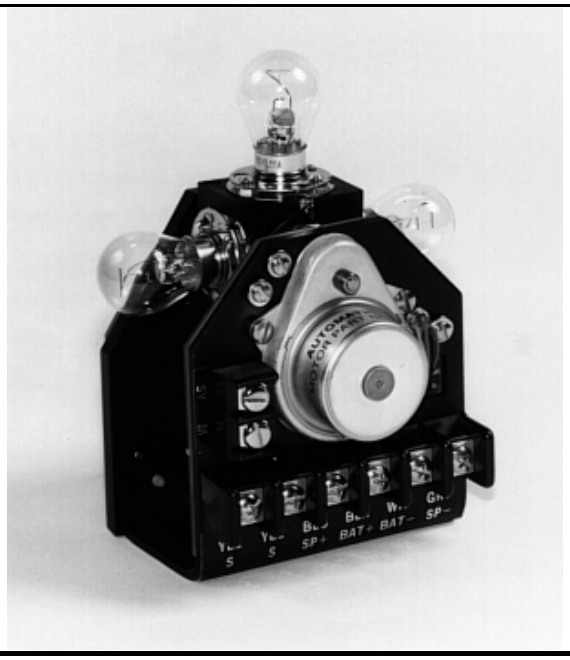
a. The life of incandescent signal lamps is, typically, doubled due to reduced DC notching of the filaments.

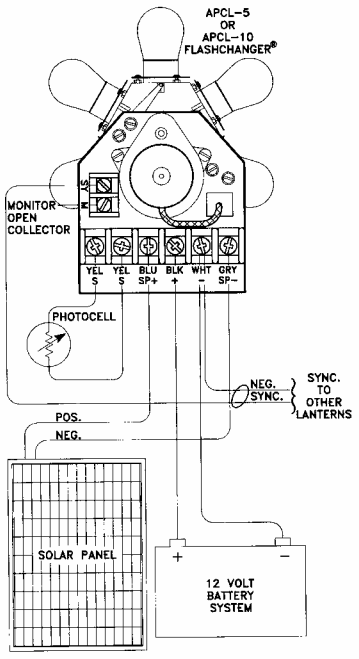
b. Regulation losses are less than 3% regardless of the input/output voltage ratio. For example, 12-Volt lamps are efficiently powered from a 24-Volt solar power system while maintaining the same 12V or 24V battery bank capacity in watt hours and the same 12V or 24V wattage of solar arrays. Power cable sizes may be adjusted accordingly.

SUPERIOR ENVIRONMENTAL PROTECTION

The APCL-5 features several new environmental protection enhancements including gold contacts coated with corrosion inhibitor, double painted circuit boards, auxiliary motor cover, and shafts coated with high temperature lithium grease. Unit operates over the temperature range of -40EC to +70EC, with 0-100% relative humidity. Unit operates normally after immersion in a four-day high-temperature salt fog test!

Heirs to the original 1928 patent for lampchangers and the pioneer in the electrification of aids to navigation, Automatic Power, Inc. manufactures to the quality and reliability standards demanded by the marine environment. Staff design engineers are able to adjust APCL-5 specifications to specific customer needs.





TYPICAL INTERCONNECTION DIAGRAM

SPECIFICATIONS

- **Input Voltage:** 5-30 Volts DC.
- **Output Voltage**: Pulse Width Modulated Regulated for voltages 0.2 volts above regulation point. 2% accuracy. Unregulated Output tracking minus 0.20 volts below input for input voltage less than 0.2 volts above regulation point.
- **Output Current:** 6 Amps maximum.
- **Solar Charge Regulator:** 10 amp solar charge regulator prevents battery overcharge. Blocking diode also provided.
- **Lampchanging :** Four-place or Six-place unit with microprocessor-controlled stepper motor, accurate to fractions of millimeters, provides virtually shock-free lamp replacement. If all lamps have failed, automatic lamp recheck and autorotation limit after each photocell transition.
- **Power Consumption:** 5 milliamps flash or idle - day and/or night.
- **Reverse Polarity Protected:** Lamp burns fixed as indicator.
- **Daylight Control:** Resistance set at: 1700 ohms - switch on; 1200 ohms - switch off. Adjustable.
- **Flash Rhythms:** Multiple flash rhythms, factory programmed to customer requirements and field selectable by means of hex switches. Unit may be programmed to change flash rhythm based on number of lamps remaining or low input voltage.
- **Serviceability:** Large, screw-type, nickel-alloy plated, brass terminals for solar panel, battery, photocell, synchronization, and control/alarm/monitor output.
- **Environmental:** Operating temperature -40E C to 85EC. Relative Humidity 0-100 percent. High Temperature Salt Fog. Gold plated contacts. Anodized frame. Auxiliary motor cover. Total corrosion treatment.
- **Monitoring via Serial Communication Interface (optional):** System Voltage, Number of Operable Lamps, Photocell Status, Flash Rhythm, Flash Failure (Optically Verified), Flash Code Switch Setting.

- **Control via Serial Communication Interface (optional):** Remote On/Off, Flash Rhythm, Recount of the Number of Operable Lamps Remaining, Flash Synchronization, Vary Lamp Voltage.
- **Communications (optional):** RS232/RS-485 interface. Individual Communications Addresses of FLASHCHANGERS® may be set or changed via hexadecimal switch settings. Interface useful for operational check, via hardwire or radio, of the number of good lamps, etc. for lanterns mounted in remote locations on towers, bridges, etc.
- **Synchronization:** Terminal provided to allow flashing of multiple lamps in unison via hardwire or UNIFLASH®-II wireless synchronization system. Sync output backward compatible with API products to 1982. Sync compatible with selected products from other manufacturers.
- **Low Voltage Disconnect (optional):** Unit may be programmed with a low voltage disconnect to prevent complete discharge of the battery. Customer may specify disconnect and reconnect voltage.
- **Self Test Feature:** Depressing test button on side of unit or closing contact by radio control initiates self test routine which starts by burning operating lamp fixed for predetermined period to assist in voltage measurements. Fixed burn is followed by the FLASHCHANGER® rotating to each lamp position and flashing in sequence the number of good lamps it has encountered to that point. e.g. one flash, two flashes, etc. as each good lamp is encountered. After all lamps have been sampled, the unit returns to normal operations. A limit of three self test routines are allowed each day. Specialized self test routines may be programmed.
- **Alarm/Secondary Optic Control:** Terminal provided that posts an open collector monitor/alarm/control for a secondary optic when all lamps have failed on the primary FLASHCHANGER®, or, as an option, when the last good lamp is in the operating position.
- **Date Dependent Operation (optional):** Unit may be fitted with an optional board located in a flasher can to provide on/off control of the light based on preprogrammed dates. Unit is programmed via an RS-232 interface by an IBM compatible computer with API windows based software. Unit retains programming though power interruptions.

www.automaticpower.com

Pharos Marine – England
Steyning Way, Houndslow
Middlesex, England TW4 6DL
Phone: 44-20-8538-1100
Fax: 44-20-8577-4170
sales@pharosmarine.com

AUTOMATIC POWER – HOUSTON
MAIN OFFICE & FACTORY
213 Hutcheson St.
Houston, TX USA 77003
P.O Box 230738
Phone: 713-228-5208
Fax: 713-228-3717
sales@automaticpower.com

Pharos Marine – Singapore
35 Tannery Road
05-05 Tannery Block, Singapore
347740
Phone: 65-6-747-9325
Fax: 65-6-746-0478
abpharos@singnet.com.sg

Automatic Power – West Coast USA
26 Pizarro Ave.
Novato, CA USA 94949
Phone: 415-382-6296
Fax: 415-382-6299
dolantp@aol.com

Automatic Power – Gulf Coast USA
1340 Westbank Expressway
Westwego, LA USA 70094
Phone: 504-347-2384
Fax: 504-348-2306
dcummiskey@automaticpower.com

Automatic Power – East Coast USA
204 Parkway Drive
Williamsburg, VA USA 23183
Phone: 757-253-2817
Fax: 757-220-8166
APIatlantic@aol.com