

# SOLARPRO-GEL™ Series



SOLARPRO-GEL™ Series –Battery Bank



## SOLARPRO-GEL™ Series –XUNZEL

### XUNZEL Maintenance-Free and Deep-Cycle GEL Solar Battery Banks for Renewable Energy Applications

#### Product Overview

- Totally Maintenance-Free Solar Battery Banks. Do not need to be refilled with water during the whole service life
- Sealed & Safe. Non-spillable
- Deep-cycle Valve-Regulated Lead-Acid (VRLA) GEL Battery Banks
- Ideal for Medium and Large Off-Grid and Off-Shore Photovoltaic and Wind applications, UPS and Back-up, telecom and CATV, traffic, agricultural, marine and caravan, cathodic protection, professional installations,...
- Allows horizontal installation
- Rugged durability and long service life
- Outstanding performance, even under extreme conditions
- Robust positive tubular-plates to ensure high cycle life
- Fully insulated battery design to ensure touch protection
- Very good recharge behaviour
- Excellent deep discharge capability
- Low self-discharge rate and high efficiency
- Easy access for measurements of e.g. voltage
- Solve limited floor space and access problems on board boats and vehicles
- Optional pole connectors available for different configurations
- Available different racks models

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Industry Leading Technology for Off-Grid, Off-Shore and Backup Power Applications



SOLAR



WIND



UPS-BACKUP ENERGY



CARAVAN CAMPING



AUTOMOTIVE MOBILE



MARINE BOAT



STREET LIGHTING



TELECOM CATV



TRAFFIC SECURITY



ELECTRONICS IoT



INDUSTRY



AGRICULTURAL SMART FARM



HOME



GARDEN

# SOLARPRO-GEL™ Series

## Models and Specifications

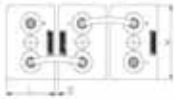
12V Battery Banks (6 cells/bank)		24V Battery Banks (12 cells/bank)		48V Battery Banks (24 cells/bank)		Discharge Rate							R <sub>1</sub>	R <sub>1</sub>	Length per cell (L)	Width per cell (W)	Height per cell (H)	Weight per cell		
Model	Battery Bank Weight Kg	Model	Battery Bank Weight Kg	Model	Battery Bank Weight Kg	C <sub>1h</sub> Ah	C <sub>10h</sub> Ah	C <sub>20h</sub> Ah	C <sub>72h</sub> Ah	C <sub>100h</sub> Ah	C <sub>120h</sub> Ah	C <sub>240h</sub> Ah	mΩ	kA	mm	mm	mm	Kg		
						Cut-off Voltage, U (V/cell) (DOD 100%)														
						1,67	1,80	1,80	1,80	1,80	1,80	1,80	1,80							
SXPROGEL158B6	74,4	SXPROGEL158B12	148,8	SXPROGEL158B24	297,6	71	121	134	153	157	158	165	1.65	1.30	105	208	420	12.4		
SXPROGEL238B6	102,6	SXPROGEL238B12	205,2	SXPROGEL238B24	410,4	107	182	202	229	236	238	247	1.15	1.86	105	208	420	17.1		
SXPROGEL318B6	116,4	SXPROGEL318B12	232,8	SXPROGEL318B24	465,6	143	243	268	306	314	318	331	0.89	2.40	105	208	420	19.4		
SXPROGEL397B6	139,8	SXPROGEL397B12	279,6	SXPROGEL397B24	559,2	179	304	336	383	393	397	412	0.73	2.91	126	208	420	23.3		
SXPROGEL477B6	164,4	SXPROGEL477B12	328,8	SXPROGEL477B24	657,6	215	364	404	460	472	477	496	0.63	3.39	147	208	420	27.4		
SXPROGEL589B6	188,4	SXPROGEL589B12	376,8	SXPROGEL589B24	753,6	254	447	506	570	583	589	609	0.68	3.14	126	208	535	31.4		
SXPROGEL693B6	221,4	SXPROGEL693B12	442,8	SXPROGEL693B24	885,6	302	529	598	671	686	693	715	0.58	3.64	147	208	535	36.9		
SXPROGEL795B6	254,4	SXPROGEL795B12	508,8	SXPROGEL795B24	1017,6	350	610	688	770	788	795	820	0.52	4.12	168	208	535	42.4		
SXPROGEL978B6	306	SXPROGEL978B12	612	SXPROGEL978B24	1224	417	729	834	943	968	978	1,012	0.46	4.63	147	208	710	51.0		
SXPROGEL1,154B6	371,4	SXPROGEL1,154B12	742,8	SXPROGEL1,154B24	1485,6	492	858	980	1,116	1,140	1,154	1,195	0.36	5.81	215	193	710	61.9		
SXPROGEL1,296B6	412,8	SXPROGEL1,296B12	825,6	SXPROGEL1,296B24	1651,2	559	970	1,106	1,252	1,280	1,296	1,344	0.32	6.54	215	193	710	68.8		
SXPROGEL1,464B6	462	SXPROGEL1,464B12	924	SXPROGEL1,464B24	1848	616	1,090	1,252	1,418	1,450	1,464	1,524	0.34	6.29	215	235	710	77.0		
SXPROGEL1,620B6	503,4	SXPROGEL1,620B12	1006,8	SXPROGEL1,620B24	2013,6	691	1,200	1,382	1,562	1,600	1,620	1,675	0.28	7.50	215	235	710	83.9		
SXPROGEL1,764B6	553,2	SXPROGEL1,764B12	1106,4	SXPROGEL1,764B24	2212,8	748	1,320	1,512	1,713	1,750	1,764	1,836	0.28	7.56	215	277	710	92.2		
SXPROGEL1,920B6	595,2	SXPROGEL1,920B12	1190,4	SXPROGEL1,920B24	2380,8	822	1,440	1,644	1,857	1,900	1,920	1,989	0.24	8.63	215	277	710	99.2		
SXPROGEL2,088B6	649,2	SXPROGEL2,088B12	1298,4	SXPROGEL2,088B24	2598,8	839	1,570	1,772	2,023	2,070	2,088	2,169	0.27	7.86	215	277	855	108.2		
SXPROGEL2,256B6	699	SXPROGEL2,256B12	1398	SXPROGEL2,256B24	2796	927	1,710	1,918	2,181	2,230	2,256	2,337	0.23	9.18	215	277	855	116.5		
SXPROGEL2,508B6	788,4	SXPROGEL2,508B12	1576,8	SXPROGEL2,508B24	3153,6	1,040	1,890	2,120	2,426	2,490	2,508	2,592	0.18	11.91	215	400	815	131.4		
SXPROGEL2,772B6	847,2	SXPROGEL2,772B12	1694,4	SXPROGEL2,772B24	3388,8	1,125	2,070	2,320	2,678	2,740	2,772	2,880	0.17	12.63	215	400	815	141.2		
SXPROGEL2,868B6	887,4	SXPROGEL2,868B12	1774,8	SXPROGEL2,868B24	3549,6	1,191	2,170	2,420	2,772	2,840	2,868	2,976	0.16	13.25	215	400	815	147.9		
SXPROGEL3,036B6	937,2	SXPROGEL3,036B12	1874,4	SXPROGEL3,036B24	3748,8	1,265	2,300	2,580	2,937	3,000	3,036	3,144	0.15	13.94	215	400	815	156.2		
SXPROGEL3,300B6	1041,6	SXPROGEL3,300B12	2083,2	SXPROGEL3,300B24	4166,4	1,358	2,480	2,780	3,182	3,260	3,300	3,408	0.14	15.32	215	490	815	173.6		
SXPROGEL3,468B6	1088,4	SXPROGEL3,468B12	2176,8	SXPROGEL3,468B24	4353,6	1,433	2,610	2,920	3,348	3,420	3,468	3,576	0.13	16.03	215	490	815	181.4		
SXPROGEL3,624B6	1137,6	SXPROGEL3,624B12	2275,2	SXPROGEL3,624B24	4550,4	1,507	2,740	3,080	3,506	3,590	3,624	3,744	0.12	16.70	215	490	815	189.6		
SXPROGEL3,792B6	1186,8	SXPROGEL3,792B12	2373,6	SXPROGEL3,792B24	4747,2	1,581	2,870	3,220	3,664	3,750	3,792	3,912	0.12	17.37	215	490	815	197.8		
SXPROGEL4,272B6	1234,2	SXPROGEL4,272B12	2468,4	SXPROGEL4,272B24	4936,8	1,740	3,210	3,600	4,118	4,220	4,272	4,416	0.11	18.43	215	580	815	205.7		
SXPROGEL4,596B6	1332	SXPROGEL4,596B12	2664	SXPROGEL4,596B24	5328	1,887	3,470	3,900	4,442	4,550	4,596	4,752	0.10	19.76	215	580	815	222.0		
SXPROGEL4,764B6	1410,6	SXPROGEL4,764B12	2821,2	SXPROGEL4,764B24	5642,4	2,014	3,650	4,060	4,608	4,710	4,764	4,920	0.10	21.02	215	580	815	235.1		

1,2) Internal resistance Ri and short circuit current Isc according to IEC60896-21

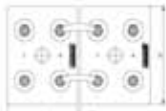
Height (H) is the maximum height between container bottom and top of the bolts in assembled condition.

All values given in the table correspond to 100 % DOD without voltage drop of connectors. Please consider the section "Operational Data"

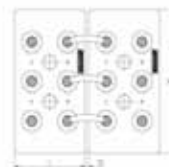
## Terminal Connections



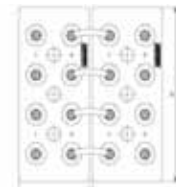
SXPROGEL158 to SXPROGEL978



SXPROGEL1,154 to SXPROGEL2,256



SXPROGEL2,508 to SXPROGEL3,036



SXPROGEL3,300 to SXPROGEL4,764

- Terminals: female poles with brass inlay M10 for flexible insulated copper cables with cross-section 25, 35, 50, 70, 95 or 120mm<sup>2</sup> or insulated solid copper connectors with cross-section 90, 150 or 300mm<sup>2</sup>
- Set up the cells with the correct polarity
- Multipole cells: connect all poles by connectors with same diameter and length
- Distance between cells: 10mm
- Cells connected in parallel: apply the same thermal environment and the same electric connection resistance

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## Design

- Positive electrode: tubular-plate with woven polyester gauntlet and solid grids in a corrosion-resistant PbCaSn-alloy
- Negative electrode: grid-plate in PbCaSn-alloy with long-life expander material
- Separation: microporous separator
- Electrolyte: sulphuric acid with a density of 1.24kg/l (20°C), fixed as GEL by fumed silica
- Container and lid: high impact ABS (Acrylonitrile-Butadiene-Styrene), grey coloured (colour may vary slightly from given image), UL-94 rating: HB, on request also in UL-94 rating V-0
- Valve: valve with flame arrestor, opening pressure approx. 120mbar
- Pole bushing: 100% gas- and electrolyte-tight, sliding, plastic coated
- Protection: IP25 regarding EN60529
- Horizontal operation: the construction and production of SOLARPRO-GEL™ Solar Battery Banks are adapted to the horizontal operation

## Installation

- SOLARPRO-GEL™ Solar Battery Banks are designed for indoor applications. For outdoor applications please contact XUNZEL
- Before installation ensure that the battery room is clean, well-ventilated and dry and is furnished with a lockable door. The battery room must be set out and marked according to EN 50272-2: Safety Requirements for Stationary batteries
- Batteries should be installed on racks or cabinets



Observe the operating instructions! Work on batteries under instruction of skilled personnel only, observing commissioning instructions and operating instructions for use!



Keep children away from batteries



When working on batteries wear safety glasses and protective clothing! Comply with accident prevention rules as well as with EN 50272-2 and DIN EN 50110-1 (VDE 0105-1)!



No smoking! Do not expose the battery to an open flame, a glowing fire or sparks as explosion and fire hazards exist.



The electrolyte (diluted sulphuric acid) is highly corrosive. Under normal operating conditions contact with electrolyte is prevented. In case of damage of the container contact with the gelled sulphuric acid has to be avoided. It is highly corrosive as well.



Dangerous voltage!



Block batteries and cells are extremely heavy! Ensure secure installation! Only use suitable measuring, handling, lifting and transport equipment and tools!



Acid splashes in the eyes or on the skin must be washed out or off with plenty of water. Then see a doctor immediately. Clothing exposed to acid should be washed out with water without delay.



Explosion and fire hazard due to explosive gases escaping from the battery. Caution! Metal parts of the battery are always live, therefore do not place items or tools on the battery! Avoid short circuits!

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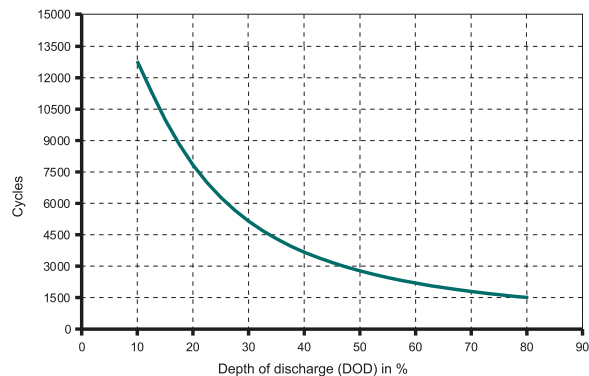
## Installation Maintenance

- SOLARPRO-GEL™ Solar Battery Banks are totally Maintenance-Free. Do not need to be refilled with water during the whole service life
- It is recommended to check and record voltage, temperature and connections of the cells room temperature, rack and cabinets and the operation mode of ventilation every 6 months

## Operational Data

- Depth of Discharge (DOD):
  - max. 80%U = 1.91V/cell for discharge times > 10h
  - U = 1.74V/cell for discharge = 1h
  - deep discharges of more than 80% DOD have to be avoided unlimited, the minimal charge current has to be 1.5A/100Ah C<sub>10</sub>
- Initial charge current (Bulk): 2.30V to 2.40V per cell, operating instruction is to be observed
- Absorption / cyclic operation: 2.25V/cell
- Float / non cyclic operation:
  - no adjustment necessary if battery temperature is between 10°C and 45°C (50°F and 113°F) in the monthly average
  - ΔU/ΔT = -3mV/°K per cell below 10°C (50°F)
- Adjustment of voltage: recharge to 100% as soon as possible (within a period of up to 4 weeks)
- Partial or complete discharge: > 3,000
- IEC 61427 Cycles: -20°C to 45°C (-4°F to 113°F).
- Temperature: 10°C to 30°C (50°F to 86°F)
- Recommended temperature: approx. 2% per month at 20°C (68°F)
- Self-discharge:

## Number of Cycles as Function of Depth of Discharge



## Transport

- Road transport: subjected to ADR, unless the conditions of Special Provisions 598 and 238 (Chapter 3.3) are observed
- Sea transport: conform to the IMDG-Code

## Standards and Material Safety Data Sheet-MSDS

- Test standards: IEC 60896-21, IEC 61427
- Standard for Flammability: UL 94 HB & V-0
- Safety Standard, ventilation: EN 50272-2
- SOLARPRO-GEL™ Solar Battery Banks follow Article 7, Paragraph 1 of the REACH Regulation. Material Safety Data Sheet –MSDS –Available on request

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