

# Deltran Battery Tender Battery Chargers®

High Frequency SMT Golf Car Models:  
12V 20A, 24V 20A, 36V 15A, & 48V 10A

Single Output



**Note:** Battery Tender High Frequency SMT Golf Car chargers are designed to accommodate the demanding charging requirements of high quality lead-acid batteries and should safely charge flooded & sealed AGM lead acid batteries.

**Always check with the battery manufacturer to get charging recommendations that are consistent with your application!**

**Deltran**

## The best way to eliminate sulfation is to prevent it!

Battery Tender® High Frequency SMT Golf Car chargers will fully charge a battery and maintain it at the proper storage voltage without the damaging effects caused by trickle chargers (especially sulfation).

- ◆ **BTP MICROPROCESSOR TECHNOLOGY**
- ◆ **5-STEP CHARGING (Initialization, Bulk, Absorption, Equalization, & Storage / Standby / Maintenance)**
- ◆ **SPARK PROOF**
- ◆ **SHORT CIRCUIT PROTECTED**
- ◆ **REVERSE POLARITY PROTECTED**
- ◆ **IMPROVED SHOCK & VIBRATION RESISTANCE**
- ◆ **2 YEAR WARRANTY (Material & Workmanship Only)**

### ORDERING INFORMATION

Deltran PART NO.	DESCRIPTION (Output DC Volts & Amps)
022-0167	12 Volt 20 Amp (Replaces PN 022-0160)
022-0168	24 Volt 20 Amp (Replaces PN 022-0159)
022-0169	36 Volt 15 Amp (Replaces PN 022-0151)
022-0170	48 Volt 10 Amp (Replaces PN 022-0154)

### TECHNICAL SPECIFICATIONS SUMMARY

<b>AC Input Voltage &amp; Frequency</b> (Both are Factory Settings)	<b>120 VAC, 50 / 60 Hz or 240 VAC, 50 / 60 Hz</b>
<b>DC Output Voltage</b>	<b>12, 24, 36, or 48 Volts</b>
<b>DC Output Current</b>	<b>20, 20, 15, or 10 Amps</b>

Charger Output Voltage Amplitudes throughout the entire charge algorithm, including absorption and float maintenance, are consistent with the optimum charging recommendations of the major lead-acid battery manufacturers.

**Maximum Operating Temperature** 50 °C Typical

**Charger Case Dimensions:** 13.25 in (337 mm) L x 7.75 in (197 mm) W x 3.375 in (86 mm) H Allow an additional 2 in (51 mm) on each end of the length dimension for safe bend of AC power cord strain relief and DC output cable harness.

**Shipping Weight with Cable Accessories** Approx: 10.0 lbs (4.6 kg)

**AC Input Hardware:** IEC-60320-13 Input Module. Mates with Detachable, Grounded AC Power Cord with NEMA-15 Plug & C-13 Connector.

**DC Output Hardware:** 2-pin terminal block. Ships with 6ft long harness with attached ring terminals for 3/8" studs. Fused at 25 Amps.

**Declaration of Conformity:** These battery charger products are designed to meet or exceed the requirements for both US and European electrical product safety compliance standards.

**Design Conformance & Revision:** All Deltran charger products are 100% inspected and electrically tested prior to shipment. **All Deltran battery charger designs are proprietary and subject to change without notice.** Deltran makes no specific claims nor does it either make or imply any specific guarantee or warranty with respect to either the physical configuration or performance of any of the battery charger products listed herein, including suitability for purpose or merchantability.

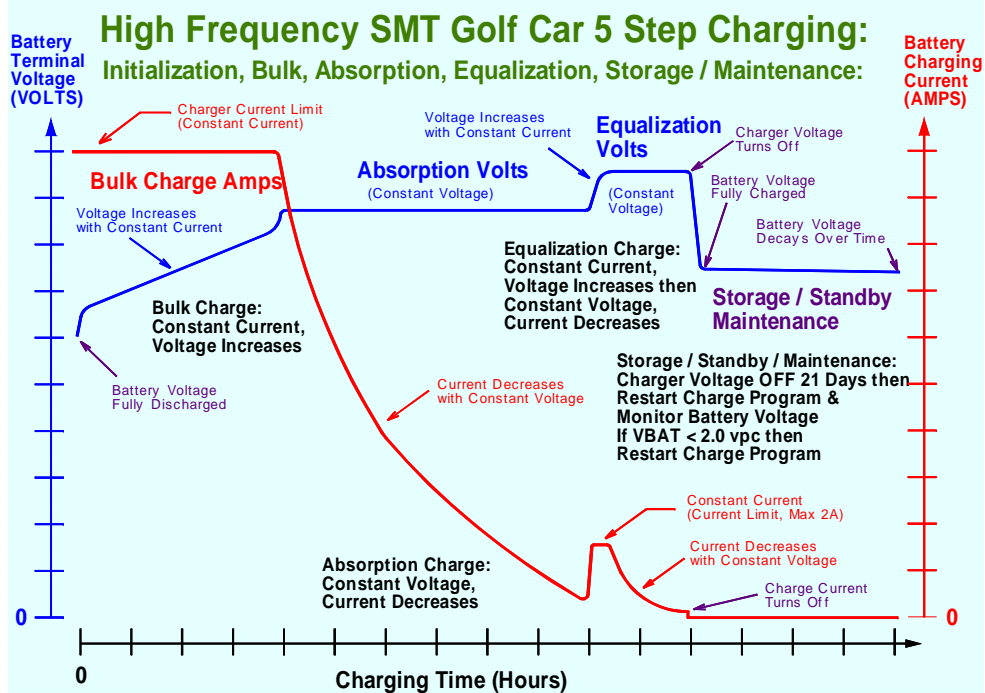
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- ### INDICATOR LIGHT OPERATION
- **AMBER (Yellow) Flashing** - When the amber light is flashing, the AC power is applied to the charger and the microprocessor circuitry is functioning properly. There is no battery connected or there is a problem with the connections between the charger and the battery.
  - **AMBER (Yellow)** - When the amber light is on, the charger is functioning normally and it is the process of fully charging the battery. The charger will automatically apply the optimum charging voltage and current values to the battery in the proper timing sequence.
  - **GREEN Flashing** - When the green light is flashing, the battery charger is in the absorption mode of operation. In this mode the charger maintains constant voltage & charge current decreases to maintenance levels.
  - **GREEN** - When the green light is on, the battery is either fully charged in the storage / maintenance mode or nearly fully charged in the equalization mode. Either way, the battery may be used at this time.
  - **RED** - When the red light is on, there is an internal charger malfunction or a battery malfunction preventing the charge program from finishing. If this condition persists, contact technical support for assistance.

CHARGER PROGRAM DESCRIPTION
<p><b>Step 1) Initialization:</b> 3 Indicator Lights Turn On in sequence: Green, then Green &amp; Amber, then Green, Amber &amp; Red for approx 1 second each. Also, Monitor Circuit verifies appropriate battery voltage levels and good electrical continuity between the battery and the charger DC output.</p>
<p><b>Step 2) Bulk Charge:</b> Amber Light On, Green Light Off: Constant Current at Full Power. Switch to Absorption at 75% - 80% full recharge. Maximum Bulk Charge Safety Timer = 50 Hours. <b>If Tbulk &gt; 50 Hrs, Error Condition Exists, Turn ON Red Light &amp; Turn OFF Amber Light.</b></p>
<p><b>Step 3) Absorption Charge:</b> Amber Light On, Green Light Flashing: Constant Voltage (MAX 2.47 vpc) This conditions the battery for maximum performance. Adaptive timing transition to equalization. Max Time = 75 Hours.</p>
<p><b>Step 4) Equalization Charge:</b> Amber Light Off, Green Light On Constant: Constant Voltage (MAX 2.617 vpc) Reduces battery cell voltage variation. Adaptive timing transition to storage / maintenance. Max Time = 2 Hours.</p>
<p><b>Step 5) Storage / Standby / Maintenance:</b> Amber Light Off, Green Light On: (No different from Equalization). Charge voltage &amp; current off for 21 days, unless battery voltage drops to less than 2.0 vpc. Then charger program resets. After 21 days max, charger program resets. This keeps the battery fully charged and maintains optimum specific gravity.</p>

- ### APPLICATION / TROUBLESHOOTING INFO
- ◆ Always operate the charger in a well ventilated area
  - ◆ If no indicator lights come on after you plug in the AC cord, then check the AC power receptacle.
  - ◆ If the AC power is disconnected, the LED indication maybe delayed several seconds up to 1 minute due to AC filter cap storage state. After the AC power comes back on, the charger program will reset.
  - ◆ If the green indicator light comes on in less than 2 minutes, check the battery and the output connections from the charger.
  - ◆ It will take a long time (possibly more than 24 hours, or even 96 hours) for the green light to come on when charging a large battery or a very large battery bank. The theoretical maximum time to steady green light = 127 hours. That would occur when charging a 500 Amp Hour battery bank with a 10 amp charger.
  - ◆ If the DC charger output connection to the battery is broken while the charger is operating normally with AC power applied, the Amber light will begin to flash, and the charger output voltage will be shut off. If the DC connection to the battery is restored, then the charger program will reset.



# DELTRAN BATTERY TENDER BATTERY CHARGER® HF SMT GOLF CAR

UNITS	TYPICAL RECHARGE TIMES FOR: BATTERY SIZE / CAPACITY (12 Volt)								
Reserve Capacity Minutes @ 25 Amps	40 to 65	70 to 120	100 to 130	125 to 215	140 to 215	225 to 260	265 to 300	280	
Amp Hours	30 to 45	50 to 85	70 to 95	95 to 125	100 to 155	160 to 185	190 to 215	150	
Group Size 12 VOLT	U1	24	27	31	4D	6D	8D	T-1245	

CHARGER PART #	VOLTS	AMPS	Automotive, Farm Equipment / SLI 12 VOLT	Automotive, Farm Equipment / SLI 12 VOLT	Automotive, Farm Equipment / SLI 12 VOLT	Marine, RV, Golf Car, or Industrial Vehicle 12 VOLT	Marine, RV, Golf Car, or Industrial Vehicle 12 VOLT	Marine, RV, Golf Car, or Industrial Vehicle 12 VOLT	Marine, RV, Golf Car, or Industrial Vehicle 12 VOLT	Golf Car, or Industrial Vehicle 12 VOLT
022-0167	12V	20A	1 to 2 Hours	2 to 3 Hours	3 to 4 Hours	3.5 to 5 Hours	4 to 6 Hours	6.5 to 7.5 Hours	7.5 to 8.5 Hours	6 Hours
022-0168	24V	20A	1 to 2 Hours	2 to 3 Hours	3 to 4 Hours	3.5 to 5 Hours	4 to 6 Hours	6.5 to 7.5 Hours	7.5 to 8.5 Hours	6 Hours
022-0169	36V	15A	1.5 to 2.5 Hours	2.5 to 3.5 Hours	4 to 5 Hours	5 to 7 Hours	5 to 8 Hours	8.5 to 10 Hours	10 to 11.5 Hours	8 Hours
022-0170	48V	10A	2.5 to 3.5 Hours	3.5 to 5 Hours	5.5 to 7.5 Hours	7 to 10 Hours	8 to 12 Hours	13 to 15 Hours	15 to 17 Hours	12 Hours

	UNITS	TYPICAL RECHARGE TIMES FOR: BATTERY SIZE / CAPACITY (6 & 8 V)								
<b>6 &amp; 8 Volt Batteries used Primarily in Golf Cars</b>	Reserve Capacity Minutes @ 25 Amps	380	445	485	530	500	260	295	340	
	Amp Hours	210	225	240	260	245	150	170	190	
	Group Size 6 & 8 Volt	T-605	T-105	T-125	T-145	TE35	T-860	T-875	T-890	

CHARGER PART #	VOLTS	AMPS	Golf Car, or Industrial Vehicle 6 VOLT	Golf Car, or Industrial Vehicle 6 VOLT	Golf Car, or Industrial Vehicle 6 VOLT	Golf Car, or Industrial Vehicle 6 VOLT	Golf Car, or Industrial Vehicle 6 VOLT	Golf Car, or Industrial Vehicle 8 VOLT	Golf Car, or Industrial Vehicle 8 VOLT	Golf Car, or Industrial Vehicle 8 VOLT
022-0167	12V	20A	8.5 Hours	9 Hours	9.5 Hours	10.5 Hours	10 Hours	6 Hours	7 Hours	7.5 Hours
022-0168	24V	20A	8.5 Hours	9 Hours	9.5 Hours	10.5 Hours	10 Hours	6 Hours	7 Hours	7.5 Hours
022-0169	36V	15A	11 Hours	12 Hours	13 Hours	14 Hours	13 Hours	8 Hours	9 Hours	10 Hours
022-0170	48V	10A	17 Hours	18 Hours	19 Hours	21 Hours	19.5 Hours	12 Hours	13.5 Hours	15 Hours

NOTE: All time to recharge values are approximate, based on typical performance ratings published by battery manufacturers.