RE ENERGY STORAGE SOLUTIONS

for Renewable Energy / Hybrid Systems / Backup Power









NAME AND A



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 Solar Industrial and Solar 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 deepcycle AGM battery. Trojan's Solar AGM is uniquely engineered for a wide range of applications 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 *Transitioned to Solar Premium SPRE 06 415	11
Isla Bella Vista - Solar Home Systems (SHS)	Rural Electrification	Ecuador	(1) J185P-AC* Flooded *Transitioned to Solar Signature SSIG 12 230	40
Spice Village Resort	Off-Grid Solar Eco-Resort	India	(72) IND29-4V* Flooded *Transitioned to Solar Industrial SIND 04 2145	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 *Transitioned to Solar Premium SPRE 06 415	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 Solar 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	6.6Кwp	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 proven to be a reliable brand for rural electrification projects in Latin America.
- 472	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.



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 Solar Industrial and Solar 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 Solar Industrial and Solar 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 deepcycle 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.

Solar Industrial Flooded

Solar Premium Flooded

1.900 Cycles

@ 50% DOD

Flooded

Solar Signature

Solar AGM Deep-Cycle AGM Deep-Cycle Gel





3.600 Cycles

@ 50% DOD











600 - 1.200 Cycles @ 50% DOD

1.700 Cvcles 1.000 Cycles @ 50% DOD @ 50% DOD 135-375 Ah @ C20 33-370 Ah @ C20

1.000 Cycles @ 50% DOD 77-225 Ah @ C20



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 Solar Industrial Line and Solar 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 Solar Industrial Line and Solar 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 Solar 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 Solar 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 Solar Industrial and Solar 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 Solar Industrial Line and Solar 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.



3,600 Cycles @ 50% DOD 610-2450 Ah @ C100







600 – 1,200 Cycles @ 50% DOD 95-490 Ah @ C100

TECHNOLOGY	SOLAR INDUSTRIAL	SOLAR PREMIUM	SOLAR 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.

Solar Industrial flooded batteries... designed for 3,600 cycles at 50% DOD



The Solar 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 Solar Industrial Line is tested to IEC stardards and features advanced battery technologies that deliver reliable power. Trojan's Solar 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 Solar 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 Solar 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.

	VOLTAGE		CAPACI	TY ^A Amp-Ho	urs (Ah)		ENERGY (kWh)	Default	DIMEN	ISIONS [®] Inches	s (mm)	WEIGHT lbs.	HydroLink [™] or
MUDEL NAME		10-Hr Rate	20-Hr Rate	48-Hr Rate	72-Hr Rate	100-Hr Rate	100-Hr Rate	TERMINAL	Length	Width	Height ^c	(kg) ^D	Watering Kit
	SOLAF		RIAL LINE	- DEEP-C	YCLE FLO	ODED BA	TTERIES - V	VITH SMA	ART CARBO	ON™ - 3,600	CYCLES @	50% DOD	
SIND 06 610	6 VOLT	421	472	540	578	610	3.66	14	15.33 (389)	10.22 (260)	24.01 (610)	220 (100)	Single-Point
SIND 06 920	6 VOLT	627	708	813	870	920	5.52	14	22.34 (567)	10.30 (262)	24.01 (610)	315 (143)	Single-Point
SIND 06 1225	6 VOLT	835	942	1083	1159	1225	7.35	14	27.13 (689)	10.44 (265)	24.01 (610)	415 (188)	Single-Point
SIND 04 1685	4 VOLT	1149	1293	1489	1594	1685	6.74	14	22.34 (567)	10.30 (262)	24.01 (610)	367 (167)	Single-Point
SIND 04 2145	4 VOLT	1474	1647	1896	2030	2145	8.58	14	27.22 (691)	10.44 (265)	24.01 (610)	465 (211)	Single-Point
SIND 02 1990	2 VOLT	1393	1547	1771	1889	1990	3.98	14	15.33 (389)	10.22 (260)	24.01 (610)	235 (107)	Single-Point
SIND 02 2450	2 VOLT	1712	1882	2166	2318	2450	4.90	14	17.33 (440)	10.22 (260)	24.01 (610)	278 (125)	Single-Point

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

Solar Premium flooded batteries... designed for 1,900 cycles at 50% DOD



SMART

CARBON

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.

Trojan Battery's Solar 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 Solar Premium Line is tested to IEC standards.

- Image: Second Secon
- 2 Alpha Plus[®] Paste with T2 Technology[™]
- OuraGrid[™] Technology
- Maxguard[®] XL Separator
- Moss Shield





IEC 61427

	VOLTAGE		CAPACI	TY ^A Amp-Ho	urs (Ah)		ENERGY (kWh) Default	Default	DIME	NSIONS ^B Inches	(mm)	WEIGHT lbs. (kg) ^D	HydroLink [™] or
MODEL NAME	VULIAGE	10-Hr Rate	20-Hr Rate	48-Hr Rate	72-Hr Rate	100-Hr Rate	100-Hr Rate	TERMINAL	Length	Width	Height ^c		Single-Point Watering Kit
	S	OLAR PRE	EMIUM LI	NE - DEEF	P-CYCLE	FLOODED	BATTERIES	- WITH SM	ART CARBOI	N™ - 1,900 C`	YCLES @ 50%	% DOD	
SPRE 12 225*	12 VOLT	179	204	212	216	225	2.70	6	14.97 (380)	6.91 (176)	14.71 (374)	132 (60)	Single-Point
SPRE 06 255	6 VOLT	211	229	244	249	255	1.53	16	10.30 (262)	7.13 (181)	11.74 (298)	67 (30)	Single-Point
SPRE 06 415*	6 VOLT	346	377	401	410	415	2.50	5	11.66 (296)	6.94 (176)	17.55 (446)	118 (54)	Single-Point
SPRE 02 1255*	2 VOLT	1039	1130	1203	1232	1255	2.51	5	11.66 (296)	6.94 (176)	17.55 (446)	119 (54)	Single-Point

* Polvon™ Case

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

Solar Signature Flooded Line

Engineered to provide rugged durability and outstanding performance, Trojan's Solar 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 Solar Signature Line features Trojan's historicallyproven engineering with T2 Technology, an advanced battery technology for maximum sustained performance, longer life and increased total energy.





- Alpha Plus[®] Paste with T2 Technology[™]
- Trojan Grid Technology
- Maxguard[®] T2 Separator

MODEL NAME	VOLTAGE	CAPACITY ^A Amp-Hours (Ah)						Default	DIME	NSIONS ^B Inches	WEIGHT lbs.	HydroLink™ or Single-Point	
		10-Hr Rate	20-Hr Rate	48-Hr Rate	72-Hr Rate	100-Hr Rate	100-Hr Rate	IERMINAL	Length	Width	Height ^c	(kg) *	Watering Kit
			SOLARS	SIGNATUR	E LINE - D	EEP-CYCLI	E FLOODEI	O BATTER	IES - 1,200 C	YCLES @ 50%	DOD		
SSIG 12 170	12 VOLT	136	153	157	164	170	2.04	2	13.95 (354)	7.13 (181)	10.71 (272)	84 (38)	HydroLink
SSIG 12 230*	12 VOLT	192	209	214	223	230	2.76	6	14.97 (380)	6.91 (176)	14.67 (373)	114 (52)	Single-Point
SSIG 12 255*	12 VOLT	211	229	237	247	255	3.06	6	14.97 (380)	6.91 (176)	14.67 (373)	123 (56)	Single-Point
SSIG 06 235	6 VOLT	196	214	220	228	235	1.42	1	10.30 (262)	7.13 (181)	10.74 (273)	58 (26)	HydroLink
SSIG 06 255	6 VOLT	211	229	237	247	255	1.53	1	10.30 (262)	7.13 (181)	10.74 (273)	62 (28)	HydroLink
SSIG 06 290	6 VOLT	243	265	271	281	290	1.74	1	10.30 (262)	7.13 (181)	11.48 (292)	72 (33)	HydroLink
SSIG 06 375*	6 VOLT	309	336	348	363	375	2.25	6	11.66 (296)	6.94 (176)	14.37 (365)	96 (44)	Single-Point
SSIG 06 405*	6 VOLT	337	366	376	392	405	2.43	6	11.66 (296)	6.94 (176)	14.37 (365)	98 (44)	Single-Point
SSIG 06 475*	6 VOLT	393	428	441	459	475	2.85	5	11.66 (296)	6.94 (176)	17.55 (446)	114 (52)	Single-Point
SSIG 06 490*	6 VOLT	407	443	455	474	490	2.94	5	11.66 (296)	6.94 (176)	17.55 (446)	125 (57)	Single-Point
	SOLAR SIGNATURE LINE - DEEP-CYCLE FLOODED BAT									CLES @ 50%	DOD		
SSIG 12 95	12 VOLT	79	87	88	92	95	1.14	7	10.92 (277)	6.62 (168)	9.25 (235)	47 (21)	N/A
SSIG 12 120	12 VOLT	99	107	111	116	120	1.44	9	12.84 (326)	6.60 (168)	9.74 (247)	55 (25)	N/A
SSIG 12 145	12 VOLT	122	132	135	140	145	1.74	9	13.94 (354)	6.75 (171)	10.09 (256)	66 (30)	N/A

* Polyon™ Case

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

D.



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
- 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.



		CAPACITY A Amp-Hours (Ah)					ENERGY	D.C. k	DIMEN	ISIONS ^B INCHES	5 (mm)			Installation	
MODEL NAME	VOLTAGE	RATE					(kWh)	Default				WEIGHT Ibs. (ka) ^D	Handles	Orientation	
		10-Hr	20-Hr	48-Hr	72-Hr	100-Hr	20-Hr Kate		Length	Width	Height ^c	(
	SOLAR AGM LINE - DEEP-CYCLE AGM BATTERIES - 1,700 CYCLES @ 50% DOD														
SAGM 12 135	12 VOLT	131	135	136	137	137	1.62	M8/LT Adapter	12.96 (329)	7.06 (179)	10.96 (278)	83 (38)	Embedded	Horizontal and Vertical	
SAGM 12 205	12 VOLT	174	205	210	213	216	2.46	M8/LT Adapter	14.97 (380)	6.94 (176)	14.07 (357)	131 (59)	Braided Rope	Horizontal and Vertical	
SAGM 08 165	8 VOLT	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	
SAGM 06 220	6 VOLT	190	220	228	231	235	1.32	M8/LT Adapter	10.30 (262)	7.06 (179)	10.73 (273)	68 (31)	Embedded	Horizontal and Vertical	
SAGM 06 315	6 VOLT	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	6 VOLT	329	375	389	394	400	2.25	M8/LT Adapter	11.66 (296)	6.94 (176)	16.31 (414)	114 (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 minim 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 computergenerated 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 heavyduty 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	MODEL NAME			CAPACITY ^A Ar	np-Hours (Ah)		ENERGY (kWh)	Default	DIME	NSIONS ^B Inches	(mm)	WEIGHT lbs. (kg) ^D
GROUP SIZE		VOLTAGE	5-Hr Rate	10-Hr Rate	20-Hr Rate	100-Hr Rate	100-Hr Rate	TERMINAL	Length	Width	Height ^c	
				DEEP-	CYCLE AGM E	BATTERIES - 1	,000 CYCLES	@ 50% DOD				
U1	U1-AGM	12 VOLT	29	31	33	34	0.41	15	7.78 (198)	5.20 (132)	6.75 (171)	27 (12)
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 B	ATTERIES - 1	,000 CYCLES @	2 50% DOD				
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)
GC8	8V-GEL	8 VOLT	114	127	140	160	1.28	6	10.31 (262)	7.13 (181)	10.88 (276)	70 (32)
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)

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.

The anioun to an periods (wit) a backety call center when tack large of a constant rate at 60° (27) and frammant avonge above Dimensions may vary depending on type of handle or terminal. Batteries to be mounted with 5 inches (12, 7 mil) spacing minimum Dimensions taken from bottom of the battery to the highest point on the battery. Heights may vary depending on type of terminal. 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 Solar Industrial, Solar Premium and Solar 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 Solar Industrial, Solar Premium, and Solar Signature Line flooded batteries except models SSIG 12 95, SSIG 12 120 and SSIG 12 145.

Terminal Configurations



Profile

Automotive Post



Embedded High



9 - WNT

Wingnut

Profile



5-IT

I -Terminal

Ind

6 - DT Automotive Post & Stud



15 - M6/M8 6mm/8mm Insert



7 - UT



Small L-Terminal

RE Product Specification Guide

		CAPACITY Amp-Hours (A		ırs (Ah)		ENERGY ^F (kWh)		DIN	MENSIONS ^B Inches (r	nm)		
MODEL NAME	VOLTAGE	10-Hr Rate	20-Hr Rate	48 -Hr Rate	72 -Hr Rate	100-Hr Rate	100-Hr Rate	Default TERMINAL	Length	Width	Height ^c	WEIGHT lbs. (kg) ^D
	SOLAR IN	DUSTRIAL	LINE - D	EEP-CYCL	E FLOODI	ED BATTE	RIES - WITH	SMART CAR	RBON™ - 3,60	0 CYCLES @ 5	0% DOD	
SIND 06 610	6 VOLT	421	472	540	578	610	3.66	14	15.33 (389)	10.22 (260)	24.01 (610)	220 (100)
SIND 06 920	6 VOLT	627	708	813	870	920	5.52	14	22.34 (567)	10.30 (262)	24.01 (610)	315 (143)
SIND 06 1225	6 VOIT	835	942	1083	1159	1225	7 35	14	27 13 (689)	10 44 (265)	24 01 (610)	415 (188)
SIND 04 1695		1140	1202	1490	1504	1605	6.74	14	27.13 (007)	10.20 (262)	24.01 (610)	267 (167)
SIND 04 1065	4 VOLI	1 149	1295	1409	1394	2145	0.74	14	22.34 (307)	10.30 (202)	24.01 (010)	307 (107)
SIND 04 2145	4 VULI	14/4	1647	1896	2030	2145	8.58	14	27.22 (691)	10.44 (265)	24.01 (610)	465 (211)
SIND 02 1990	2 VOLT	1393	1547	1771	1889	1990	3.98	14	15.33 (389)	10.22 (260)	24.01 (610)	235 (107)
SIND 02 2450	2 VOLT	1712	1882	2166	2318	2450	4.90	14	17.33 (440)	10.22 (260)	24.01 (610)	278 (125)
	SOLAR P	REMIUM L	INE - DE	EP-CYCLE	FLOODED	BATTER	ES - WITH S	MART CARE	BON™ - 1,900	CYCLES @ 50	% DOD	
SPRE 12 225*	12 VOLT	179	204	212	216	225	2.70	6	14.97 (380)	6.91 (176)	14.71 (374)	132 (60)
SPRE 06 255	6 VOLT	211	229	244	249	255	1.53	16	10.30 (262)	7.13 (181)	11.74 (298)	67 (30)
SPRE 06 415*	6 VOLT	346	377	401	410	415	2.50	5	11.66 (296)	6.94 (176)	17.55 (446)	118 (54)
SPRF 02 1255*	2 V0I T	1039	1130	1203	1737	1255	2 51	5	11 66 (296)	6 94 (176)	17 55 (446)	119 (54)
51 112 02 1255	2 1011	SOL AR	SIGNAT		- DEEP-CV			PIES - 1 200			17.55 (110)	119 (54)
SSIG 12 170	12 VOLT	136	153	157	164	170	2 04	1,200	13 95 (354)	7 13 (181)	10 71 (272)	84 (38)
SSIG 12 230*	12 VOLT	192	209	214	223	230	2.04	6	14 97 (380)	6 91 (176)	14 67 (373)	114 (52)
SSIG 12 255*	12 VOLT	211	200	237	247	255	3.06	6	14 97 (380)	6.91 (176)	14 67 (373)	123 (56)
SSIG 06 235	6 V01T	196	214	220	217	235	1.42	1	10.30 (262)	7.13 (181)	10.74 (273)	58 (26)
SSIG 06 255	6 VOLT	211	229	237	247	255	1.53	1	10.30 (262)	7.13 (181)	10.74 (273)	62 (28)
SSIG 06 290	6 VOLT	243	265	237	281	290	1.74	1	10.30 (262)	7.13 (181)	11.48 (292)	72 (33)
SSIG 06 375*	6 VOLT	309	336	348	363	375	2.25	6	11.66 (296)	6.94 (176)	14.37 (365)	96 (44)
SSIG 06 405*	6 VOLT	337	366	376	392	405	2.43	6	11.66 (296)	6.94 (176)	14.37 (365)	98 (44)
SSIG 06 475*	6 VOLT	393	428	441	459	475	2.85	5	11.66 (296)	6.94 (176)	17.55 (446)	114 (52)
SSIG 06 490*	6 VOLT	407	443	455	474	490	2.94	5	11.66 (296)	6.94 (176)	17.55 (446)	125 (57)
		SOLA	R SIGNA	FURE LINE	- DEEP-C	YCLE FLO	ODED BATT	ERIES - 600	CYCLES @ 50	% DOD		
SSIG 12 95	12 VOLT	79	87	88	92	95	1.14	7	10.92 (277)	6.62 (168)	9.25 (235)	47 (21)
SSIG 12 120	12 VOLT	99	107	111	116	120	1.44	9	12.84 (326)	6.60 (168)	9.74 (247)	55 (25)
SSIG 12 145	12 VOLT	122	132	135	140	145	1.74	9	13.94 (354)	6.75 (171)	10.09 (256)	66 (30)
			SOLAR A	GM LINE -	DEEP-CY	CLE AGM	BATTERIES -	1,700 CYCL	ES @ 50% DO	D		
SAGM 12 135	12 VOLT	131	135	136	137	137	1.62	5, 15	12.96 (329)	7.06 (179)	10.96 (278)	83 (38)
SAGM 12 205	12 VOLT	174	205	210	213	216	2 46	5, 15	14,97 (380)	6.94 (176)	14.07 (357)	131 (59)
SAGM 08 165	8.VOIT	1/15	165	168	171	174	1 22	5,15	10.30 (262)	7.06 (179)	10.73 (273)	70 (32)
SAGM 00 TOS	OVOLT	140	220	220	221	1/4	1.52	5, 15	10.30 (202)	7.00 (173)	10.75 (275)	(0 (31)
SAGM 06 220	6 VULI	190	220	228	231	235	1.32	5, 15	10.30 (262)	7.06 (179)	10.73 (273)	68 (31)
SAGM 06 315	6 VOLT	278	315	326	331	335	1.89	5, 15	11.66 (296)	6.94 (176)	13.99 (355)	95 (43)
SAGM 06 375	6 VOLT	329	375	389	394	400	2.25	5, 15	11.66 (296)	6.94 (176)	16.31 (414)	114 (52)
				DEEP-CYC	CLE AGM E	BATTERIE	S ^E - 1,000 CY	CLES @ 50%	DOD			
U1-AGM	12 VOLT	31	33	-	-	34	0.41	15	7.78 (198)	5.20 (132)	6.75 (171)	27 (12)
24-AGM	12 VOLT	70	76	-	-	84	1.01	6	10.77 (274)	6.84 (174)	8.62 (219)	54 (24)
27-AGM	12 VOLI	82	89	-	-	99	1.19	6	12.05 (306)	6.84 (174)	9.32 (237)	64 (29)
31-AGM	12 VOLI	92	100	-	-	111	1.33	6	13.42 (341)	6.81 (1/3)	9.18 (233)	69 (31)
TZ-AGIM	12 VULI	127	140	DEEP-CV			1.72 E - 1 000 CV(D D ES @ 50%	13.34 (344)	0.70(172)	10.88 (276)	100 (45)
24-GFI	12 VOLT	72	77		-	85	1 02	6	10.92 (277)	6.61 (168)	9,26(235)	52 (24)
27-GEI	12 VOLT	84	91	_	-	100	1.20	7	12,73 (323)	6.38 (162)	9.26 (235)	62 (23)
31-GFI	12 VOLT	94	102	-	-	108	1.30	7	12.94 (329)	6.82 (173)	9.64 (245)	70 (32)
5SHP-GEL	12 VOLT	115	125	-	-	137	1.64	8	13,58 (345)	6.75 (172)	11.01 (280)	85 (39)
8D-GEL	12 VOLT	207	225	-	-	265	3.18	5	20.69 (526)	10.95 (278)	10.82 (275)	168 (76)
8V-GEL	8VOLT	127	140	-	-	160	1.28	6	10.31 (262)	7.13 (181)	10.88 (276)	70 (32)
6V-GEL	6 VOLT	167	189	-	-	198	1,19	6	10.25 (260)	7.08 (180)	10.82 (275)	68 (31)
TE35-GEL	6 VOLT	193	210	-	-	220	1.32	8	9.64 (245)	7.51 (191)	10.65 (271)	69 (31)

^{*} Polyon™ Case

A. B. D. E. F.

The amount of amp-hours (Ah) for Solar Line batteries can deliver when discharged at a constant rate at 86°F (30°C) and maintain a voltage above 1.75 V/cell. Capacities are based on peak performance. Dimensions may vary depending on type of handle or terminal. Batteries to be mounted with *J*. Sinches (12.7 mm) spacing minimum. Dimensions taken from bottom of the battery to the highest point on the battery. Heights may vary depending on type of terminal. Weight may vary. The amount of amp-hours (Ah) for Deep-Cycle AGM and GEL batteries 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. The Energy (kWh) for the Solar AGM batteries are based on the 20-Hr Rate.





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 9001:2015 =





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 12380 Clark Street, Santa Fe Springs, CA 90670 • USA or email marketing@trojanbattery.com TRJN0159_RESeriesColl_111317

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