



## Intelligent Charging System Series

### OWNER'S MANUAL

### ON BOARD BATTERY CHARGERS

<b>Models</b>	<b>Amperage</b>	<b>No. Of Banks</b>	<b>Volts</b>
<b>16061</b>	6 Amps	1 Bank	12
<b>16102</b>	6,6 Amps	2 Banks	12 or 24
<b>16153</b>	6,6,6 Amps	3 Banks	12 or 24 or 36
<b>16202</b>	10,10 Amps	2 Banks	12 or 24

### **IMPORTANT NOTICE**

This manual contains important safety and operating instructions for the charger. Read the entire manual before using. Also read all instructions and cautions for and on the charger, batteries and equipment in the vicinity of the batteries.

***SAVE THESE INSTRUCTIONS***

# IMPORTANT SAFETY INSTRUCTIONS

This manual contains important safety and operating instructions for the charger. Read the entire manual before using. Also read all instructions and cautions for the charger, batteries and equipment in the vicinity of the batteries.

## ***WARNINGS***

**THIS CHARGER SHOULD BE USED TO CHARGE ONLY FLOODED LEAD ACID, AGM OR GEL CELL TYPE BATTERIES. USE ON OTHER BATTERY TYPES MAY CAUSE THE BATTERY TO EXPLODE AND CAUSE PERSONAL INJURY.**

**RISK OF EXPLOSIVE GASES! WORKING IN THE VICINITY OF LEAD ACID BATTERIES IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL OPERATION. THEREFORE IT IS OF THE UTMOST IMPORTANCE THAT EACH TIME BEFORE USING YOUR CHARGER YOU FOLLOW THE INSTRUCTIONS EXACTLY.**

## **AC Connection and Grounding Precautions**

### ***DANGER***

**DO NOT OPERATE THIS CHARGER WITH A TWO BLADED ADAPTER PLUG OR EXTENSION CORD. DOING SO CAN RESULT IN SERIOUS PERSONAL INJURY. AFTER SECURING THE BATTERY CONNECTIONS, PLUG THE AC LINE CORD INTO AN AVAILABLE AC OUTLET THAT IS PROTECTED BY A GROUND FAULT CIRCUIT INTERRUPTER (GFCI) BREAKER.**

### ***CAUTION***

**TO REDUCE THE RISK OF SHOCK, CONNECT ONLY TO A PROPERLY GROUNDED OUTLET**

**NOTE:** AC Line Cord color-coding is EU style. Line = Brown, Neutral = Blue, Ground = Green

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# INTRODUCING THE CHARGER

The Guest models 16061, 16102, 16153, 16202 are microprocessor controlled, 3-stage electronic switching battery chargers. Each output produces 12 Volts DC at either a full 6 Amps or 10 Amps (model specific), while using much less AC current than other chargers. Pre-wired on the AC input and DC outputs, these units feature a push button interface that allows the user to configure individual outputs for different battery chemistry types. One tri-color LED per output will indicate which battery chemistry type has been selected. Tri-color LED readout indicates state of charge for each bank. Unlike automotive “trickle” chargers, the 16061, 16102, 16153, 16202 will not boil off the electrolytes in properly installed and maintained batteries. When the charger is connected to your batteries and plugged into a standard 115 Volt / 60 Hz AC outlet, the tri-color LED (red, blue, green) mounted on the face of the charger will let you know the unit is *recharging* and *maintaining* your batteries. This sophisticated device is ideal for recharging and maintaining the 12VDC batteries in your boat, electric vehicle, ATV, snowmobile and motorcycle.

## Personal Safety Precautions

Adhere to the following personal safety precautions when installing or working with the chargers:

1. Someone should be within voice range or close enough to come to your aid when you work near a lead-acid battery.
2. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
3. Wear complete eye protection and clothing protection. Avoid touching eyes while working near a battery.
4. If battery acid contacts skin or clothing, wash them immediately with soap and water. If acid enters the eye, flood the eye with cold, running water for at least ten minutes and get medical attention.
5. Never smoke or allow an open flame in the vicinity of the battery.
6. Do not drop a metal tool onto the battery. It may short-circuit the battery, spark and may cause an explosion.
7. Remove all personal metal items such as rings, bracelets, necklaces, and watches when working near a lead-acid battery. A battery can produce short circuit currents high enough to weld a ring or the like to metal, causing a severe burn.

### **Preparing to Charge Precautions**

Before charging a battery with the charger, read the following precautions:

1. Do **NOT** operate the charger if the cable or an LED indicator is damaged.
2. Make sure all accessories on the product you are charging are **OFF**.
3. If the battery or batteries must be removed from the product, always remove the grounded terminal from the battery first.
4. Be sure the area around the battery is well ventilated while the battery is being charged. Gas can be forcefully blown away using a piece of cardboard or other non-metallic material as a “hand fan”.
5. Clean battery terminals. Be careful to keep corrosion from coming into contact with eyes.
6. Add distilled water in each cell until battery acid reaches levels specified by the battery manufacturer, if applicable. Do not overfill. Check water levels frequently. For a battery without cell caps, carefully follow the manufacturer’s recharging instructions.
7. Never allow the charger battery connection ring terminals to touch each other.
8. **NEVER** charge a frozen battery.

## **INSTALLING THE CHARGER**

**Note:** The initial installation consists of (a) Choosing a mounting location, (b) mounting the charger, (c) making the DC connections, (d) selecting the appropriate battery chemistry, (e) making the AC connections to a receptacle that is protected by a GFCI breaker.

### **Choosing a Mounting Location**

The charger should have at least eight inches of unobstructed area on all sides of the unit for effective cooling. The case of this charger may become warm during operation. For optimum performance, mount the charger in the vertical position (cables on the bottom), this will improve the convection cooling (airflow over the back of the charger). Mounting on its side or on a horizontal surface may cause the charger to slightly reduce amperage output due to the thermal protection built in. Do not install the charger on carpeted, upholstered, or varnished surfaces.

## Mounting the Charger

1. For 16061 use corrosion resistant #10 bolts, backed by a flat washer, and secured to the mounting surface with a split-ring lock washer.  
For the 16102, 16153 and 16202 use corrosion resistant ¼” bolts, backed by a flat washer, and secured to the mounting surface with a split-ring lock washer.
2. Hold the charger to the mounting surface and mark the holes.
3. Remove the charger and drill the mounting holes.
4. Align the charger and assemble the mounting hardware. Secure.

## Making the DC Connections

Check polarity of the battery posts. The POSITIVE (POS., P, +) battery post usually has a larger diameter than the NEGATIVE (NEG., N, -) post. Connect Red charger output wire to POSITIVE post, Black charger wire to NEGATIVE. See below diagrams for more details.

## Setting Up the Battery Chemistry

**Note:** The battery chemistry needs to be set for each individual battery bank or charger output.

The battery chemistry indicators are defined as follows:

Flooded Lead Acid (FLA) and AGM Battery Mode	Red LED
Safe Mode	Blue LED
Gel Battery Mode	Green LED

After you connect the DC cables of the charger to the batteries, the battery chemistry selection LED will illuminate (Safe Mode). At this point, you can toggle thru the different battery chemistry selections by pressing the pushbutton on the membrane panel for each specific output. Once AC is plugged in, this setting will be set by the micro into RAM and it will remember this setting until you interrupt both the battery power and AC power to the charger.

The battery chemistry selection LED will turn OFF 10 minutes after the batteries are first connected; this is called “sleep mode”. To recover from “sleep mode” press the battery chemistry selection button, this will turn ON the battery chemistry selection LED as long as AC power has not yet been applied.

The battery chemistry select LED will turn ON once AC has been applied to the charger and turn OFF 10 minutes after AC has been disconnected.

If you do not know what type of battery you have, please choose the safe mode algorithm, which was developed for an unknown battery chemistry or application requirement.

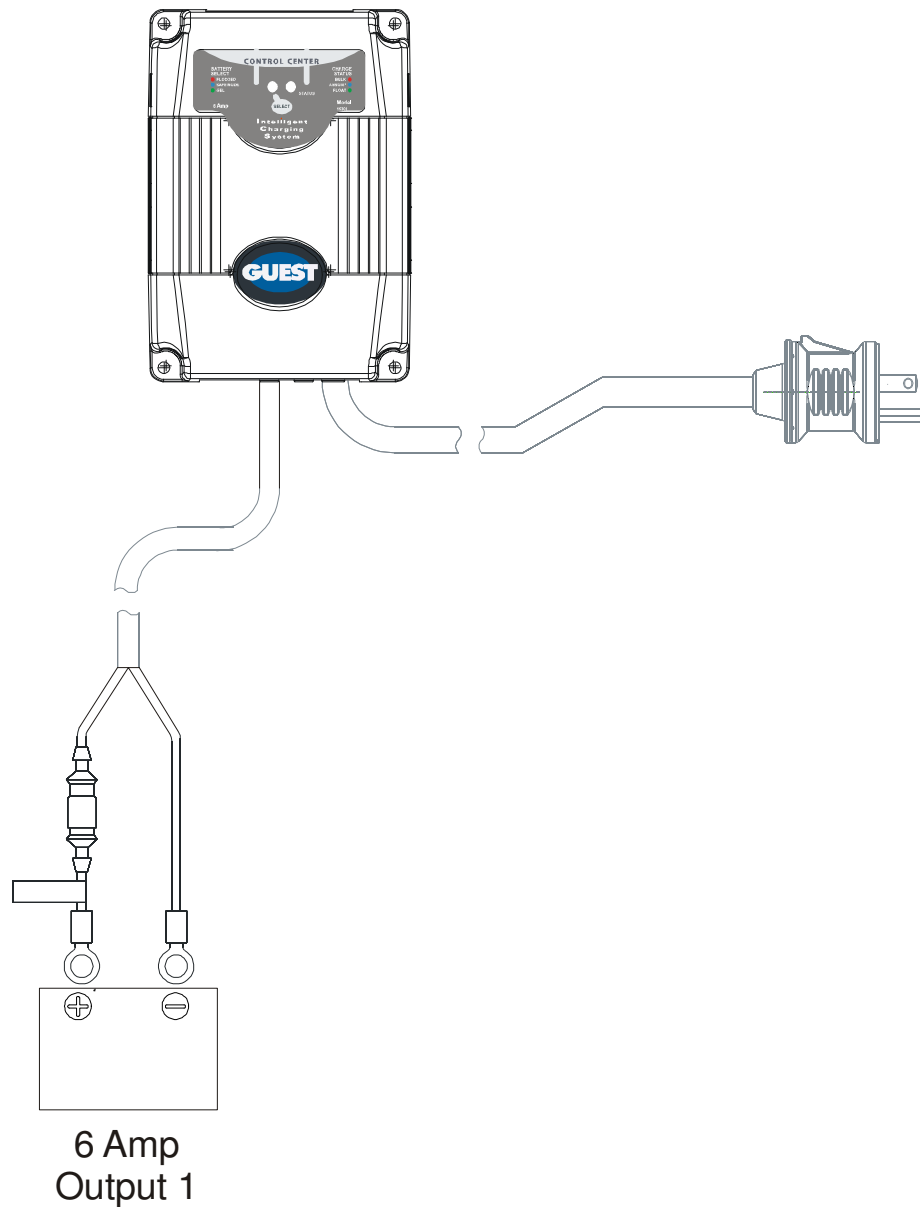
## Making AC Connection

After setting your battery chemistry selections for each output, connect the AC plug into an AC receptacle, which is protected by a Ground Fault Circuit Interrupter (GFCI) breaker.

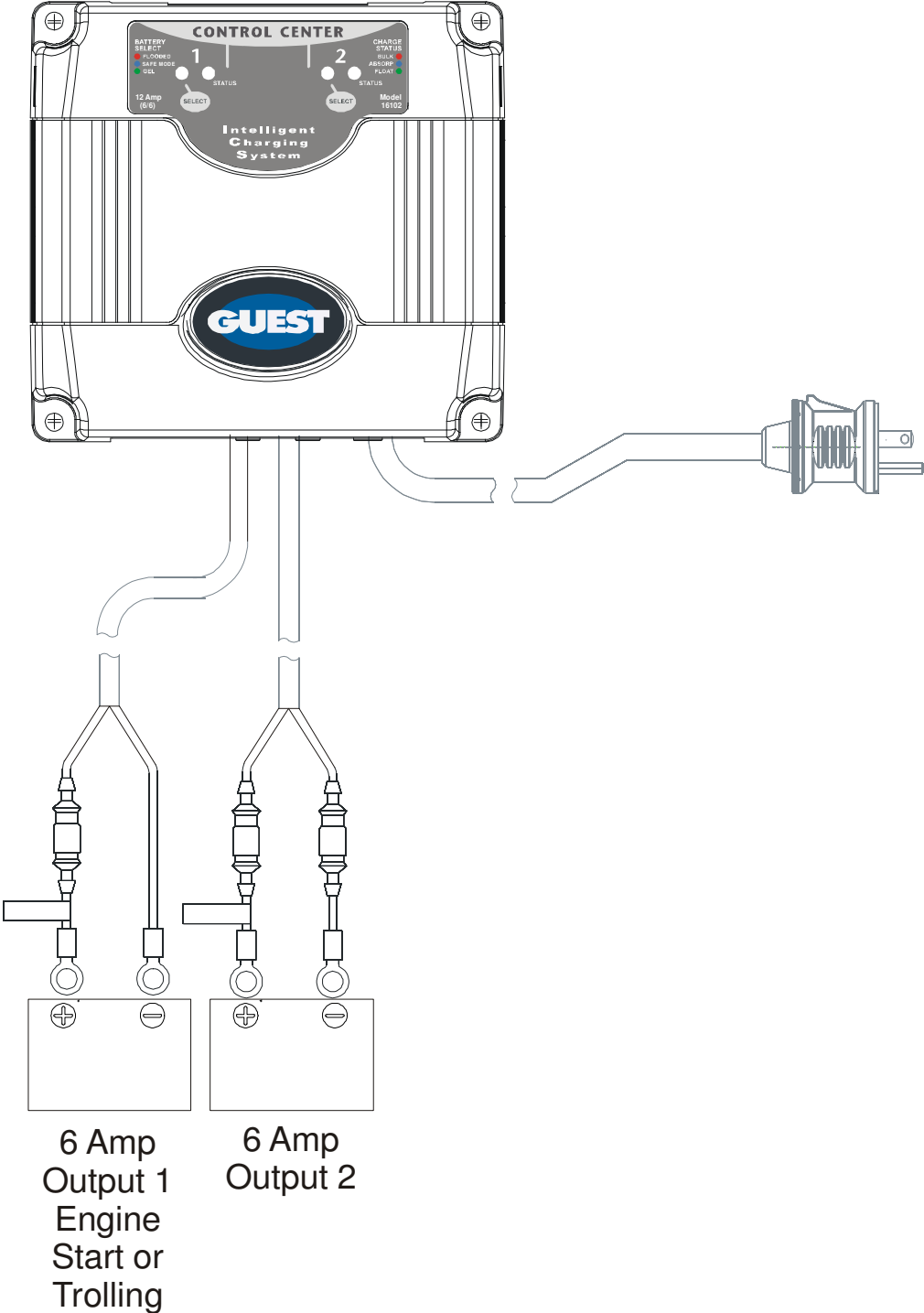
## DC Output Wiring Configurations

This section shows possible DC wiring configurations for the following charger models: 16061, 16102, 16153, and 16202.

### Diagram 1 – 16061 in a single Independent Output configuration

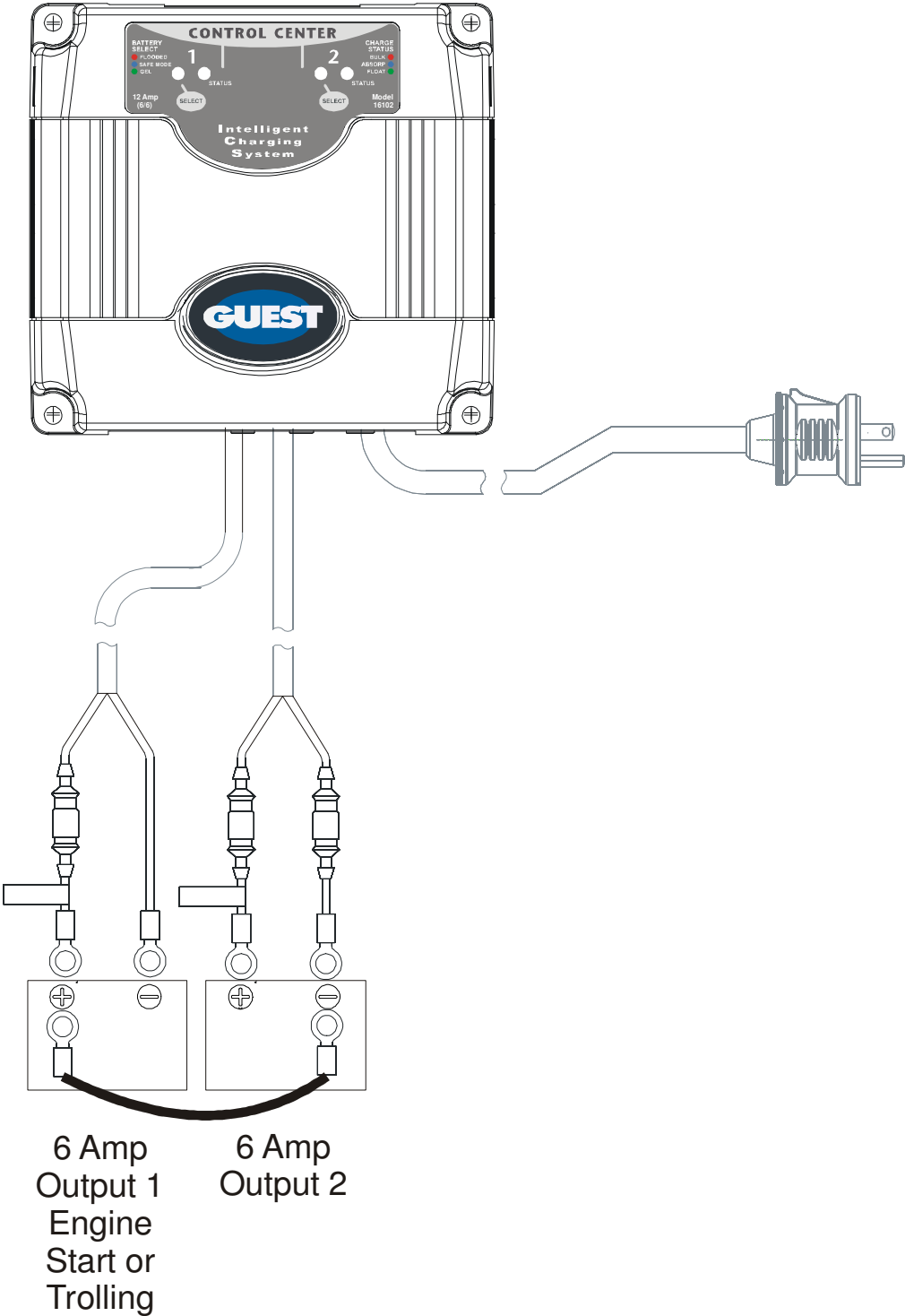


# Diagram 2 – 16102 in a dual Independent Output configuration

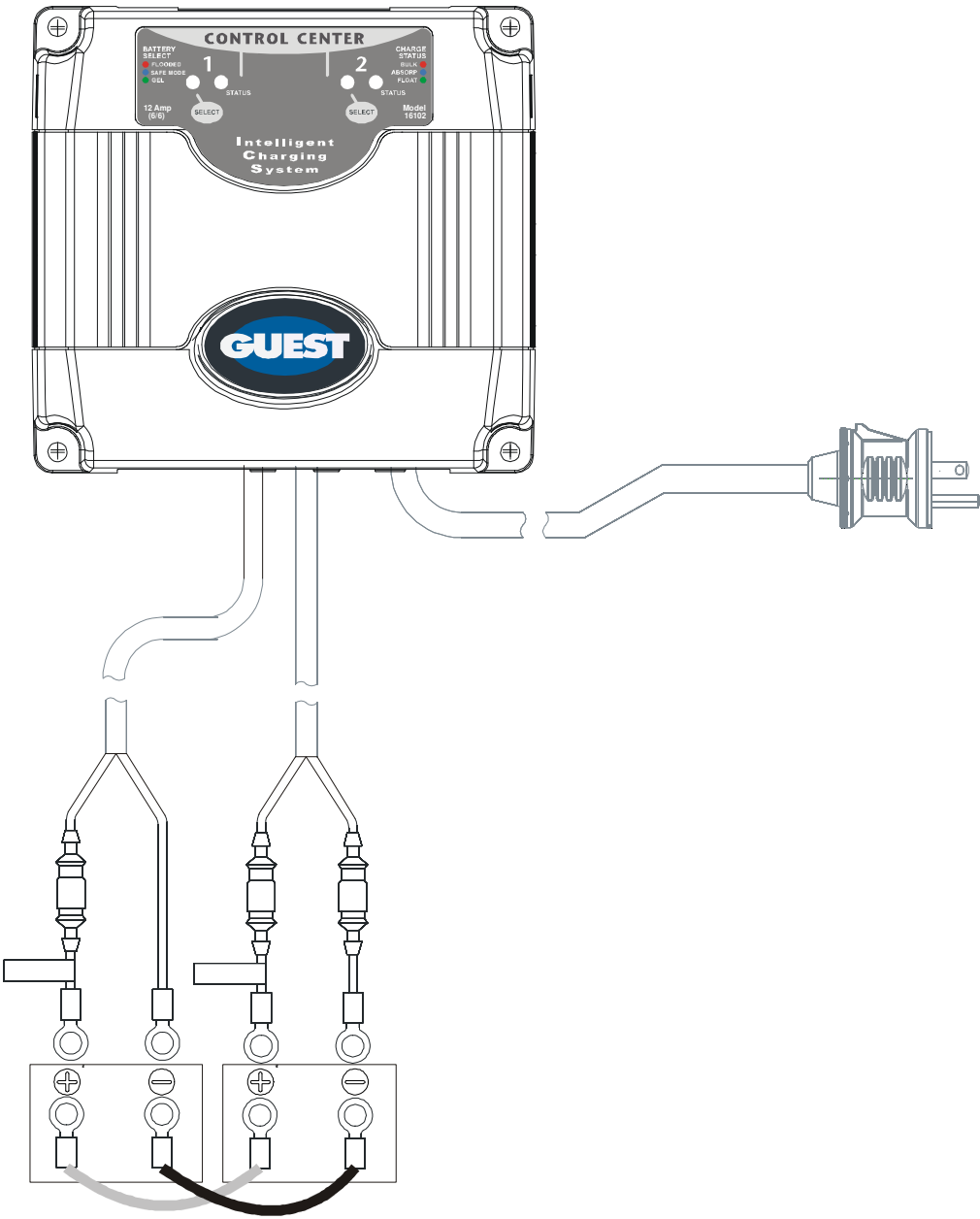




# Diagram 3 – 16102 in a 24VDC, 6 Amp configuration



# Diagram 4 – 16102 in a 12VDC, 12Amp configuration



6 Amp  
Output 1  
Engine  
Start or  
Trolling

6 Amp  
Output 2

**Diagram 5 – 16153 in a triple Independent Output configuration**

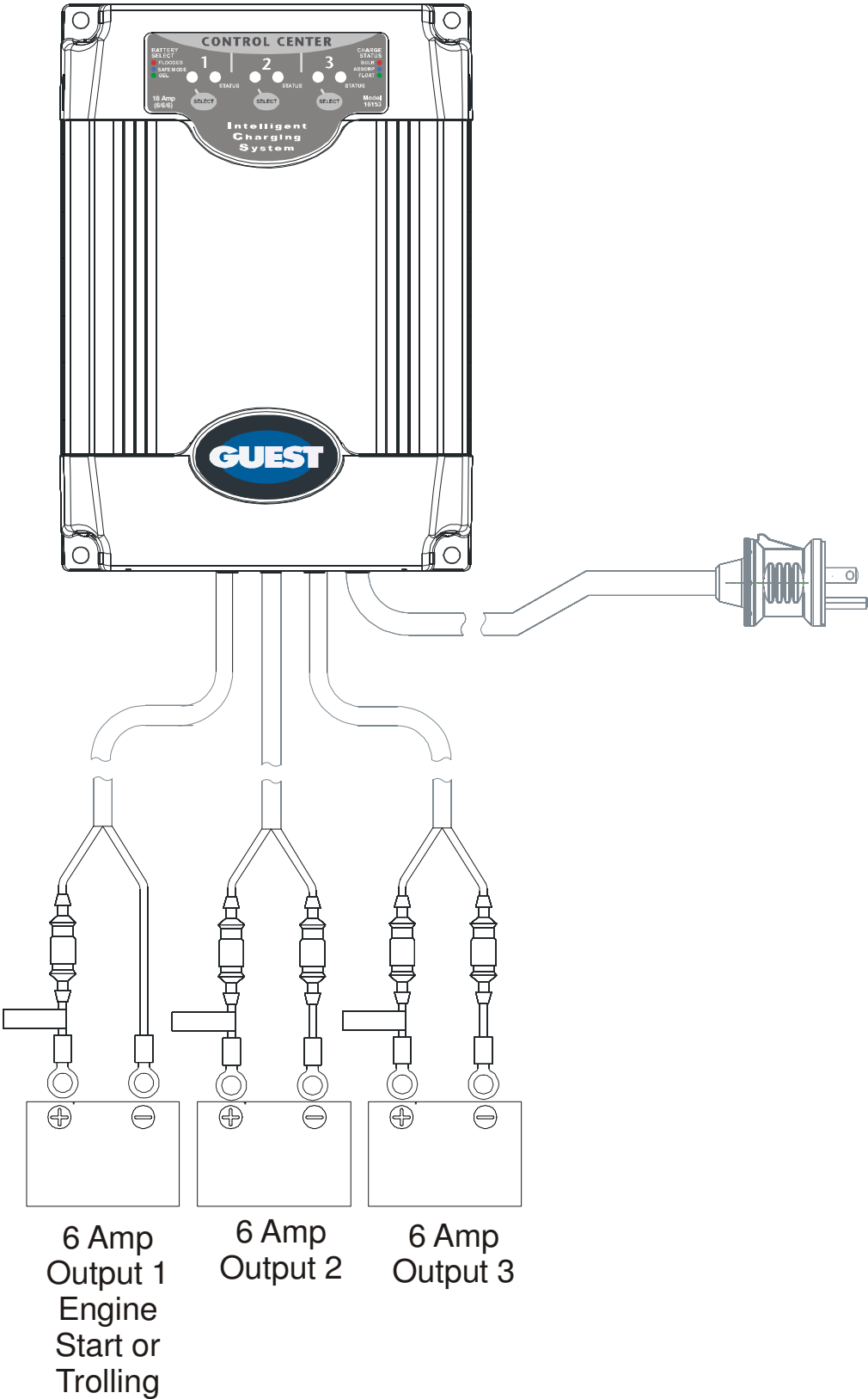


Diagram 6 – 16153 in a 36VDC, 6Amp configuration

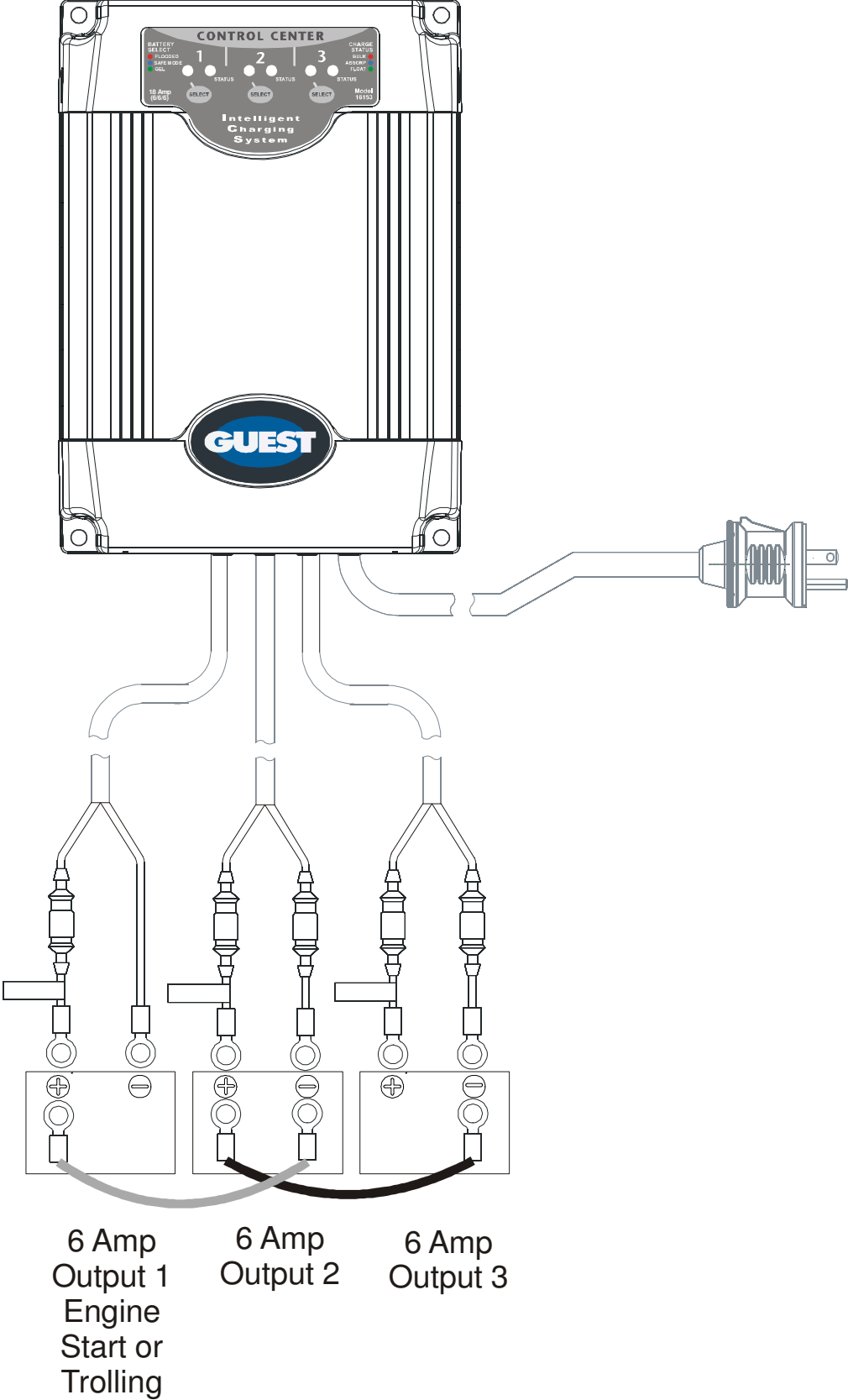
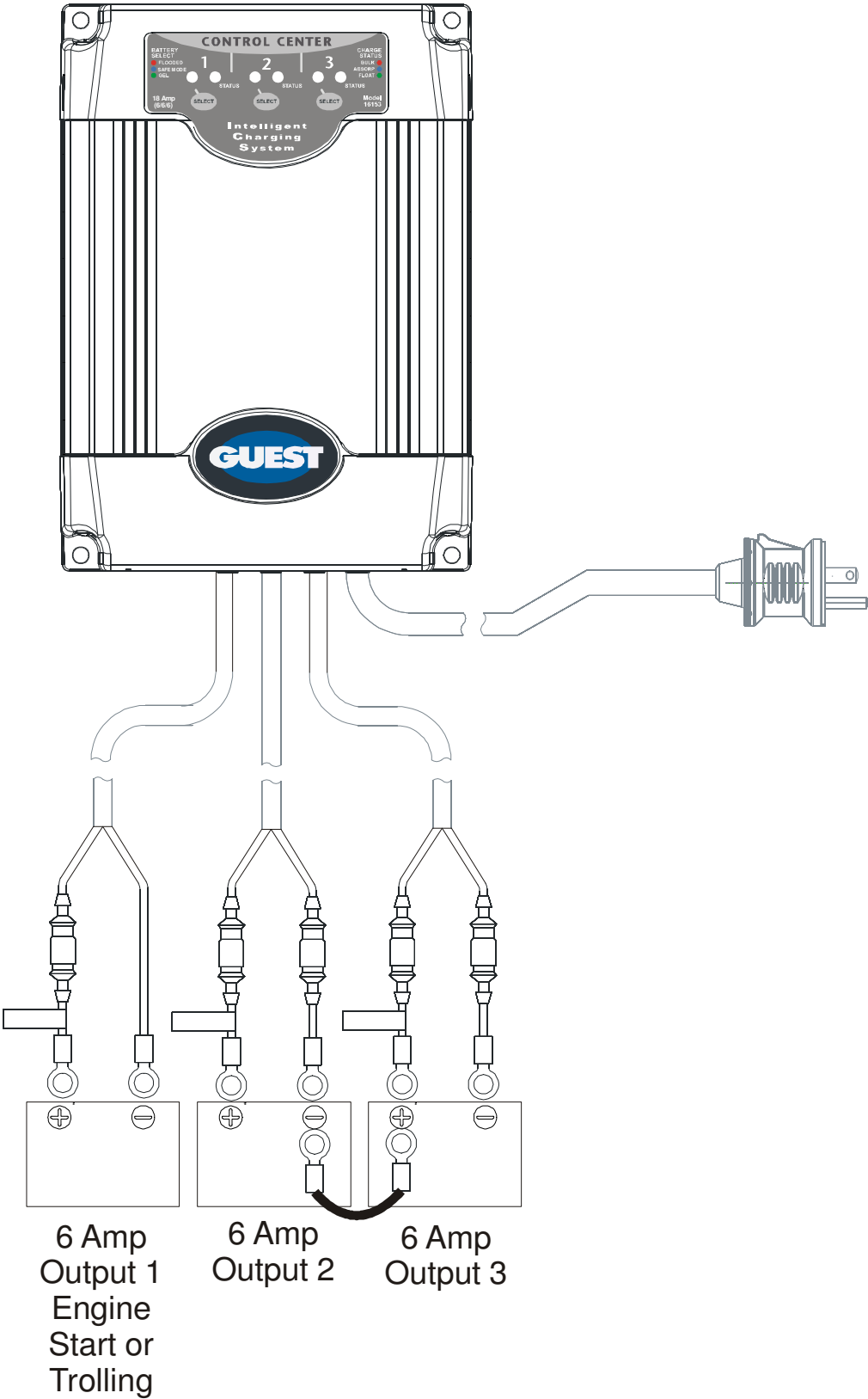


Diagram 7 – 16153 in a 12VDC, 6Amp and 24VDC, 6Amp configuration



**Diagram 8 – 16153 in a 12VDC, 6Amp and 12VDC, 12Amp configuration**

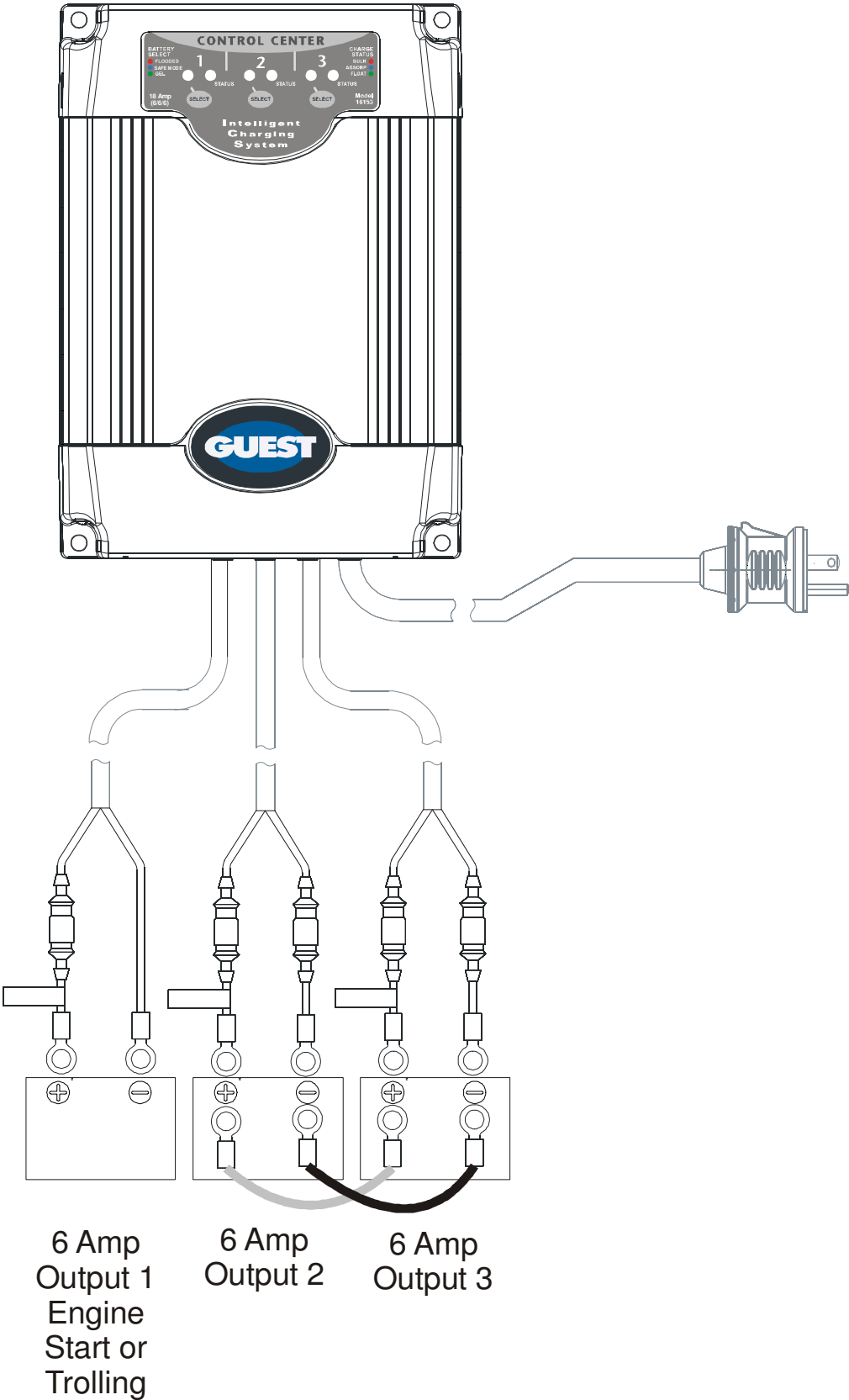


Diagram 9 – 16153 in a 12VDC, 18Amp configuration

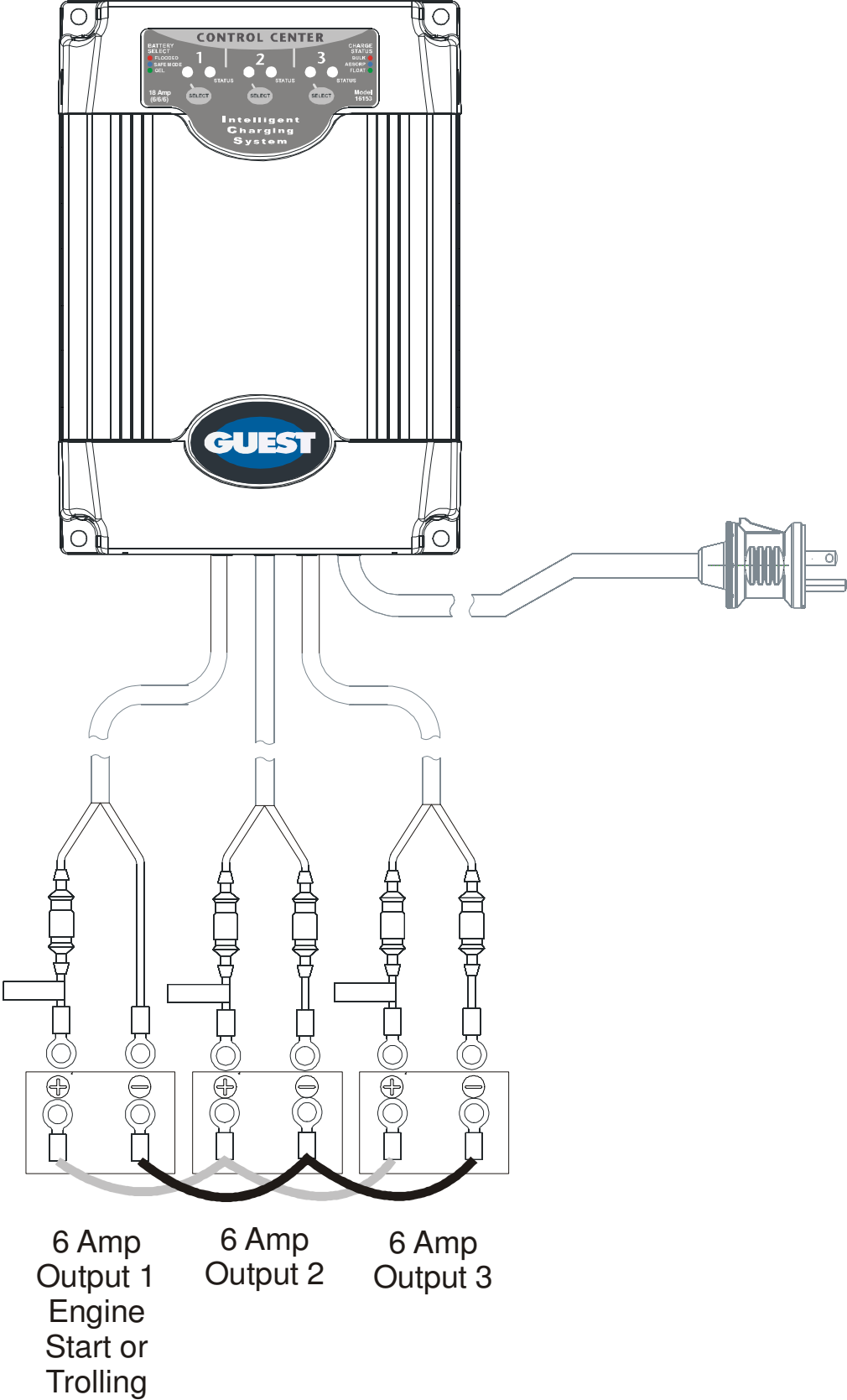


Diagram 10 – 16202 in a dual Independent Output configuration

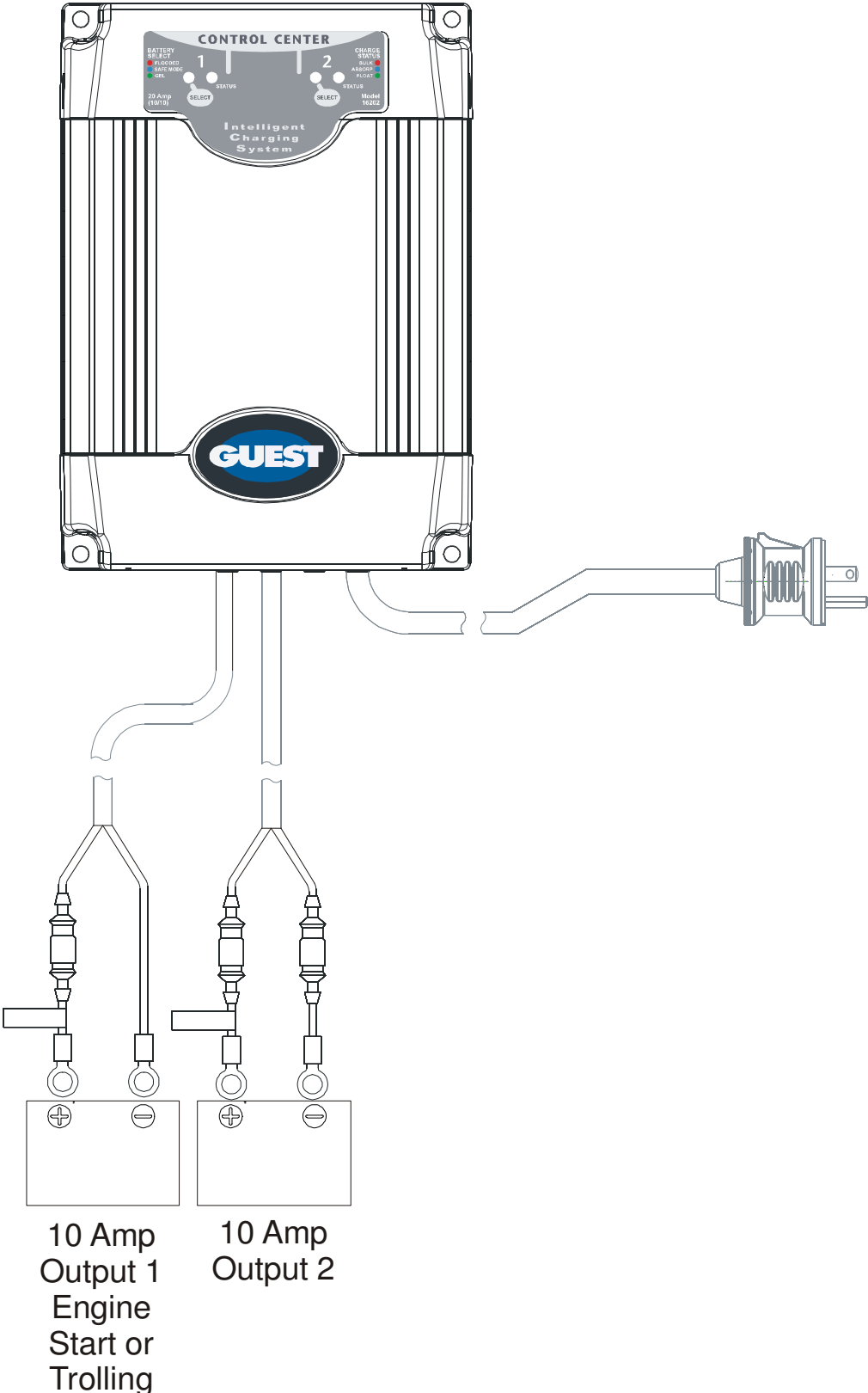




Diagram 11 – 16202 in a 24VDC, 10Amp configuration

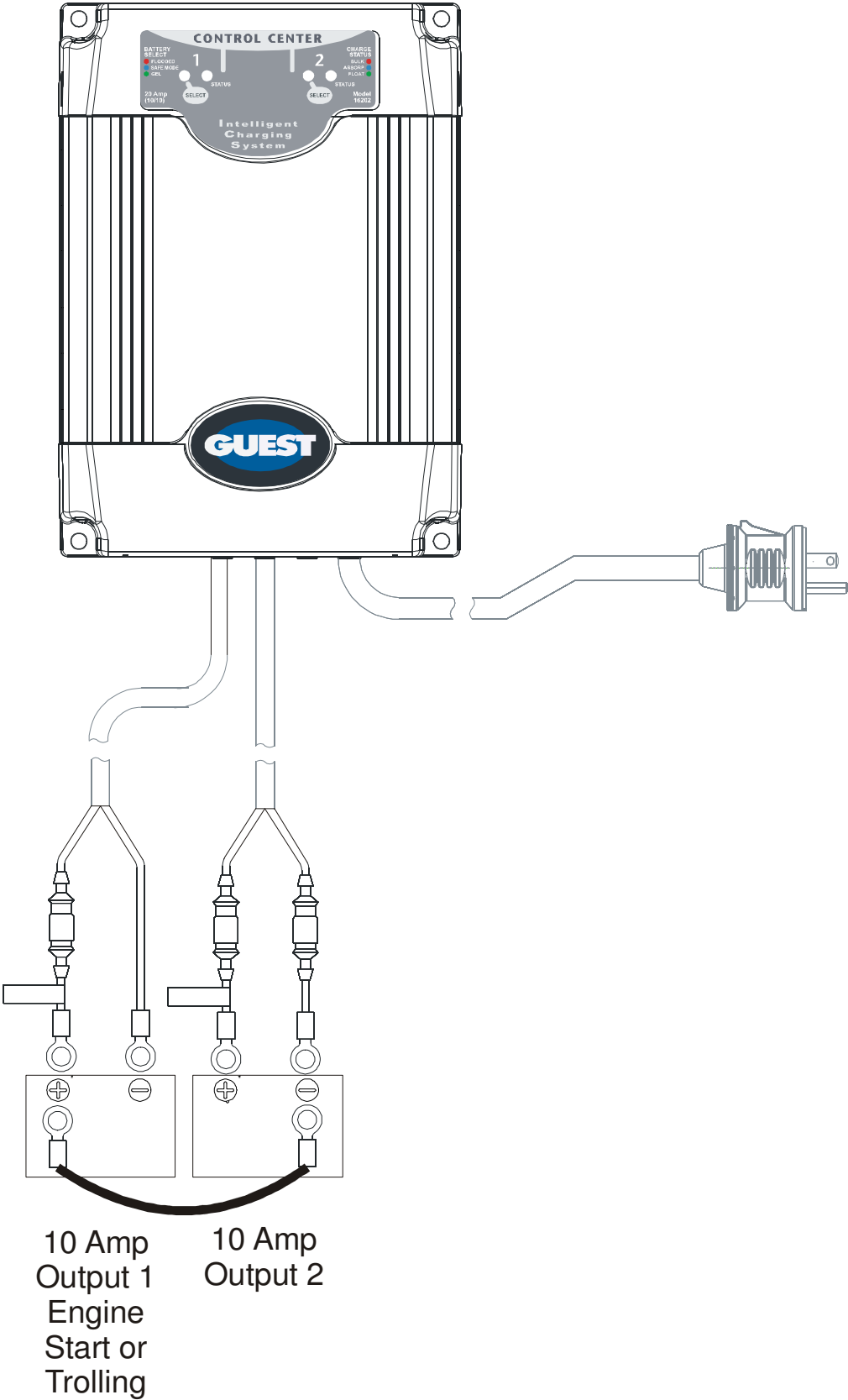
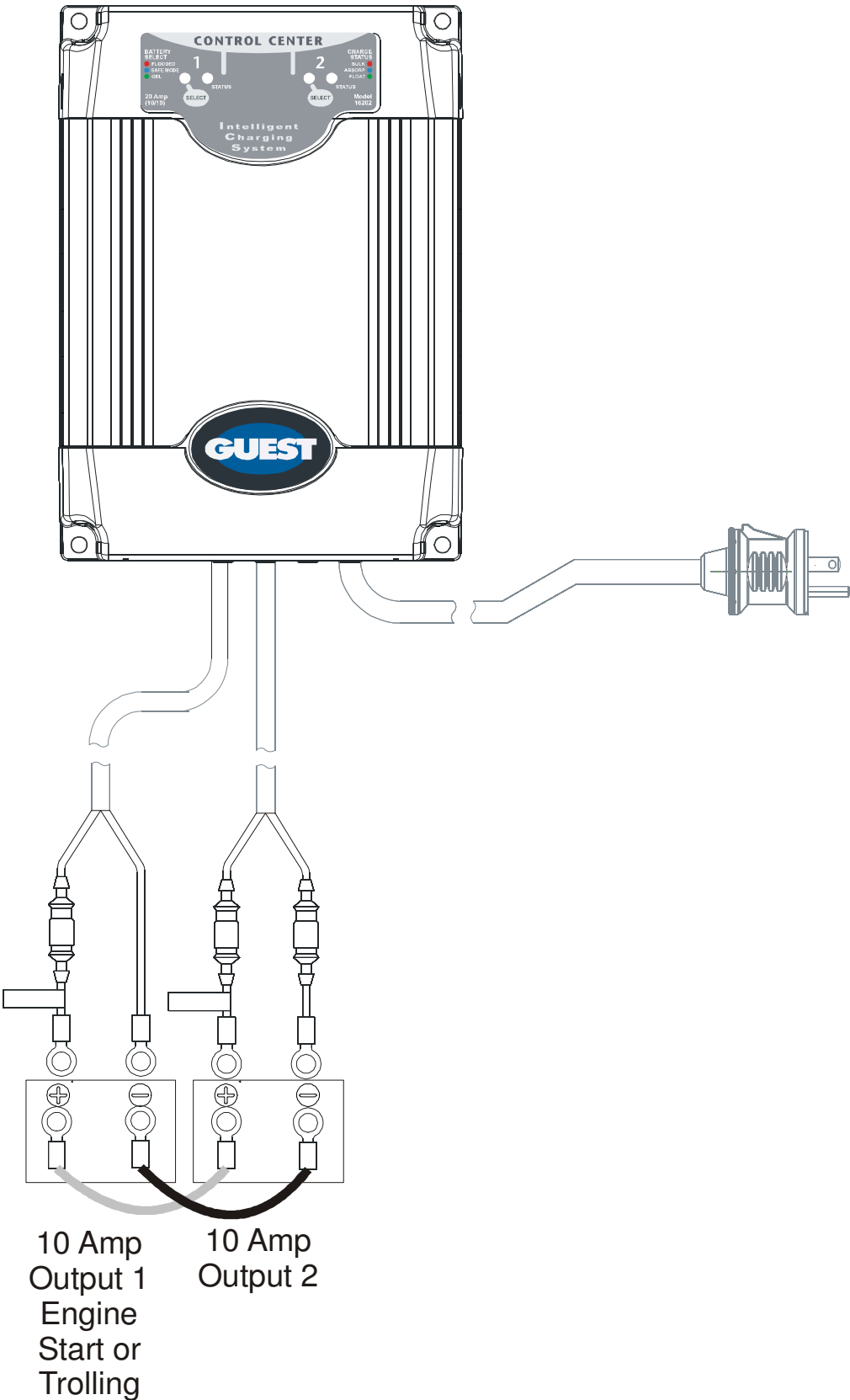


Diagram 12 – 16202 in a 12VDC, 20Amp configuration



# OPERATING THE CHARGER

The **LED Function Chart** below describes the charging process for both the 6amp and 10amp charger models.

<b>Charger Status LED Display</b>	<b>Operating condition</b>
RED	<p>When the red LED is on, it indicates that your battery is discharged and the battery charger is recharging the battery at the "Bulk" rate (stage 1). This charging rate is approximately 6 to 10Amps depending on specific charger model.</p> <p>While the red LED is on, the battery charger will provide the maximum charger current rating until the battery voltage reached the maximum bulk voltage for the selected battery chemistry according to Table 1.</p> <p>If an excessive amount of time is taken to complete this stage, the charger will time out and present a fault indicator. (see Troubleshooting Section.)</p>
BLUE	<p>When the blue LED is on, it is charging at the "absorption" rate. (Stage 2). During this second charging stage, the charger holds the battery voltage at the specified battery chemistry absorption stage voltage according to Table 1 and gradually reduces the amount of current delivered to the battery.</p> <p>If an excessive amount of time is taken to complete this stage, the charger will time out and automatically transition into the "float" stage.</p> <p>The Intelligent Charging System Series uses the internal micro-controlled timers to transition the charger output voltage from absorption stage to float stage to protect the battery from electrolyte depletion. In the float stage the charger can still supply full output current to battery and external loads.</p>
GREEN	<p>When the green LED is on, the charge cycle is completed and the battery is ready for use. The optimum replenishment of charge has been returned to the battery.</p> <p>The charger will regulate the battery at the nominal float stage voltage specified in Table 1.</p> <p>The charger will be able to supply maximum charger output current during this stage for external DC loads. External DC loads may cause the regulated voltage to drop, if the battery voltage falls below approximately 12.6VDC, the charger will automatically restart the charge process.</p>

**Table 1 - Charger Stage Approximate Voltage Specifications  
Based on Battery Chemistry Selected**

3-Battery Chemistry Selections				
Stage	3-Stage Algorithm	Flooded Lead Acid (FLA)/AGM	GEL	Safe Mode *
1	Bulk Stage**	14.4VDC	14.1VDC	14.0VDC
2	Absorption Stage	14.4VDC	14.1VDC	14.0VDC
3	Float Stage	13.5VDC	13.8VDC	13.4VDC

\*The safe mode algorithm was developed for the individual who is unable to identify their battery chemistry or application needs.

\*\*The charger bulk stage voltages may vary based on the voltage drops across the DC cable

### **Battery Fault Indication**

The blinking red LED of the respective Charge Status LED will serve as the fault indicator. Fault indication is defined as follows:

<b>Charge Status RED LED</b>	<b>Indication</b>
1 X Blink	No Battery Present
3 X Blink	14hr. Bulk Stage Timer has Expired
5 X Blink	Corrupt program memory

# TROUBLESHOOTING

Problem	Cause	Solution
Charger status <b>RED LED</b> <b>Blinking 3 times</b> (14hr. Bulk Timer has expired).	<ol style="list-style-type: none"> <li>1. One or more defective or damaged cells.</li> <li>2. Charger has reduced its output voltage below the normal level due to a DC overload or a DC short.</li> <li>3. On-board DC systems are drawing more current than the charger can replace.</li> <li>4. Excessive ambient temperature has forced the charger to cutback output current in order to self protect.</li> </ol>	<ol style="list-style-type: none"> <li>1. Load test the batteries and replace if necessary.</li> <li>2. Remove the source of the overload or short. Disconnect the charger's black (NEGATIVE) ring terminal from the battery. Reapply AC power and the green LED only should now light.</li> <li>3. Turn off all DC equipment while charging.</li> <li>4. Determine the cause of the excessive ambient temperature and correct.</li> </ol>
Charger status <b>RED LED</b> <b>Blinking 5 times</b>	<ol style="list-style-type: none"> <li>1. Microprocessor check sum failure</li> </ol>	<ol style="list-style-type: none"> <li>1. Return charger to the Guest Service Dept.</li> </ol>
Charger status <b>RED LED</b> <b>Blinking 1 time</b> (No Battery Present)	<ol style="list-style-type: none"> <li>1. Open DC output fuse.</li> <li>2. Faulty or contaminated terminal connections.</li> <li>3. One or more defective or damaged cells.</li> <li>4. Reverse Polarity across the battery</li> <li>5. No battery present</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace DC output fuse with equivalent size.</li> <li>2. Clean and tighten or repair all terminal connections.</li> <li>3. Load test the batteries and replace if necessary.</li> <li>4. Replace the DC output fuse and correct the charger lead orientation.</li> <li>5. Connect DC output connections to battery</li> </ol>

## TROUBLESHOOTING (continued)

Problem	Cause	Solution
Charger Status <b>GREEN LED ON</b> when battery is not fully charged	<ol style="list-style-type: none"> <li>1. 8hr. Absorption Stage Timer Expired</li> <li>2. One or more defective or damaged cells.</li> <li>3. On-board DC systems are drawing more than 2 amps but less than the maximum charger current.</li> <li>4. At the end of charge cycle, the on-board DC systems are drawing more current than the charger can provide, but not enough to drop the battery voltage below approximately 12.6VDC</li> </ol>	<ol style="list-style-type: none"> <li>1. Load test the batteries and replace if necessary.</li> <li>2. Turn off all DC equipment while charging.</li> </ol>
Battery Chemistry Indicator is not identifying the correct battery chemistry	<ol style="list-style-type: none"> <li>1. AC power was applied before Battery chemistry selection was made.</li> <li>2. There was an interruption to both AC and DC battery power</li> </ol>	<ol style="list-style-type: none"> <li>1. Disconnect both AC and DC power. Reconnect DC connections to the battery and follow section Setting Up the Battery Chemistry</li> <li>2. Disconnect both AC and DC power. Reconnect DC connections to the battery and follow section Setting Up the Battery Chemistry</li> </ol>

## MAINTAINING THE CHARGER

Periodically clean both battery terminals with baking soda and tighten all connections. No other maintenance on the charger is required.

# SPECIFICATIONS

	MODEL NUMBERS			
Specs.	16061	16102	16153	16202
Input Volts (VAC)	95-135VAC, 50/60Hz	95-135VAC, 50/60Hz	95-135VAC, 50/60Hz	95-135VAC, 50/60Hz
Input Current (Amax)	2.5	3.5	4.5	5.0
Banks	1	2	3	2
Output Voltage Configurations (VDC)	12	12 or 24	12 or 24 or 36	12 or 24
Output Current (A)	6	6/6	6/6/6	10/10
DC Cable Length (ft)	4	4/4	4/4/4	6/6
Dimensions (DxWxH) (Inches)	2.4 x 4.9 x 7.0	3.0 x 7.1 x 6.6	3.0 x 7.1 x 9.8	3.0 x 7.1 x 9.8
Weight (lbs)	3.0	4.5	6.0	6.75
Operating Temperature	-20C to +50C (-4F to +122F)	-20C to +50C (-4F to +122F)	-20C to +50C (-4F to +122F)	-20C to +50C (-4F to +122F)
Storage Temperature	-40C to +85C (-40F to +185F)	-40C to +85C (-40F to +185F)	-40C to +85C (-40F to +185F)	-40C to +85C (-40F to +185F)
Battery Chemistry	FLA, AGM, Gel	FLA, AGM, Gel	FLA, AGM, Gel	FLA, AGM, Gel
AC Under voltage lockout and recover	80VAC shutdown and 90VAC recover	80VAC shutdown and 90VAC recover	80VAC shutdown and 90VAC recover	80VAC shutdown and 90VAC recover
Output Over Voltage Shutdown	16VDC	16VDC	16VDC	16VDC

## ADDITIONAL FEATURES

- Ignition Protected (USCF CFR 183.410)
- IP65 (Splash proof)
- Short Circuit and over current protected
- Reverse Polarity Protected
- Safely configured in series or parallel outputs
- Humidity: 100% (condensing) humidity soak for 96 hrs.
- Vibration and shock: Comply with UL991
- Fire Resistance: UL94V0
- Multi-bank chargers have a fuse located in the positive and negative legs for added protection (exception “engine start battery” bank only in positive leg)
- Remote Indicator Ready according to the following table:

Guest Charger Model Number	Guest Remote Indicator Model
16061	16001-RI
16102	16002-RI
16153	16003-RI
16202	16002-RI

### FCC Class A EMC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning this equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

---Reorient or relocate the receiving antenna.

---Increase the separation between the equipment and receiver.

---Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.



### **LIMITED WARRANTY**

For three (3) years from the date of original purchase, The Guest Co. will, at its discretion, repair or replace for the original consumer, free of charge, any parts found defective in material or workmanship.

Proof of purchase is required: A computerized register receipt is required. Hand-written receipts are not accepted for warranty proof of purchase. In the absence of a receipt, warranty period will be calculated from date of manufacture printed or stamped on the product.

There is no other expressed warranty. Implied warranties, including those of merchantability and fitness for a particular purpose, are limited to three years from the date of purchase. This is the exclusive remedy and consequential damages are excluded where permitted by law.

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