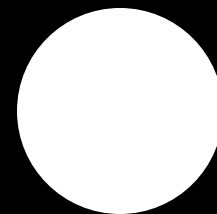


MARK 15™

Specialty Concepts, Inc.

PHOTOVOLTAIC CHARGE CONTROLLER / SYSTEM MONITOR



DESCRIPTION

The Specialty Concepts, Inc. MARK 15 is a cost effective, flush mount, battery charge controller with digital system monitoring. The MARK 15 is available for 12 or 24-volt systems with charging current up to 15 amps, and provides efficient charging while protecting the batteries from damage due to overcharging. This controller is designed for use in mobile or stationary photovoltaic energy systems, with complete system monitoring of battery voltage, solar charging current, and charge set-point calibration. Charge-mode status lights, battery condition LED bar-graph, a blocking diode, battery fuse and array fuse are standard.

FEATURES

CHARGE REGULATION

- 15 amp charge current, 12 or 24 volt Easily handles over-currents
- Switching shunt, LFCS pulse charging method
- Field adjustable set-points

DESIGN FEATURES

- 100% solid-state
- Designed for rugged mobile use
- Over-current protection - battery fuse, array fuse
- Reverse leakage protection - blocking diode
- Reverse polarity protection
- Lightning protection
- Input noise suppression
- Low power consumption
- 12 awg terminal block

MONITORING

- Digital monitoring of:
 - a) System battery voltage
 - b) Solar charge current
 - c) Charge set-point calibration
- "SOLAR CHARGING" light
- "BATTERY CHARGED" light
- LED bar-graph BATTERY CONDITION indicator
- BAR or DOT display
- Power saver display mode

MOUNTING

- Flush mount
- Knock-out box available for wall mounting (4x7 BOX accessory)



MARK 15

OPERATION

SWITCHING SHUNT REGULATION - The

MARK 15 will allow maximum array current to flow into the battery through a blocking diode, lighting the "SOLAR CHARGING" light (LED), until the battery voltage reaches the charge termination set-point. At this point, a shunt transistor will turn on, shunting the solar array, turning off the "SOLAR CHARGING" LED, lighting the "BATTERY CHARGED" light and halting any further battery charging.

When the battery voltage drops to the charge resumption set-point, the shunt transistor will turn off and charging will resume. The result is that when battery capacity is low, charging will be continuous. As the battery charges up, current will pass into the battery for shorter and shorter periods, until at full charge, it will pulse current into the battery to achieve and maintain full charge.

OPTIONS DESCRIPTION

A - Temperature Compensation:

Temperature compensation is generally recommended for sealed batteries or where batteries are expected to experience temperature variations of more than $\pm 10^\circ$ from 25°C during periods of charging. A small temperature sensor on a 10 foot lead monitors actual battery temperature and adjusts the charging thresholds according to battery temperature. The rate of compensation is $-5\text{mV}/^\circ\text{C}$ per battery cell from 25°C .

E - Low Voltage Disconnect (LVD) / Generator Start:

The MARK 15 can be provided with an auxiliary relay. This relay can be used to protect the battery from low-voltage damage by disconnecting loads or by signaling a standby generator to start or stop battery charging. The relay is rated for 10 amps. This option provides the common, the normally open and the normally closed voltage-free contacts of the relay.

ACCESSORIES

4X7 BOX - Knock-out box used for wall mounting.

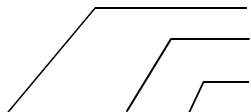
SPECIALTY CONCEPTS MARK /15

PARAMETERS	UNITS	Mark/15-12	Mark/15-24
Nominal Voltage	(Volts)	12	24
Array Voltage, Max (Voc)	(Volts)	26	52
Array Current, Continuous (Isc)	(Amps)	15	15
Array Current, Max (60 seconds)	(Amps)	20	20
Load Current, Continuous (1)(3)	(Amps)	10	10
Load Current, Max (60 seconds) (1)(3)(5)	(Amps)	13	13
Operating Voltage at Battery, Min			
Charge Control	(Volts)	0	0
Load Disconnect (LVD) (1)	(Volts)	8.5	19.0
LCD Metering	(Volts)	7.8	18.0
LED Bar-graph	(Volts)	10.5	21.0
Current Consumption			
Quiescent (Tare)	(Milliamps)	8.8	8.8
Charging (with LED Bar-graph off)	(Milliamps)	12.8	12.8
LED Bar-graph	(Milliamps per LED)	5	5
Load Disconnected (1)(4)	(Milliamps)	40	40
Charge Termination, Factory Set	(Volts)	14.4 ± .2	28.8 ± .4
Charge Termination, Adjustable Range (6)	(Volts)	13.6 – 15.3	27.2 – 30.6
Charge Resumption, Factory Set (6)	(Volts)	13.0 ± .2	26.0 ± .4
Load Disconnect (LVD), Factory Set (1)	(Volts)	11.5 ± .2	23.0 ± .4
Load Disconnect, Adjustable Range (7)	(Volts)	10.7 – 12.2	21.4 – 24.4
Load Reconnect, Factory set (1) (7)	(Volts)	13.0 ± .3	26.0 ± .6
Voltage Drop, Array to Battery @ 15 amp			
Controller, Max	(Volts)	0.5	0.5
Controller and 2 fuses, Max	(Volts)	0.8	0.8
Voltage Drop, Battery to Load, Max. (1)	(Volts)	0.06	0.06
LCD Meter Accuracy			
DC Voltage	(Volts)	0.5 %	0.5 %
DC Current	(Volts)	1 %	1 %
Temperature Comp. Coef. (from 25°C) (2)	(Volts/°C)	-.03	-.06
Operating Temperature Range	(°C)	-30 to 50	-30 to 50
Storage Temperature Range	(°C)	-40 to 70	-40 to 70

Notes:

- (1) Low-voltage load disconnect option
- (2) Temperature compensation option
- (3) Non-inductive.
- (4) LVD relay energized, typical value.
- (5) Carry only, Non-switching
- (6) The Charge Termination / Resumption span is fixed. The Resumption set-point changes as the Termination set-point is adjusted.
- (7) The Load Disconnect / Reconnect span is fixed. The Reconnect set-point changes as the Disconnect set-point is adjusted.

PART NUMBERING KEY

EXAMPLE:  Model
Nominal Voltage
Option

MARK/15 - 12 - A

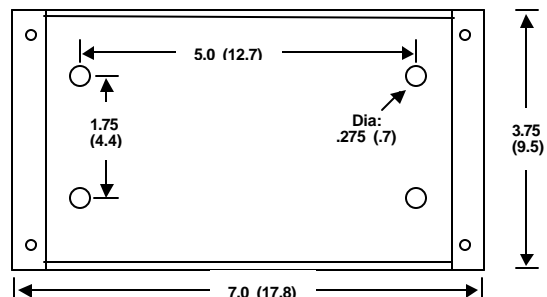
MODEL	NOMINAL VOLTAGE	OPTIONS
MARK/15	12 24	A - Temperature Compensation E - Low Voltage Disconnect (LVD)/ Generator Start

ACCESSORIES

4x7 BOX

Specifications and product availability subject to change without notice.

4x7 BOX (ACCESSORY) In Inches (cm)



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