



# C Series— C35, C40 & C60

## DC CONTROLLERS

### A Controller for Virtually Any DC Charging Source

The C40 has long been the mainstay of our charge controller line-up, its versatility and reliability have made it an industry standard. Now the C40 is joined by two companion controllers, the C35 and C60. All three of these fully solid state, microprocessor-driven controllers are UL and cUL listed. C Series controllers may be configured for PV battery charging, or DC load control or DC diversion operation. Whatever the charging source, a C Series controller is sure to meet your DC controller needs.

### Standard Features

#### Silent Microprocessor Control

All C Series controllers have a powerful microprocessor at their core which increases system performance and maximizes battery life. They are fully solid state and operate silently.

#### PWM Charge Performance

C Series controllers all use Pulse Width Modulation (PWM) charging profiles which are designed to provide a full charge to your battery while, at the same time, minimize gassing which can shorten battery life.

#### 3-Stage Battery Charging

All C Series controllers automatically initiate a 3-stage battery charging cycle. Bulk, Absorption, and Float modes are used to ensure that voltage and current settings accurately match the batteries' actual state of charge. This means fast-as-possible charging and extended battery life. An auto equalize mode can be easily switched off when the controller is used with sealed batteries. C Series controllers are factory set for solar PV battery charging operation.

#### Field Adjustable

There are a number of field configurable, user adjustments for C Series controllers. C35 and C60's can only be set for 12 or 24 VDC operation. The C40 may be configured for 12, 24 or 48 volt systems. Bulk and Float voltage set points are user adjustable which allows use with a wide variety of battery technologies including; flooded lead acid, gel, and absorbed glass mat. In addition, there are manually selectable settings for Nicad batteries.

#### DC Load Controller Mode

When used as a load controller, the C Series will automatically turn a DC load on or off at predetermined battery voltage settings. Both LVD (low voltage disconnect) and LVR (low voltage reconnect) set points are user adjustable.

#### DC Diversion Mode

In this mode, all power, which is not used to maintain a full charge on the batteries, is diverted to a "load dump" such as water or space heaters. Diversion mode is used to regulate microhydro and wind turbine systems which need a constant load.

#### LED Status Indicator

A simple to read, multi-color LED indicates operating status and is standard on all C Series controllers.

#### UL and cUL Listed

C Series controllers are listed by UL to exacting UL 1741 and cUL CSA 22.2 107.1-95 standards. C Series controllers are also CE compliant (European countries) and are designed to CTIK standards (Australia). Their current ratings are "real world" and do not have to be derated to comply with USA NEC 125% overcurrent requirements.



C Series Controller

C40/60 Model Shown

### Optional Features

#### LCD Digital Display

**CM, CMR/25, CMR/50 or CMR/100**—A back-lit meter which continuously displays: battery voltage, DC amperage, cumulative amp hours and amp hours since last reset. **CM** mounts on front of the controller. The remote meters **CMR/25, CMR/50 and CMR/100** use simple plug-in connectors. 25 ft. (7.5 m), 50 ft. (15 m) or 100 ft. (30 m) cable included.

#### Temperature Compensation

**BTS/15 or BTS/35**—Monitors battery temperature and adjusts charging voltage for maximum performance. A 15 ft. (4.5 m) or 35 ft. (11 m) cable with standard telephone type connectors is included.

# C35, C40 and C60 Controller Specifications

MODEL	C35		C40			C60	
Voltage Configurations	12 VDC	24 VDC	12 VDC	24 VDC	48 VDC	12 VDC	24 VDC
Maximum PV Array Open Circuit Voltage	55 VDC	55 VDC	125 VDC	125 VDC	125VDC	55 VDC	55 VDC
Charging/Load Current @ 25 °C	35 amps DC continuous		40 amps DC continuous			60 amps DC continuous	
Recommended Breaker Size with Recommended Wire Size in Conduit	60 amps DC, #6 AWG		60 amps DC, #6 AWG			60 amps DC (100% continuous duty cycle), #6 AWG (90 °C rated)	
General Specifications							
Maximum Peak Current	85 amps intermittently-electronically protected						
Maximum Voltage Drop	0.30 volts - charge control mode						
Total Current Consumption	While operating - 15 ma (typical), at idle - 3 ma (tare)						
Charge Regulation Method	Solid state, 3-stage (Bulk, Absorption and Float) Pulse Width Modulation (PWM)						
Regulation Adjustment Settings	Charge Control Mode Setup for:						
Lead Acid Battery	12 Volt Configuration: Float 12.5 –14.5 VDC Bulk 13.0 –15.0 VDC EQ + 1 VDC above Bulk		24 Volt Configuration: Float 25.0 –29.0 VDC Bulk 26.0 –30.0 VDC EQ + 2 VDC above Bulk			48 Volt Configuration: Float 50.0 –58.0 VDC Bulk 52.0 –60.0 VDC EQ + 4 VDC above Bulk	
NiCad Type Battery (VDC above adjustment setting)	Float or Bulk (add 2 VDC)		Float or Bulk (add 4 VDC)			Float or Bulk (add 8 VDC)	
Load Control Mode	Low Voltage Reconnect (LVR) - Subtract 1 V (for 12 VDC systems), 2 V (for 24 VDC systems), and 4 V (for 48 VDC systems) from the Bulk setting Low Voltage Disconnect (LVD) - Subtract 2 V (for 12 VDC systems), 4 V (for 24 VDC systems), and 8 V (for 48 VDC systems) from Float setting						
Standard Features							
Status Indicator	Multicolor LED indicates the operating/battery voltage status						
Low Voltage disconnect (Load Control Mode)	User selectable manual or automatic reconnection - includes warning flash before disconnect and provides a "grace" period.						
Equalization Charge (Charge Control Mode)	User selectable manual or automatic equalization (every 30 days)						
Short Circuit Protection	Fully electronically protected with auto-reset						
Field Adjustable Control Setpoints (test points provided for high accuracy)	Two user adjustable voltage setpoints for control of loads or charging sources (settings retained if battery is disconnected)						
Options							
LCD Meter Panel (CM, CMR/25 CMR/50, CMR/100)	Back-lit, 2-line, 32 character, alpha numeric liquid crystal display panel for remote (CMR/XX) or front mounting (CM) on the C Series controller. CMR/25 includes 25' (7.5 m) of cable. CMR/50 includes 50' (15 m) of cable, CMR/100 includes 100' (30 m) of cable. Displays: battery voltage, DC amperage, cumulative amp hours, amp hours since last reset						
External Battery Temperature Sensor (BTS/15, BTS/35)	Provides automatic adjustment of the charge control setpoints to the battery temperature. BTS/15 is supplied with 15' (4.5 m) of cable, BTS/35 cable length is 35' (11 m)						
Physical							
Enclosure Type	Indoor, ventilated, powder-coated steel with 3/4" and 1" knockouts						
Specified Temperature Range	32 to 104 °F (0 to +40 °C)						
Allowed Temperature Range	-67 to 167 °F (-55 to +75 °C)						
Altitude Limit (operating)	15,000 feet (5,000 meters)						
Altitude Limit (non-operating)	50,000 feet (16,000 meters)						
Dimensions (H x W x D)	C35: 8" x 5" x 2.5" (20.3 cm x 12.7 cm x 6.35 cm) C40, C60: 10" x 5" x 2.5" (25.4 cm x 12.7 cm x 6.35 cm)						
Mounting	Vertical Wall Mount						
Weight (Controller only)	C35: 2.5 lbs (1.2 kg), C40: 3.0 lbs (1.4 kg), C60: 3.0 lbs (1.4 kg)						
Weight (Shipping)	C35: 3.0 lbs (1.4 kg), C40: 3.5 lbs (1.6 kg), C60: 3.5 lbs (1.6 kg)						
Certifications	UL Listed to UL 1741 and CSA 22.2 107.1-95. CE Compliant, Designed to CTIK Standards.						
Warranty	All C35, C40 and C60 controllers are warranted for two years against defects in workmanship and materials.						

## APPLICATIONS

Solar electric systems  
Hydro electric systems  
Wind turbines  
Hybrid systems

## OPERATING MODES

3-stage PWM Battery Charging Control  
DC Load Control  
DC Diversion Control

## CERTIFICATIONS

UL to 1741  
cUL to CSA 22.2 107.1-95  
CE Compliant  
Designed to CTIK standards

## WARRANTY

2 years workmanship and materials.

Specifications subject to change without notice. Specifications at 25 °C

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