GNB®
INDUSTRIAL POWER
A Division of Exide Technologies

Industrial Batteries / Network Power

Sonnenschein SOLAR

*»**Premium quality** for **renewable energy**«*

Sonnenschein®

Industrial Batteries

The powerful range of Network Power

Energy storage solutions for critical systems that require uninterrupted power supply. GNB® Industrial Power offers powerful batteries for your individual needs. The below table is only indicative and depends on customers' specific applications. For more information please ask a GNB sales representative.

Applications	Battery ranges																	
	Sonnenschein						Marathon		Sprinter		Absolyte	Powerfit	Classic					
	A400/ A600	A400 FT	A500	A700	SOLAR	Rail	M FT	M/L/XL	S	P/XP	GP/GX	S200/ S300	GRoE	OCSM	OPzS	Energy Bloc/OGi	Solar	rail
Telecom	●	●	●	●			●	●	●		●			●	●	●		
UPS		●	●	●			●	●	●	●	●			●		●		
Emergency lighting	●		●					●		●		●			●	●		
Security	●		●	●						●		●		●	●			
Utility	●	●		●			●	●	●		●		●	●	●	●		
Railways	●	●	●	●		●	●	●	●		●			●		●		●
Photovoltaic					●						●						●	
Universal	●	●	●	●			●	●	●	●	●	●		●	●	●		

The GNB Network Power brand overview

ABSOLYTE™ MARATHON™ Sprinter® Powerfit™

> VRLA batteries (**V**alve **R**egulated **L**ead **A**cid) in which the electrolyte is fixed in an absorbent glass mat (AGM)
> Excellent high current capability
> Very economical
> Maintenance-free (no topping up)

Sonnenschein®

> VRLA batteries (**V**alve **R**egulated **L**ead **A**cid) in which the electrolyte is fixed in a gel (dryfit technology)
> Inventor of Gel technology
> Highest reliability, even in non-optimal conditions
> Particularly suitable for cyclic applications
> Maintenance-free (no topping up)

Classic™

> Conventional lead-acid batteries with liquid electrolyte
> Extreme reliability, proven over decades
> Low maintenance

BATTERY SERVICE ENERGY SOLUTIONS

> Further information about service is available on page 10

Sonnenschein SOLAR

The compact alternative for smaller solar applications

Sonnenschein SOLAR batteries are specially designed for small to medium performance requirements in leisure and consumer applications. The advantages of the maintenance free VRLA-batteries are enhanced by the worldwide excellent reputation and technical image of the dryfit technology.

Your benefits:

> **Excellent cycling performance** – 800 cycles at 60% Depth of Discharge C_{10} (at 20 °C)

> **dryfit Gel** – VRLA technology

> **Lowest energy consumption** – saving costs

> **Robust design** – resilient in harsh conditions

> **Proof against deep discharge** – greater long-term energy delivery

> **Completely recyclable** – low CO_2 footprint

Specifications:

> Nominal capacity 6.60 – 230 Ah C_{100} (20 °C)
> Long shelf life up to 2 years at 20 °C without recharge due to the very low self discharge rate
> Designed in accordance with IEC 61427 and IEC 60896-21/22
> Manufactured in Europe in our ISO 9001 certified production plants
> Trouble-free transport of operational blocks, no restrictions for rail, road, sea and air transportation (IATA, DGR, clause A67)
> Approval: UL (Underwriter Laboratories)

Nominal capacity 6.60 – 230 Ah C_{100} | Block battery | Grid plate | Recyclable | Valve regulated lead-acid batteries | Proof against deep discharge | Maintenance-free (no topping up) | 800 cycles at 60 % DoD C_{10}

Sonnenschein SOLAR
Technical data

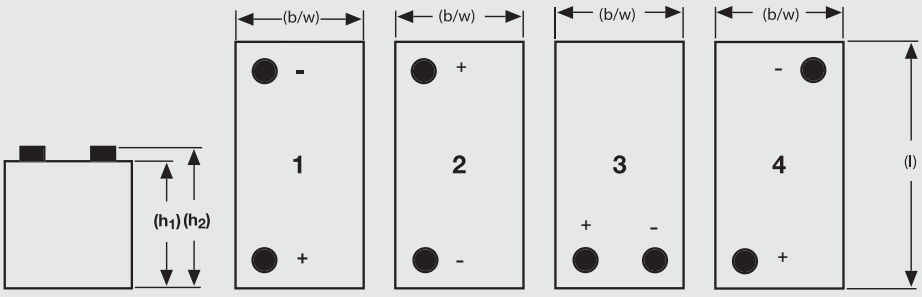
Technical characteristics and data

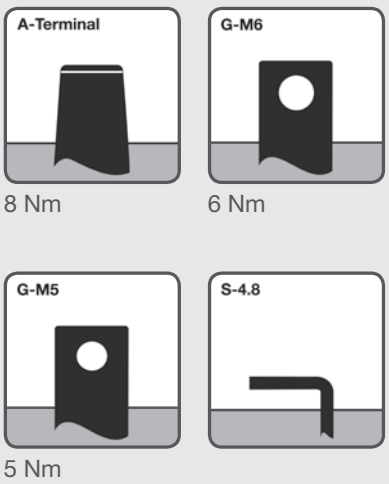
Type	Part number	Nom. voltage V	Nominal capacity C_{100} 1.80 Vpc 20 °C Ah	Discharge current I_{100} A	Length (l) max. mm	Width (b/w) max. mm	Height up to top of cover (h1) max. mm	Height including connectors (h2) max. mm	Weight approx. kg	Terminal	Terminal position
S12/6.6 S	NGS01206D6HS0SA	12	6.60	0.06	152	65.5	94.5	98.4	2.60	S-4.8	3
S12/17 G5	NGS0120017HS0BA	12	17.0	0.17	181	76.0	-	167	6.10	G-M5	1
S12/27 G5	NGS0120027HS0BA	12	27.0	0.27	167	176	-	126	9.60	G-M5	1
S12/32 G6	NGS0120032HS0BA	12	32.0	0.32	197	132	160	184	11.1	G-M6	2
S12/41 A	NGS0120041HS0CA	12	41.0	0.41	210	175	-	175	14.2	A-Terminal	1
S12/60 A	NGS0120060HS0CA	12	60.0	0.60	261	136	208	230	18.1	A-Terminal	1
S12/85 A	NGS0120085HS0CA	12	85.0	0.85	353	175	-	190	26.8	A-Terminal	1
S12/90 A	NGS0120090HS0CA	12	90.0	0.90	330	171	213	236	29.2	A-Terminal	2
S12/130 A	NGS0120130HS0CA	12	130	1.30	286	269	208	230	37.5	A-Terminal	4
S12/230 A	NGS0120230HS0CA	12	230	2.30	518	274	216	238	67.0	A-Terminal	3

Capacities C_1 - C_{100} (20 °C) in Ah

Type	C_1 1.70 Vpc	C_5 1.70 Vpc	C_{10} 1.70 Vpc	C_{20} 1.75 Vpc	C_{100} 1.80 Vpc
S12/6.6 S	2.90	4.60	5.10	5.70	6.60
S12/17 G5	9.30	12.6	14.3	15.0	17.0
S12/27 G5	15.0	22.1	23.5	24.0	27.0
S12/32 G6	16.9	24.4	27.0	28.0	32.0
S12/41 A	21.0	30.6	34.0	38.0	41.0
S12/60 A	30.0	42.5	47.5	50.0	60.0
S12/85 A	55.0	68.5	74.0	76.0	85.0
S12/90 A	50.5	72.0	78.0	84.0	90.0
S12/130 A	66.0	93.5	104	110	130
S12/230 A	120	170	190	200	230

Drawings with terminal position, terminal and torque





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Sonnenschein SOLAR BLOCK

Safe power supply for medium performance

The Sonnenschein SOLAR BLOCK battery range is very powerful and reliable in rough application conditions. This range is the ideal energy source for medium industrial solar systems, holiday and weekend houses, wind powerstations, as well as for other safety equipment power supplies.

Your benefits:

> **Excellent cycling performance** – 1200 cycles at 60% Depth of Discharge C_{10} (at 20 °C)

> **dryfit Gel** – VRLA technology

> **Lowest energy consumption** – saving costs

> **Robust design** – resilient in harsh conditions

> **Proof against deep discharge** – greater long-term energy delivery

> **Completely recyclable** – low CO_2 footprint

Specifications:

> Nominal capacity 60.0 – 330 Ah C_{100} (20 °C)
> Long shelf life up to 2 years at 20 °C without recharge due to the very low self discharge rate
> Designed in accordance with IEC 61427 and IEC 60896-21/22
> Manufactured in Europe in our ISO 9001 certified production plants
> Trouble-free transport of operational blocks, no restrictions for rail, road, sea and air transportation (IATA, DGR, clause A67)
> Approval: UL (Underwriter Laboratories)

Nominal capacity 60.0 – 330 Ah C_{100} | Block battery | Grid plate | Recyclable | Valve regulated lead-acid batteries | Proof against deep discharge | Maintenance-free (no topping up) | 1200 cycles at 60 % DoD C_{10}

Sonnenschein SOLAR BLOCK
Technical data

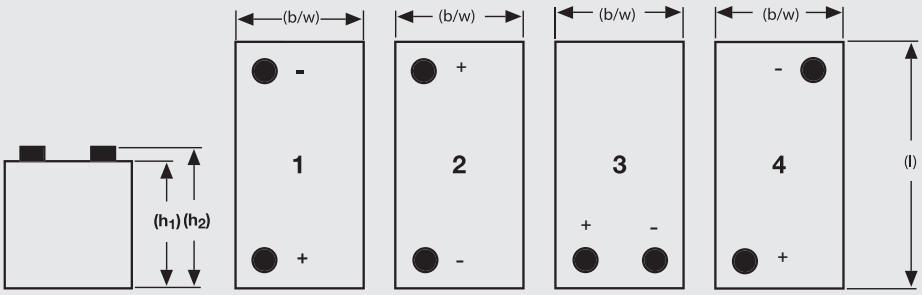
Technical characteristics and data

Type	Part number	Nom. voltage V	Nominal capacity C_{100} 1.80 Vpc 20 °C Ah	Discharge current I_{100} A	Length (l) max. mm	Width (b/w) max. mm	Height up to top of cover (h1) max. mm	Height including connectors (h2) max. mm	Weight approx. kg	Terminal	Terminal position
SB 6/200 A	NGSB060200HS0CA	6	200	2.00	246	192	254	275	29.0	A-Terminal	4
SB 6/330 A	NGSB060330HS0CA	6	330	3.30	312	182	337	359	47.0	A-Terminal	4
SB12/60 A	NGSB120060HS0CA	12	60.0	0.60	278	175	-	190	19.0	A-Terminal	1
SB12/75 A	NGSB120075HS0CA	12	75.0	0.75	330	171	214	236	26.5	A-Terminal	2
SB12/100 A	NGSB120100HS0CA	12	100	1.00	513	189	195	223	36.5	A-Terminal	3
SB12/130 A	NGSB120130HS0CA	12	130	1.30	513	223	195	223	45.5	A-Terminal	3
SB12/185 A	NGSB120185HS0CA	12	185	1.85	518	274	216	238	61.5	A-Terminal	3

Capacities C_1 - C_{100} (20 °C) in Ah

Type	C_1 1.70 Vpc	C_5 1.70 Vpc	C_{10} 1.70 Vpc	C_{20} 1.75 Vpc	C_{100} 1.80 Vpc
SB 6/200 A	104	153	162	180	200
SB 6/330 A	150	235	260	280	330
SB12/60 A	34.0	45.0	52.0	56.0	60.0
SB12/75 A	48.0	60.0	66.0	70.0	75.0
SB12/100 A	57.0	84.0	89.0	90.0	100
SB12/130 A	78.0	101	105	116	130
SB12/185 A	103	150	155	165	185

Drawings with terminal position, terminal and torque



8 Nm

Not to scale!

Sonnenschein A600 SOLAR

Unmatched dryfit Gel technology for renewable energy storage

Sonnenschein A600 SOLAR is a premium range, developed specifically for applications where cycling is required. It has extraordinary energy-saving features in addition to robust reliability, proven for decades in many installations worldwide.

Your benefits:

> **Exceptional cycling performance** – 3000+ cycles* at 60 % Depth of Discharge C_{10}

> **dryfit Gel** – VRLA technology

> **Lowest energy consumption** – saving costs

> **Strong tubular plate technology** – for longer life in the toughest conditions

> **Proof against deep discharge** – greater long-term energy delivery

> **Horizontal mounting possible** – easy installation and maintenance

> **Completely recyclable** – low CO_2 footprint

Specifications:

> Nominal capacity 294 – 3919 Ah C_{120} (20°C)
> Cycling performance at 20 °C (with IU charging): 2400 cycles at 60 % Depth of Discharge (C_{10}) at 20 °C
For enhanced performance and for systems ≥ 48 V we recommend IUI charging, to reach 3000+ cycles at 20 °C
> Designed in accordance with IEC 61427 and IEC 60896-21/22
> Long shelf life up to 2 years at 20 °C without recharge due to the very low self discharge rate
> Also available as flame-retardant version on request (V0)
> Manufactured in Europe in our ISO 9001 certified production plants
> Trouble-free transport of operational cells, no restrictions for rail, road, sea and air transportation (IATA, DGR, clause A67)
> Approval: UL (Underwriter Laboratories)

Nominal capacity 294 – 3919 Ah C_{120} | Single cell | Tubular plate | Recyclable | Valve regulated lead-acid batteries | Proof against deep discharge | Maintenance-free (no topping up) | 3000+ cycles* at 60 % DoD C_{10}

*With IUI charging, at 20 °C

Sonnenschein A600 SOLAR

Technical data

Technical characteristics and data

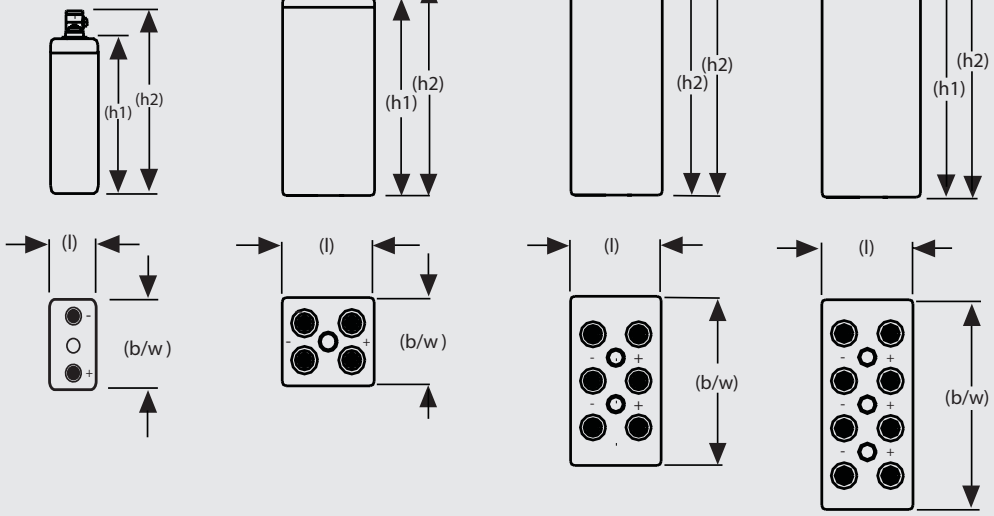
Type	Part number	Nom. voltage V	Nominal capacity C_{120} 1.85 Vpc 20 °C Ah	Discharge current I_{120} A	Length (l) max. mm	Width (b/w) max. mm	Height up to top of cover (h1) max. mm	Height incl. con-nectors (h2) max. mm	Weight approx. kg	Terminal	Pole pairs
A602/295 SOLAR	NGS6020295HS0FA	2	294	2.45	105	208	357	399	19.0	F-M8	1
A602/370 SOLAR	NGS6020370HS0FA	2	367	3.05	126	208	357	399	23.0	F-M8	1
A602/440 SOLAR	NGS6020440HS0FA	2	440	3.66	147	208	357	399	27.0	F-M8	1
A602/520 SOLAR	NGS6020520HS0FA	2	519	4.32	126	208	473	515	30.0	F-M8	1
A602/625 SOLAR	NGS6020625HS0FA	2	623	5.19	147	208	473	515	35.0	F-M8	1
A602/750 SOLAR	NGS6020750HS0FA	2	727	6.05	168	208	473	515	39.0	F-M8	1
A602/850 SOLAR	NGS6020850HS0FA	2	848	7.06	147	208	648	690	49.0	F-M8	1
A602/1130 SOLAR	NGS6021130HS0FA	2	1131	9.42	212	193	648	690	66.0	F-M8	2
A602/1415 SOLAR	NGS6021415HS0FA	2	1413	11.7	212	235	648	690	80.0	F-M8	2
A602/1695 SOLAR	NGS6021695HS0FA	2	1695	14.1	212	277	648	690	95.0	F-M8	2
A602/1960C SOLAR	NGS6021960HS0FB	2	1959	16.3	212	277	717	759	115	F-M8	2
A602/2600 SOLAR	NGS6022600HS0FA	2	2613	21.7	216	400	775	816	160	F-M8	3
A602/3270 SOLAR	NGS6023270HS0FA	2	3266	27.2	214	489	774	816	198	F-M8	4
A602/3920 SOLAR	NGS6023920HS0FA	2	3919	32.6	214	578	774	816	238	F-M8	4

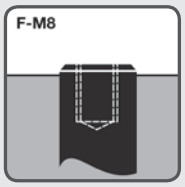
Capacities C_1 - C_{120} (20 °C) in Ah

Type	C_1 1.67 Vpc	C_3 1.75 Vpc	C_5 1.77 Vpc	C_{10} 1.80 Vpc	C_{100} 1.85 Vpc	C_{120} 1.85 Vpc
A602/295 SOLAR	123	167	193	218	286	294
A602/370 SOLAR	154	209	241	272	357	367
A602/440 SOLAR	185	251	290	326	429	440
A602/520 SOLAR	229	307	342	380	505	519
A602/625 SOLAR	275	369	410	456	606	623
A602/750 SOLAR	321	431	479	532	707	727
A602/850 SOLAR	367	513	626	681	829	848
A602/1130 SOLAR	489	684	834	908	1105	1131
A602/1415 SOLAR	612	855	1043	1135	1382	1413
A602/1695 SOLAR	734	1026	1252	1363	1658	1695
A602/1960C SOLAR	824	1209	1359	1573	1937	1959
A602/2600 SOLAR	1047	1548	1782	2025	2547	2613
A602/3270 SOLAR	1309	1935	2228	2532	3184	3266
A602/3920 SOLAR	1571	2322	2673	3038	3821	3919

Sonnenschein A600 SOLAR

Drawings with terminal position, terminal and torque





20 Nm

Not to scale!

Battery Service – Energy Solutions

Keeping your business on the move

GNB® is the Expert

Who could do this job better than the professionals of a company with more than 100 years of experience in battery development, production and application?

Leave the responsibility for the maintenance of your batteries and chargers to the professionals: a GNB service contract provides you with exceptional economic advantages through time savings, cost savings and safety!

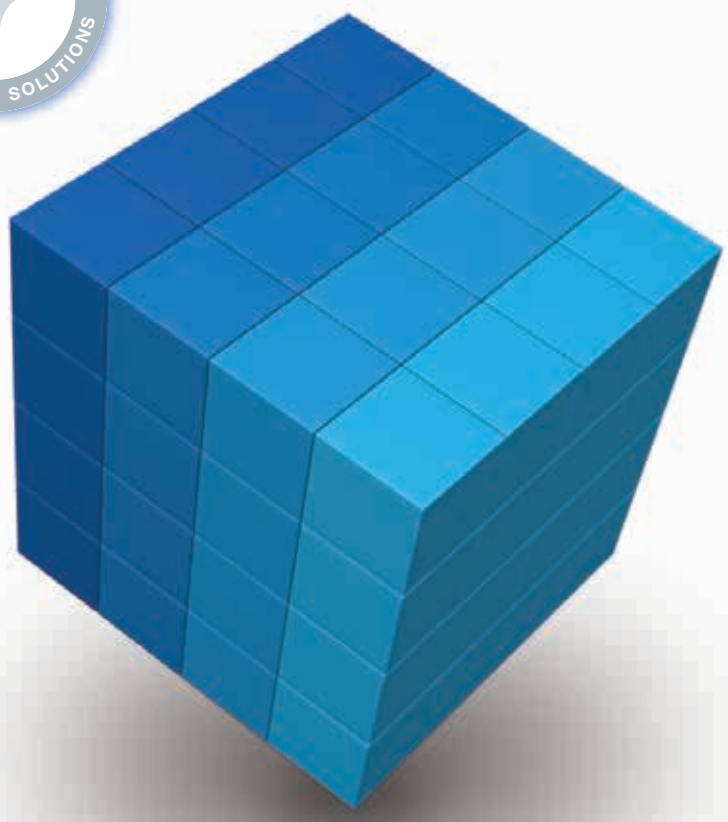
Installation of Batteries and Systems for Network Power

> Development of complete turnkey solutions from the design concept to installation and commissioning.

> Installation according to legal and safety regulations including CE certification by approved installation technicians.

> Training and certification of external installation technicians according to CE regulations.

BATTERY SERVICE ENERGY SOLUTIONS



- **Inspection Contract**
- **Maintenance Contract**
- **Lifetime Warranty Contract**
- **Full Service Contract**

*»**GNB Service** – individualized, professional and all over Europe!«*

Sonnenschein Solar

Notes

GNB®
INDUSTRIAL POWER
A Division of Exide Technologies

ABSOLYTE · Classic® · drysafe® · Element® · LIBERATOR®
2100 · MARATHON® · Powerfit® · Sonnenschein · Sprinter® · TENSOR®

Exide Technologies, with operations in more than **80 countries**, is one of the world's largest producers and recyclers of lead-acid batteries. Exide Technologies provides a comprehensive and customized range of stored electrical energy solutions. Based on **over 100 years of experience** in the development of innovative technologies, Exide Technologies is an esteemed partner of OEMs and serves the spare parts market for industrial and transportation applications.

GNB® INDUSTRIAL POWER – A division of Exide Technologies – offers an **extensive range of storage products and services**, including solutions for telecommunication systems, railway applications, mining, photovoltaic (solar energy), uninterrupted power supply (UPS), electrical power generation and distribution, fork lifts and electric vehicles.

Exide Technologies takes pride in its commitment to a better **environment**. Its Total Battery Management programme, (an integrated approach to manufacturing, distributing and recycling of lead-acid batteries), has been developed to ensure a safe and responsible life cycle for all of its products.

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*»The **next Level** of Energy Management«*

GNB® INDUSTRIAL POWER provides long lasting energy concepts that combine efficiency with flexibility.

www.gnb.com