



ENERGY STORAGE SOLUTIONS

for Renewable Energy / Hybrid Systems / Backup Power



Clean energy for life™

Made in USA





IMAGINE A WORLD OF CLEAN ENERGY FOR EVERYONE.

IN KENYA, A FAMILY GATHERS FOR DINNER IN A SMALL HOUSE POWERED BY AN OFF-GRID SOLAR HOME SYSTEM...

IN INDIA, AN ECO-RESORT GENERATES RELIABLE ELECTRICITY FROM A MICRO-GRID...

IN NICARAGUA, A RURAL TELECOM TOWER SUPPLIES COMMUNICATIONS TO REMOTE AREAS USING RENEWABLE ENERGY...

Renewable Energy (RE) installations are rapidly growing all around the world. Today, in developing regions where electricity is scarce, more than 1.6 billion people live without access to reliable electric power. In these areas, renewable energy provides a resource that allows children to learn, families to prosper and businesses to grow.

As the leading manufacturer of deep-cycle batteries, Trojan Battery Company believes it is possible to make a global shift to energy sources that are environmentally friendly and readily available worldwide. For more than 90 years, Trojan Battery has focused its experience and expertise in deep-cycle technology on manufacturing the highest quality, deep-cycle batteries available in the industry.

If there is one thing we've learned over the years, it's that a truly outstanding battery must provide maximum energy output, rugged durability, long life and reliable performance day in and day out. To address the issue of Partial State of Charge (PSOC), common in RE, telecom and inverter backup applications, Trojan's engineering team has developed Smart Carbon™, a proprietary formula of carbon additives designed to enhance life and performance of Trojan's Industrial and Premium lines of batteries operating in PSOC. Trojan Battery is the first manufacturer to introduce a carbon additive in deep-cycle flooded batteries for these applications.

Continuing our leadership role in the deep-cycle battery industry, Trojan now offers a true deep-cycle AGM battery. Trojan's Solar AGM is uniquely engineered for a wide range of markets that require deep-cycling power in a non-spillable battery design. As the only *true* deep-cycle AGM battery on the market today, Solar AGM is engineered with advanced technology features that provide outstanding sustained performance and total energy output, delivering the exceptional quality and reliability Trojan batteries are known for.

We understand the importance of these performance features, which is why we offer the largest portfolio of high-quality, deep-cycle flooded, AGM and gel products available for a wide range of renewable energy hybrid systems and backup power applications. With our vast array of renewable energy products, you'll find a Trojan battery perfectly suited to your application.

At Trojan Battery we are committed to... Clean Energy for Life.



Energy Storage Applications

Residential and Rural Electrification

Off-Grid Residential

Remote home sites with no access to electricity rely on Trojan's deep-cycle batteries to optimize their renewable energy systems and provide a reliable, cost-effective power source.

Inverter Backup Power

With tremendous demand on existing power grids, inverter battery backup systems are growing worldwide. Trojan battery backup systems paired with an inverter charger, provide stable and reliable power.

Solar Home Systems (SHS) and Rural Community Buildings

As renewable energy technologies become more affordable and available worldwide, those living and working off-grid with no or limited access to electricity can now use lights, appliances, medical equipment, or other electrical devices through use of solar systems combined with Trojan batteries for backup power.

Micro-Grids

Micro-grids powered by renewable energy sources generate a consistent electricity source for remote areas, with battery based energy storage provided by Trojan.

Grid-Backup

In the event of a power outage, your solar system coupled with a reliable backup power system allows you to power critical loads. Trojan deep-cycle batteries provide much longer backup times than typical uninterruptible power supplies (UPS) and unlike diesel generators, don't produce any noise.

Global Energy Projects

Case History Synopsis

Trojan's deep-cycle batteries are used by customers in a variety of markets for a wide range of applications including renewable energy, hybrid power and backup power. Read more about how Trojan batteries are providing Clean Energy for Life.

CASE STUDY	APPLICATION TYPE	COUNTRY	TROJAN BATTERIES PER SYSTEM	SYSTEMS INSTALLED
Telecom Base Transceiver Stations (BTS), American Tower and Quanta	Solar Powered Telecom	India	(24) L16RE-B Premium Line Flooded	11
Isla Bella Vista - Solar Home Systems (SHS)	Rural Electrification	Ecuador	(1) J185 Flooded	40
Spice Village Resort	Off-Grid Solar Eco-Resort	India	(72) IND29-4V Flooded	1
First Road Lit by Solar Energy in Wadi Sidr, Dubai	Solar Street Lighting	United Arab Emirates	(2) 8D VRLA	404
Diamond Bank Goes Solar	Solar-Powered ATMs	Nigeria	(16) L16RE-B Flooded	1
City of Joy Solar Community Center	Grid-tied with Battery Backup	Congo	(40) 31-AGM	2



Industrial Markets

Lighting

Off-grid lighting applications require batteries that can withstand the daily deep battery cycling inherent in solar applications. Trojan's deep-cycle AGM batteries provide long battery life and deliver consistent performance.

Telecom Networks

Remote telecom sites use solar, wind and hybrid systems with Trojan deep-cycle battery backup to power tower equipment.

Banks and ATMs

Trojan batteries, utilized for battery backup, allow banks and ATMs to be operational 24 hours per day.

Security

Security systems in remote locations rely on battery-based solar energy solutions to provide effective coverage, when access to grid power is not available. Trojan deep-cycle batteries enable these systems to operate without interruption in the most remote, rugged or harsh conditions.

Oil and Gas

Oil and natural gas production sites have adopted renewable energy systems with battery backup storage to provide consistent, reliable power for equipment often located in remote areas.

Communications

To enhance response times for critical repositioning of telemetry equipment located in remote locations, stand-alone battery-based solar power systems are implemented to provide a reliable energy storage solution to power this equipment.

BATTERY BANK CONFIGURATION	SYSTEM CAPACITY	CHARGE CONTROLLER/ INVERTER CHARGER	WHY DID THE CUSTOMER CHOOSE TROJAN?
48V 1021Ah	6.6Kwp	Outback Charge Controller	For the market in India, the battery of choice was the Premium Line due to its low cost, longer life and the unique Smart Carbon technology to address Partial State of Charge.
12V 205Ah	150Wp-300Wp	10 amp Morningstar Charge Controller	We brought electricity to 40 homes using one Signature Line battery per each solar home system. Trojan has proved to be a reliable brand for rural electrification projects in Latin America.
3 clusters of 48V 2,722Ah	65Kwp	(9) SMA Sunny Island 5048	Industrial deep-cycle flooded batteries, which offer 17 years of life according to IEC 61427 testing, were chosen over VRLA batteries because of their affordability and long life.
12V 500Ah	245Wp	Phocos Charge Controllers	The extreme weather conditions in the United Arab Emirates required a superior maintenance-free battery with long-life.
48V 740Ah	3.5Kwp	(2) Steca TAROM 4401 / (1) SMA Sunny Island 5048	ATMs must be operational 24/7, and Trojan's Premium Line offers the reliability and warranty required to meet the industry's requirements.
2 clusters of 48V 400Ah	7.2Kwp	(2) SMA Sunny Boy 3800 and (2) SMA Sunny Island 5048	AGM batteries were selected for the grid-backup system due to the higher discharge current and higher charging efficiency.

Deep-Cycle Flooded Batteries

Smart Carbon™



Smart Carbon™

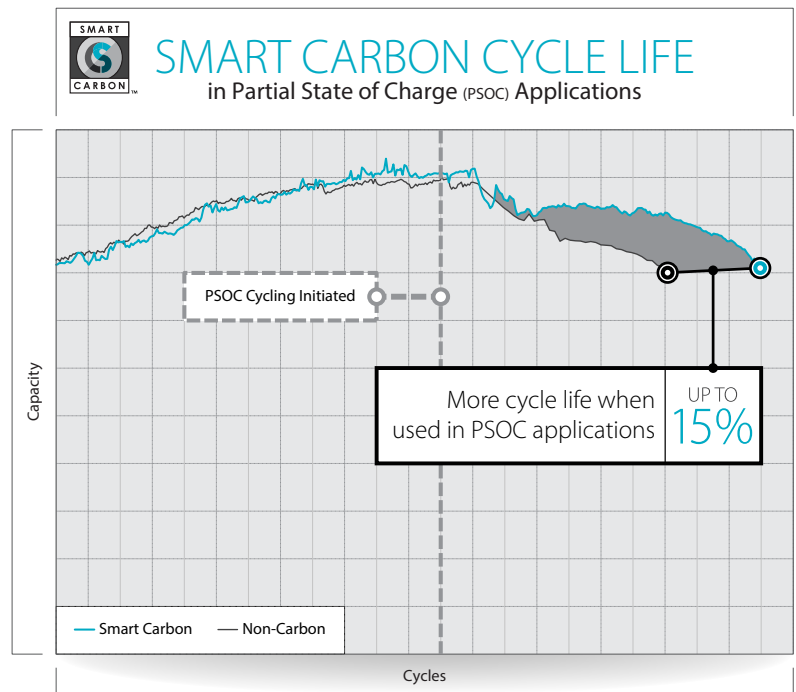
Trojan's Intelligent Solution for Partial State of Charge (PSOC)

Deep-cycle batteries used in off-grid and unstable grid applications are heavily cycled at partial state of charge (PSOC). Operating at PSOC on a regular basis can quickly diminish the overall life of a battery, which results in frequent and costly battery replacements.

To address the impact of PSOC on deep-cycle batteries in renewable energy (RE), inverter backup and telecom applications, Trojan Battery has now included Smart Carbon™ as a standard feature in its Industrial and Premium flooded battery lines.

Based on more than five years of research and development by Trojan's engineering team, Smart Carbon is Trojan's proprietary formula which provides improved performance when the batteries operate in PSOC, enhancing overall battery life in applications where the batteries are undercharged on a regular basis.

Trojan Battery is the first manufacturer to introduce a carbon additive as a standard feature in deep-cycle flooded batteries used in RE, inverter backup and telecom applications.



The inclusion of Smart Carbon to Trojan's Industrial and Premium advanced lead acid lines provides:

- **A decrease in the rate of sulfation in PSOC conditions**
- **Improved charge acceptance**
- **Faster recharge in PSOC applications**
- **High energy efficiency**

The addition of Smart Carbon builds on Trojan's commitment to provide deep-cycle batteries that offer long cycle life, durable design and consistent power day in and day out.

Battery Cycle Life and Testing

Cycle Life Chart

A critical factor to consider when purchasing a deep-cycle battery for a renewable energy application is cycle life. The cycle life rating is the number of discharge/charge cycles the battery can provide over its lifetime. This will allow you to determine the true value of the battery over its life by understanding the total cost of ownership.



IEC 61427 STANDARD

Secondary cells and batteries for renewable energy storage

17
Years

Trojan Battery
Industrial Line

8
Years

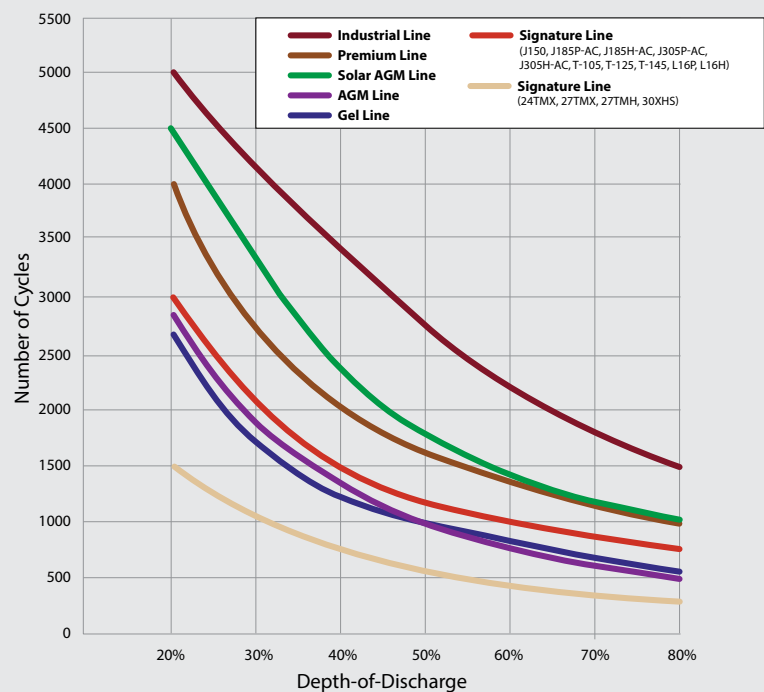
Trojan Battery
Premium Line

8
Years

Trojan Battery
Solar AGM

Importance of Testing PV Batteries to IEC 61427 Standard

Life expectancy of PV batteries has been difficult to quantify – until now. The International Electrotechnical Commission's (IEC) standard 61427 test provides performance criteria that all batteries for PV applications should be measured against. It offers a common, internationally accepted platform to compare and contrast batteries from different manufacturers.



This chart illustrates the cycle life ratings for the Trojan lines of deep-cycle batteries for renewable energy applications.

Advanced Flooded Battery Technology

Smart Carbon™

For enhanced life and improved performance in RE applications operating in PSOC, Trojan's Industrial Line and Premium Line of batteries now feature Smart Carbon. Trojan's proprietary carbon formula, Smart Carbon, increases the electrochemically active surface area which provides improved charge acceptance and faster recharge in applications where the batteries are undercharged on a regular basis.

Alpha Plus® Paste with T2 Technology™

Trojan's Alpha Plus Paste is a proprietary, high-density paste formulation precisely engineered to deliver outstanding battery performance. This high-density paste optimizes porosity development in the active material utilizing the active material more effectively, resulting in sustained battery performance over a longer period of time. Trojan's T2 Technology features a patented T2 metal agent which is incorporated into Trojan's Alpha Plus Paste further strengthening the electrochemical processing capabilities of the paste. Alpha Plus Paste with T2 Technology increases both sustained capacity and total overall ampere-hours resulting in more operating power. It's a key reason why Trojan batteries consistently outperform the competition.

DuraGrid™ Technology

Trojan's DuraGrid Technology is an innovative grid design specifically engineered for the longer life requirements of demanding renewable energy applications. DuraGrid features a thick grid structure which maintains greater corrosion resistance, effectively increasing the life of the battery for up to 10 years. Exclusive to Trojan's Industrial Line and Premium Line is a low-profile grid configuration that is optimized to enhance current flow throughout the grid network. This low-profile design maximizes the amount of electrolyte resulting in longer intervals between watering.

Reinforced Protection Wrap

Trojan's Industrial batteries are engineered with a robust positive plate construction that enhances overall performance. Trojan's DuraGrid technology combined with Alpha Plus paste securely locks the active materials to the grid creating an exceptionally strong positive plate. The Industrial Line includes a five component wrapping and insulating system comprised of a stranded vertical slyver with a 20 mil backing mat and a secondary 20 mil horizontal compression mat. The entire mat is wrapped with edge-protecting Koroseal that is heat bonded as well as bonded to the plastic boot to protect the bottom of the plate while keeping the Koroseal in place. The advanced plate construction protects against shedding and assures the electrochemical performance of the battery's active materials.

Maxguard® XL Separator

Exclusively available in Trojan's Industrial and Premium batteries is the Maxguard XL separator. Featuring a wide-channel design, the Maxguard XL separator increases acid flow for optimum battery performance. Thirty percent thicker than Trojan's standard flooded battery separators, the Maxguard XL provides even greater resistance to stratification which is a typical mode of failure in batteries used in renewable energy systems.

Moss Shield

Trojan's Industrial Line and Premium Line of deep-cycle batteries include a full length moss shield to protect the separators from damage. The moss shield increases the battery life by protecting the top of the plates from shorting to the cell strap.



2,800 Cycles
@ 50% DOD
464-1849 Ah @ C20



1,600 Cycles
@ 50% DOD
225-1110 Ah @ C20



600 – 1,200 Cycles
@ 50% DOD
85-435 Ah @ C20

TECHNOLOGY	INDUSTRIAL	PREMIUM	SIGNATURE
Smart Carbon™	■	■	
Alpha Plus® Paste With T2 Technology™	■	■	■
Duragrid™ Technology	■	■	
Trojan Grid Technology			■
Reinforced Protection Wrap	■		
Maxguard® XL Separator	■	■	
Maxguard® T2 Separator			■
Moss Shield	■	■	
Advanced Lead Acid	■	■	

Trojan's battery testing procedures adhere to both BCI and IEC test standards.

Industrial flooded batteries... designed for 2800 cycles at 50% DOD



Spice Village Resort, India
72 Trojan Deep-Cycle IND29-4V Batteries

The Industrial Line is engineered specifically to support renewable energy systems with large daily loads where the batteries are cycled regularly. These high amp-hour capacity batteries are ideal for use in large off-grid photovoltaic (PV) systems, off-grid hybrid PV systems, grid-tied PV systems with battery backup, smart grid peak shifting systems and a variety of other applications. The Industrial Line is tested to IEC standards and features advanced battery technologies that deliver reliable power. Trojan's Industrial Line is the perfect combination of performance and function.

Key Features

Smart Carbon™
Alpha Plus® Paste with T2 Technology™
DuraGrid™ Technology
Reinforced Protection Wrap
Maxguard® XL Separator
Moss Shield

Intelligent Design

Dual Container Protection

Trojan's Industrial Line of deep-cycle batteries is comprised of one, two or three single 2-volt cells, standalone or bundled together, secured in a secondary containment case to form single, high-capacity 2-volt, 4-volt or 6-volt battery solutions. Components of the individual cells are assembled in a rugged polypropylene housing designed to protect the internal plates from potential damage that may be caused during transport and installation. The 2-volt cells are enclosed in a larger polyethylene outer case that protects against damage caused by harsh environmental conditions such as moisture and dirt buildup, as well as safeguards against potential acid leaks. For added protection the thick-walled case features a lattice-design that reinforces the outer case's structural integrity.

Stability Control

Trojan designed its Industrial Line of batteries with stability in mind. Featuring a lower battery profile and wider stance design, weight is evenly distributed throughout the battery. By creating a wider center of gravity the battery profile enhances overall stability. Molded into the case design are dual handles that enable easy movement during transport and installation.

BCI GROUP SIZE	TYPE	VOLTAGE	CAPACITY ^A Amp-Hours (Ah)				ENERGY (kWh)	Default TERMINAL	DIMENSIONS ^B Inches (mm)			WEIGHT lbs. (kg) ^D
			5-Hr Rate	10-Hr Rate	20-Hr Rate	100-Hr Rate	100-Hr Rate		Length	Width	Height ^C	
INDUSTRIAL LINE - DEEP-CYCLE FLOODED BATTERIES - WITH SMART CARBON™												
N/A	IND9-6V	6 VOLT	365	414	464	601	3.61	14	15.32 (389)	10.24 (260)	23.54 (598)	220 (100)
N/A	IND13-6V	6 VOLT	545	616	695	902	5.41	14	22.36 (568)	10.34 (263)	23.92 (608)	315 (143)
N/A	IND17-6V	6 VOLT	727	820	925	1202	7.21	14	27.21 (691)	10.38 (264)	23.73 (603)	415 (188)
N/A	IND23-4V	4 VOLT	1000	1129	1270	1654	6.62	14	22.33 (561)	10.22 (260)	24.01 (610)	370 (168)
N/A	IND29-4V	4 VOLT	1274	1448	1618	2105	8.42	14	27.10 (688)	10.35 (263)	23.81 (605)	465 (211)
N/A	IND27-2V	2 VOLT	1215	1368	1520	1954	3.91	14	15.28 (388)	10.38 (264)	24.00 (610)	228 (104)
N/A	IND33-2V	2 VOLT	1455	1682	1849	2405	4.81	14	17.33 (440)	10.22 (260)	24.01 (610)	278 (125)

A. The amount of amp-hours (Ah) a battery can deliver when discharged at a constant rate at 80°F (27°C) and maintain a voltage above 1.75 V/cell. Capacities are based on peak performance.
B. Dimensions may vary depending on type of handle or terminal. Batteries to be mounted with .5 inches (12.7 mm) spacing minimum.
C. Dimensions taken from bottom of the battery to the highest point on the battery. Heights may vary depending on type of terminal.
D. Weight may vary.



Premium flooded batteries... designed for 1600 cycles at 50% DOD

Thomonde Hospital, Haiti
48 Trojan Deep-Cycle L16RE-2V Batteries



Renewable energy applications operate under challenging conditions such as fluctuating or extreme temperatures, remote locations and the intermittent nature of solar and wind power generation.

Designed with a 10-year battery life, Trojan Battery's Premium Line of flooded deep-cycle batteries is specifically engineered to withstand the rigorous conditions of renewable energy applications. Our product strategy is focused on one simple objective – manufacture the highest quality battery available in the industry which is why our Premium Line is tested to IEC standards.

- ① **Smart Carbon™**
- ② **Alpha Plus® Paste with T2 Technology™**
- ③ **DuraGrid™ Technology**
- ④ **Maxguard® XL Separator**
- ⑤ **Moss Shield**

BCI GROUP SIZE	TYPE	VOLTAGE	CAPACITY ^A Amp-Hours (Ah)				ENERGY (kWh)	Default TERMINAL	DIMENSIONS ^B Inches (mm)			WEIGHT lbs. (kg) ^B
			5-Hr Rate	10-Hr Rate	20-Hr Rate	100-Hr Rate	100-Hr Rate		Length	Width	Height ^C	
PREMIUM LINE - DEEP-CYCLE FLOODED BATTERIES - WITH SMART CARBON™												
921	J200-RE*	12 VOLT	155	176	200	220	2.64	6	14.97 (380)	6.91 (176)	14.71 (374)	132 (60)
GC2H	T-105 RE	6 VOLT	185	207	225	250	1.50	16	10.30 (262)	7.11 (181)	11.67 (296)	67 (30)
903	L16RE-A*	6 VOLT	267	299	325	360	2.16	5	11.67 (296)	6.95 (177)	17.56 (446)	115 (52)
903	L16RE-B*	6 VOLT	303	340	370	410	2.46	5	11.67 (296)	6.95 (177)	17.56 (446)	118 (54)
903	L16RE-2V*	2 VOLT	909	1021	1110	1235	2.47	5	11.67 (296)	6.95 (177)	17.56 (446)	119 (54)

* Polyon™ Case

^A The amount of amp-hours (Ah) a battery can deliver when discharged at a constant rate at 80°F (27°C) and maintain a voltage above 1.75 V/cell. Capacities are based on peak performance.

^B Dimensions may vary depending on type of handle or terminal. Batteries to be mounted with .5 inches (12.7 mm) spacing minimum.

^C Dimensions taken from bottom of the battery to the highest point on the battery. Heights may vary depending on type of terminal.

^D Weight may vary.

Signature Flooded Line

Classic Trojan featuring... T2 Technology™

The Signature Line of deep-cycle flooded batteries is the flagship of Trojan's product portfolio.

Engineered to provide rugged durability and outstanding performance, Trojan's Signature Line is perfectly suited for use in renewable energy systems where lowest life-cycle cost is the key consideration. An all around power house, the Signature Line features Trojan's historically-proven engineering with T2 Technology, an advanced battery technology for maximum sustained performance, longer life and increased total energy.



- 1 Alpha Plus® Paste with T2 Technology™
- 2 Trojan Grid Technology
- 3 Maxguard® T2 Separator

BCI GROUP SIZE	TYPE	VOLTAGE	CAPACITY ^A Amp-Hours (Ah)				ENERGY (kWh)	Default TERMINAL	DIMENSIONS ^B Inches (mm)			WEIGHT lbs. (kg) ^B
			5-Hr Rate	10-Hr Rate	20-Hr Rate	100-Hr Rate	100-Hr Rate		Length	Width	Height ^C	
SIGNATURE LINE - DEEP-CYCLE FLOODED BATTERIES												
GC12	T-1275	12 VOLT	120	134	150	166	1.99	1	12.96 (329)	7.13 (181)	11.13 (283)	85 (39)
GC12	J150	12 VOLT	120	134	150	166	1.99	2	13.95 (354)	7.13 (181)	11.13 (283)	84 (38)
921	J185P-AC*	12 VOLT	168	189	205	226	2.71	6	14.97 (380)	6.91 (176)	14.67 (373)	114 (52)
921	J185H-AC*	12 VOLT	185	207	225	249	2.99	6	14.97 (380)	6.91 (176)	14.67 (373)	123 (56)
GC2	T-605	6 VOLT	175	193	210	232	1.39	1	10.30 (262)	7.13 (181)	11.15 (283)	58 (26)
GC2	T-105	6 VOLT	185	207	225	250	1.50	1	10.30 (262)	7.13 (181)	11.15 (283)	62 (28)
GC2	T-125	6 VOLT	195	221	240	266	1.60	1	10.30 (262)	7.13 (181)	11.15 (283)	66 (30)
DIN	TE35	6 VOLT	201	225	245	270	1.63	8	9.60 (244)	7.50 (191)	10.60 (269)	68 (31)
GC2H	T-145	6 VOLT	215	239	260	287	1.72	1	10.30 (262)	7.11 (181)	11.90 (302)	72 (33)
902	J305P-AC*	6 VOLT	271	304	330	367	2.20	6	11.66 (296)	6.94 (176)	14.42 (366)	96 (44)
902	J305H-AC*	6 VOLT	295	331	360	400	2.40	6	11.66 (296)	6.94 (176)	14.42 (366)	98 (45)
903	L16P*	6 VOLT	344	386	420	467	2.80	5	11.66 (296)	6.94 (176)	17.55 (446)	114 (52)
903	L16P-AC*	6 VOLT	344	386	420	467	2.80	6	11.66 (296)	6.94 (176)	16.74 (425)	114 (52)
903	L16H*	6 VOLT	357	400	435	483	2.89	5	11.66 (296)	6.94 (176)	17.55 (446)	125 (57)
903	L16H-AC*	6 VOLT	357	400	435	483	2.89	6	11.66 (296)	6.94 (176)	16.74 (425)	125 (57)
SIGNATURE LINE - DEEP-CYCLE FLOODED BATTERIES												
24	24TMX	12 VOLT	70	78	85	94	1.13	9	10.92 (277)	6.62 (168)	9.25 (235)	47 (21)
27	27TMX	12 VOLT	85	97	105	117	1.40	9	12.84 (326)	6.60 (168)	9.74 (247)	55 (25)
27	27TMH	12 VOLT	95	106	115	128	1.54	9	12.84 (326)	6.60 (168)	9.74 (247)	61 (28)
30H	30XHS	12 VOLT	105	120	130	144	1.73	9	13.94 (354)	6.75 (171)	10.09 (256)	66 (30)

* Polyon™ Case

A. The amount of amp-hours (Ah) a battery can deliver when discharged at a constant rate at 80°F (27°C) and maintain a voltage above 1.75 V/cell. Capacities are based on peak performance.
 B. Dimensions may vary depending on type of handle or terminal. Batteries to be mounted with .5 inches (12.7 mm) spacing minimum.
 C. Dimensions taken from bottom of the battery to the highest point on the battery. Heights may vary depending on type of terminal.
 D. Weight may vary.

Introducing SOLAR TRUE DEEP-CYCLE AGM



Trojan has incorporated several key engineering features in its Solar AGM batteries for renewable energy, hybrid and backup power applications that require deep-cycling power in a non-spillable battery design.

Engineered for best value and worry-free storage, Trojan Solar AGM maintenance-free batteries can be counted on day in and day out as a reliable power source for a wide range of off-grid and unreliable grid applications, including:

- Remote micro-grids
- Solar home systems
- Solar street signs/lights
- Residential & commercial backup
- Off-grid cabins/tiny house
- Telecom
- Oil & gas

Trojan's proven quality and reliability is the result of our extensive engineering expertise in deep-cycle battery design. Our Solar AGM batteries feature:

- Rugged Polypropylene case
- Optimized paste formula for solar applications
- Reinforced cell compression for optimum performance
- Flame arrestors for safety
- Premium absorbed glass mat separators for maximum performance
- Top-facing or front-facing terminals for easy installation

These combined elements deliver increased total energy output, maximized sustained performance, consistent quality, and enhanced durability. The Trojan Solar AGM batteries are produced at its U.S.-based manufacturing operations which employs the latest technology, testing and quality check standards in the industry.



MODEL NAME	CAPACITY ^A Amp-Hours (Ah)					ENERGY (kWh) 20-Hr Rate	TERMINAL Type	DIMENSIONS ^B INCHES (mm)			WEIGHT lbs. (kg) ^D	Handles	Installation Orientation
	RATE							Length	Width	Height ^C			
	10-Hr	20-Hr	48-Hr	72-Hr	100-Hr								
12 VOLT DEEP-CYCLE SOLAR AGM BATTERIES													
SAGM 12 135	131	135	136	137	137	1.62	M8/LT Adapter	12.96 (329)	7.06 (179)	10.96 (278)	81 (37)	Embedded	Horizontal and Vertical
SAGM 12 205	174	205	210	213	216	2.46	M8/LT Adapter	14.97 (380)	6.94 (176)	14.07 (357)	125 (57)	Braided Rope	Horizontal and Vertical
8 VOLT DEEP-CYCLE SOLAR AGM BATTERIES													
SAGM 08 165	145	165	168	171	174	1.32	M8/LT Adapter	10.30 (262)	7.06 (179)	10.73 (273)	70 (32)	Embedded	Horizontal and Vertical
6 VOLT DEEP-CYCLE SOLAR AGM BATTERIES													
SAGM 06 220	190	220	228	231	235	1.33	M8/LT Adapter	10.30 (262)	7.06 (179)	10.73 (273)	68 (31)	Embedded	Horizontal and Vertical
SAGM 06 315	278	315	326	331	335	1.89	M8/LT Adapter	11.66 (296)	6.94 (176)	13.99 (355)	95 (43)	Braided Rope	Horizontal and Vertical
SAGM 06 375	329	375	389	394	400	2.25	M8/LT Adapter	11.66 (296)	6.94 (176)	16.31 (414)	115 (52)	Braided Rope	Horizontal and Vertical

A. The amount of amp-hours (Ah) a battery can deliver when discharged at a constant rate of 86°F (30°C) for all rates and maintain a voltage above 1.75 V/cell. Capacities are based on peak performance.

B. Dimensions may vary depending on type of handle or terminal. Batteries should be mounted with 0.5 inches (12.7 mm) spacing minimum.

C. Height taken from bottom of the battery to the highest point on the battery. Heights may vary depending on type of terminal.

D. Weight may vary.

Trojan's battery testing procedures adhere to both BCI and IEC test standards.



Deep-Cycle AGM Line

Trojan's deep-cycle absorbed glass mat (AGM) maintenance-free batteries for renewable energy applications feature a number of design elements to provide optimum performance. Robust plates extend the life-cycle of Trojan's deep-cycle AGM batteries. A separator of glass fibers serves to isolate the positive and negative plates while acting as a blotter to absorb the electrolyte. The separator is maintained under compression between plates to assure contact with plate surfaces. A computer-generated grid design is optimized for high-power density. Low calcium grid alloy reduces gas emissions and a flame arresting, one-way pressure relief vent prevents buildup of excessive pressure. Trojan's deep-cycle AGM batteries are low temperature tolerant, shock and vibration resistant and have a low internal resistance for higher discharge current and higher charging efficiency.



Deep-Cycle Gel Line

Trojan's deep-cycle gel batteries are sealed, maintenance-free batteries that deliver superior power in demanding renewable energy applications. Engineered for rugged durability, outstanding performance and long battery life, Trojan's deep-cycle gel batteries feature a number of important design characteristics that provide significant advantages over competing gel products. The gelled electrolyte is a proprietary formulation containing sulfuric acid, fumed silica, pure demineralized, deionized water and a phosphoric acid additive. This exclusive formulation produces a homogenous gel that delivers consistent performance and dramatically long cycle life. The heavy-duty grids lock active material onto the grid network to efficiently deliver more concentrated energy to the terminals. Premium grade, double-insulated separators allow maximum charge flow between the plates for optimum performance.

BCI GROUP SIZE	TYPE	VOLTAGE	CAPACITY ^A Amp-Hours (Ah)				ENERGY (kWh) 100-Hr Rate	Default TERMINAL	DIMENSIONS ^B Inches (mm)			WEIGHT lbs. (kg) ^D
			5-Hr Rate	10-Hr Rate	20-Hr Rate	100-Hr Rate			Length	Width	Height ^C	
DEEP-CYCLE AGM BATTERIES												
U1	U1-AGM	12 VOLT	29	31	33	34	0.41	15	7.78 (198)	5.20 (132)	6.75 (171)	27 (12)
22	22-AGM	12 VOLT	43	47	50	52	0.62	15	8.96 (228)	5.49 (139)	8.04 (204)	40 (18)
24	24-AGM	12 VOLT	67	70	76	84	1.01	6	10.77 (274)	6.84 (174)	8.62 (219)	54 (24)
27	27-AGM	12 VOLT	77	82	89	99	1.19	6	12.05 (306)	6.84 (174)	9.32 (237)	64 (29)
31	31-AGM	12 VOLT	82	92	100	111	1.33	6	13.42 (341)	6.81 (173)	9.18 (233)	69 (31)
GC12	12-AGM	12 VOLT	112	127	140	144	1.72	15	13.54 (344)	6.76 (172)	10.88 (276)	100 (45)
DEEP-CYCLE GEL BATTERIES												
24	24-GEL	12 VOLT	66	72	77	85	1.02	6	10.92 (277)	6.61 (168)	9.26 (235)	52 (24)
27	27-GEL	12 VOLT	76	84	91	100	1.20	7	12.73 (323)	6.38 (162)	9.26 (235)	62 (28)
31	31-GEL	12 VOLT	85	94	102	108	1.30	7	12.94 (329)	6.82 (173)	9.64 (245)	70 (32)
DIN	5SHP-GEL	12 VOLT	110	115	125	137	1.64	8	13.58 (345)	6.75 (172)	11.01 (280)	85 (39)
8D	8D-GEL	12 VOLT	188	207	225	265	3.18	5	20.69 (526)	10.95 (278)	10.82 (275)	168 (76)
GC2	6V-GEL	6 VOLT	154	167	189	198	1.19	6	10.25 (260)	7.08 (180)	10.82 (275)	68 (31)
DIN	TE35-GEL	6 VOLT	180	193	210	220	1.32	8	9.64 (245)	7.51 (191)	10.65 (271)	69 (31)

A. The amount of amp-hours (Ah) a battery can deliver when discharged at a constant rate at 80°F (27°C) and maintain a voltage above 1.75 V/cell. Capacities are based on peak performance.

B. Dimensions may vary depending on type of handle or terminal. Batteries to be mounted with .5 inches (12.7 mm) spacing minimum.

C. Dimensions taken from bottom of the battery to the highest point on the battery. Heights may vary depending on type of terminal.

D. Weight may vary.

Battery Watering and Terminal Options

Battery Watering Made Easy

(Flooded Batteries Only)

The Single-Point Watering Kit simplifies battery watering, maximizing performance and life of Trojan's deep-cycle flooded batteries. The Single-Point Battery Watering Kit comes in three configurations: 12V, 24V and 48V. The kits are designed for single string installations with Trojan Premium, Industrial and Signature Line flooded batteries**. For systems with multiple strings in parallel, simply order multiple kits at the required system voltage.



Flexible Design

The Single-Point Watering Kit is designed to work with flooded deep-cycle batteries and takes the guess work out of properly watering flooded batteries. The flexible tube routing allows the watering system to work with various battery bank sizes and configurations.

Automatics Shut-Off Valves

The Single-Point Watering Kit includes automatic shut-off valves, interconnected with tubing, that replace the existing vent caps. A quick coupling allows the system to be connected to a water supply. Once the watering system is installed, water flows into each battery cell until it reaches the correct level. A flow indicator built into the water supply tells the operator when filling has been completed. The entire process generally takes just 30 seconds per battery.

Extend Battery Life and Performance

A properly watered battery lasts longer and performs better. Overfilling a battery can result in loss of acid, while charging with low electrolyte levels can result in permanent damage to the lead plates. Both can result in loss of capacity and life expectancy.

Safety

The Single-Point Watering Kit allows you to fill deep-cycle batteries without having to remove the vent covers. The use of a watering kit, avoids battery acid burns, ruined clothing and noxious fumes.

** The Single-Point Watering Kit is compatible with all Trojan Industrial, Premium, and Signature Line flooded batteries except models 24TMX, 27TMX, 27TMH and 30XH5.

Terminal Configurations



1 - ELPT
Embedded Low
Profile



2 - EHPT
Embedded High
Profile



5 - LT
L-Terminal



6 - DT
Automotive Post & Stud



7 - UT
Universal



8 - AP
Automotive Post



9 - WNT
Wingnut



14 - IND
Ind



15 - M6/M8
6mm/8mm Insert



16 - SLT
Small L-Terminal

* Polygon™ Case



- A. The amount of amp-hours (Ah) a battery can deliver when discharged at a constant rate at 80°F (27°C) and maintain a voltage above 1.75 V/cell. Solar AGM line: the amount of amp-hours (Ah) a battery can deliver when discharged at a constant rate of 86°F (30°C) for all rates and maintain a voltage above 1.75 V/cell. Capacities are based on peak performance.
B. Dimensions may vary depending on type of handle or terminal. Batteries to be mounted with .5 inches (12.7 mm) spacing minimum.
C. Dimensions taken from bottom of the battery to the highest point on the battery. Heights may vary depending on type of terminal.
D. Weight may vary.

■ TE35-GEL and 5SHP-GEL are not UN2800 certified

Product Specification Guide

BCI GROUP SIZE	TYPE	VOLTAGE	CAPACITY ^A Amp-Hours (Ah)				ENERGY (kWh)		Default TERMINAL	DIMENSIONS ^B Inches (mm)			WEIGHT lbs. (kg) ^D
			5-Hr Rate	10-Hr Rate	20-Hr Rate	100-Hr Rate	100-Hr Rate	Length		Width	Height ^C		
INDUSTRIAL LINE - DEEP-CYCLE FLOODED BATTERIES - WITH SMART CARBON™													
N/A	IND9-6V	6 VOLT	365	414	464	601	3.61	14	15.32 (389)	10.24 (260)	23.54 (598)	220 (100)	
N/A	IND13-6V	6 VOLT	545	616	695	902	5.41	14	22.36 (568)	10.34 (263)	23.92 (608)	315 (143)	
N/A	IND17-6V	6 VOLT	727	820	925	1202	7.21	14	27.21 (691)	10.38 (264)	23.73 (603)	415 (188)	
N/A	IND23-4V	4 VOLT	1000	1129	1270	1654	6.62	14	22.33 (567)	10.22 (260)	24.01 (610)	370 (168)	
N/A	IND29-4V	4 VOLT	1274	1448	1618	2105	8.42	14	27.10 (688)	10.35 (263)	23.81 (605)	465 (211)	
N/A	IND27-2V	2 VOLT	1215	1368	1520	1954	3.91	14	15.28 (388)	10.38 (264)	24.00 (610)	228 (104)	
N/A	IND33-2V	2 VOLT	1455	1682	1849	2405	4.81	14	17.33 (440)	10.22 (260)	24.01 (610)	278 (125)	
PREMIUM LINE - DEEP-CYCLE FLOODED BATTERIES - WITH SMART CARBON™													
921	J200-RE*	12 VOLT	155	176	200	220	2.64	6	14.97 (380)	6.91 (176)	14.71 (374)	132 (60)	
GC2H	T-105 RE	6 VOLT	185	207	225	250	1.50	16	10.30 (262)	7.11 (181)	11.67 (296)	67 (30)	
903	L16RE-A*	6 VOLT	267	299	325	360	2.16	5	11.67 (296)	6.95 (177)	17.56 (446)	115 (52)	
903	L16RE-B*	6 VOLT	303	340	370	410	2.46	5	11.67 (296)	6.95 (177)	17.56 (446)	118 (54)	
903	L16RE-2V*	2 VOLT	909	1021	1110	1235	2.47	5	11.67 (296)	6.95 (177)	17.56 (446)	119 (54)	
SIGNATURE LINE - DEEP-CYCLE FLOODED BATTERIES													
GC12	T-1275	12 VOLT	120	134	150	166	1.99	1	12.96 (329)	7.13 (181)	11.13 (283)	85 (39)	
GC12	J150	12 VOLT	120	134	150	166	1.99	2	13.95 (354)	7.13 (181)	11.13 (283)	84 (38)	
921	J185P-AC*	12 VOLT	168	189	205	226	2.71	6	14.97 (380)	6.91 (176)	14.67 (373)	114 (52)	
921	J185H-AC*	12 VOLT	185	207	225	249	2.99	6	14.97 (380)	6.91 (176)	14.67 (373)	123 (56)	
GC2	T-605	6 VOLT	175	193	210	232	1.39	1	10.30 (262)	7.13 (181)	11.15 (283)	58 (26)	
GC2	T-105	6 VOLT	185	207	225	250	1.50	1	10.30 (262)	7.13 (181)	11.15 (283)	62 (28)	
GC2	T-125	6 VOLT	195	221	240	266	1.60	1	10.30 (262)	7.13 (181)	11.15 (283)	66 (30)	
DIN	TE35	6 VOLT	201	225	245	270	1.63	8	9.60 (244)	7.50 (191)	10.60 (269)	68 (31)	
GC2H	T-145	6 VOLT	215	239	260	287	1.72	1	10.30 (262)	7.11 (181)	11.90 (302)	72 (33)	
902	J305P-AC*	6 VOLT	271	304	330	367	2.20	6	11.66 (296)	6.94 (176)	14.42 (366)	96 (44)	
902	J305H-AC*	6 VOLT	295	331	360	400	2.40	6	11.66 (296)	6.94 (176)	14.42 (366)	98 (45)	
903	L16P*	6 VOLT	344	386	420	467	2.80	5	11.66 (296)	6.94 (176)	17.55 (446)	114 (52)	
903	L16P-AC*	6 VOLT	344	386	420	467	2.80	6	11.66 (296)	6.94 (176)	16.74 (425)	114 (52)	
903	L16H*	6 VOLT	357	400	435	483	2.89	5	11.66 (296)	6.94 (176)	17.55 (446)	125 (57)	
903	L16H-AC*	6 VOLT	357	400	435	483	2.89	6	11.66 (296)	6.94 (176)	16.74 (425)	125 (57)	
SIGNATURE LINE - DEEP-CYCLE FLOODED BATTERIES													
24	24TMX	12 VOLT	70	78	85	94	1.13	9	10.92 (277)	6.62 (168)	9.25 (235)	47 (21)	
27	27TMX	12 VOLT	85	97	105	117	1.40	9	12.84 (326)	6.60 (168)	9.74 (247)	55 (25)	
27	27TMH	12 VOLT	95	106	115	128	1.54	9	12.84 (326)	6.60 (168)	9.74 (247)	61 (28)	
30H	30XHS	12 VOLT	105	120	130	144	1.73	9	13.94 (354)	6.75 (171)	10.09 (256)	66 (30)	
SOLAR AGM DEEP CYCLE BATTERIES													
-	SAGM 12 135	12 VOLT	114	131	135	137	—	5, 15	12.96 (329)	7.06 (179)	10.96 (278)	81 (37)	
-	SAGM 12 205	12 VOLT	160	174	205	216	—	5, 15	14.97 (380)	6.94 (176)	14.07 (357)	125 (57)	
-	SAGM 08 165	8 VOLT	132	145	165	174	—	5, 15	10.30 (262)	7.06 (179)	10.73 (273)	70 (32)	
-	SAGM 06 220	6 VOLT	174	190	220	235	—	5, 15	10.30 (262)	7.06 (179)	10.73 (273)	68 (31)	
-	SAGM 06 315	6 VOLT	255	278	315	335	—	5, 15	11.66 (296)	6.94 (176)	13.99 (355)	95 (43)	
-	SAGM 06 375	6 VOLT	295	329	375	400	—	5, 15	11.66 (296)	6.94 (176)	16.31 (414)	115 (52)	
DEEP-CYCLE AGM BATTERIES													
U1	U1-AGM	12 VOLT	29	31	33	34	0.41	15	7.78 (198)	5.20 (132)	6.75 (171)	27 (12)	
22	22-AGM	12 VOLT	43	47	50	52	0.62	15	8.96 (228)	5.49 (139)	8.04 (204)	40 (18)	
24	24-AGM	12 VOLT	67	70	76	84	1.01	6	10.77 (274)	6.84 (174)	8.62 (219)	54 (24)	
27	27-AGM	12 VOLT	77	82	89	99	1.19	6	12.05 (306)	6.84 (174)	9.32 (237)	64 (29)	
31	31-AGM	12 VOLT	82	92	100	111	1.33	6	13.42 (341)	6.81 (173)	9.18 (233)	69 (31)	
GC12	12-AGM	12 VOLT	112	127	140	144	1.72	15	13.54 (344)	6.76 (172)	10.88 (276)	100 (45)	
DEEP-CYCLE GEL BATTERIES													
24	24-GEL	12 VOLT	66	72	77	85	1.02	6	10.92 (277)	6.61 (168)	9.26 (235)	52 (24)	
27	27-GEL	12 VOLT	76	84	91	100	1.20	7	12.73 (323)	6.38 (162)	9.26 (235)	62 (28)	
31	31-GEL	12 VOLT	85	94	102	108	1.30	7	12.94 (329)	6.82 (173)	9.64 (245)	70 (32)	
DIN	5SHP-GEL	12 VOLT	110	115	125	137	1.64	8	13.58 (345)	6.75 (172)	11.01 (280)	85 (39)	
8D	8D-GEL	12 VOLT	188	207	225	265	3.18	5	20.69 (526)	10.95 (278)	10.82 (275)	168 (76)	
GC2	6V-GEL	6 VOLT	154	167	189	198	1.19	6	10.25 (260)	7.08 (180)	10.82 (275)	68 (31)	
DIN	TE35-GEL	6 VOLT	180	193	210	220	1.32	8	9.64 (245)	7.51 (191)	10.65 (271)	69 (31)	



Configure your Renewable Energy System with Trojan Batteries using the Online Renewable Energy Battery Sizing Calculator

Trojan's battery sizing calculator is an easier way to determine battery capacity than manually calculating load requirements and then converting them to battery capacity. Customers simply fill in the appropriate information on the electronic form such as battery voltage, desired depth-of-discharge (DOD), days of autonomy, AC and DC loads, device types with power ratings, and hours per day or days per week used, and the application automatically determines the required battery capacity. It then recommends the Trojan battery models for their particular application. The calculator also allows customers to run "what if" scenarios to find specific battery options to meet their budget or configuration requirements.

This valuable sizing tool is available online at www.batterysizingcalculator.com.

Environmental Stewardship

At Trojan Battery, when we say, "Clean energy for life™," we mean every word. As proactive supporters of environmental sustainability, our environmental stewardship focuses on clean energy initiatives and recycling programs.

- Trojan batteries are 99% recyclable. The container plastic, battery lead and electrolyte from old deep-cycle batteries can be recycled to produce new deep-cycle batteries.
- Through its partnership with Southern California Edison (SCE) Trojan saves more than 8 million kilowatt hours and cuts CO2 emissions by over 12 million pounds significantly reducing our annual energy consumption and carbon foot print.



**TROJAN BATTERY
COMPANY WITH
QUALITY SYSTEM
CERTIFIED BY DNV
= ISO 9001:2008 =**



Trojan batteries are available worldwide. We offer outstanding technical support, provided by full-time application engineers.

Call 800.423.6569 or + 1.562.236.3000 or visit www.trojanbattery.com
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