GNB®
INDUSTRIAL POWER
A Division of Exide Technologies

Block batteries / Motive Power

Product Overview

*»**Durability** through **innovation**«*

Energy solutions

Always one step ahead

For GNB® Industrial Power, innovation is more than just an idea. It also has to generate useful applications. Market and application oriented demands challenge our research team on a daily basis. We are happy to take on this challenge and use our knowledge to provide our customers with the ideal solution.

By supporting co-operation between experts, we are able to provide batteries, charging devices and complete systems to meet the needs of global production and marketing strategies. This guarantees that you will always benefit from the latest developments when you work with us.

An outstanding proof of our innovative power is the invention of the dryfit® gel technology. Quickly recognizing its potential, GNB successfully developed an extensive product range for the Motive Power market.

More than just block batteries

Sonnenschein

A global brand with an excellent reputation and technical image providing industrial batteries with market leading gel technology for all Motive Power applications. Sonnenschein was established in 1910 and the brand has grown to symbolise pre-eminent dryfit® technology worldwide.

Classic®

A well established brand in Europe and many other countries. Classic represents quality and service in Motive Power applications with products that have been designed and manufactured to the most rigorous standards in flooded technology.

drysafe®

GNB® offers AGM batteries for traction applications under the drysafe® brand. A speciality of this range is the drysafe® RECUP batteries manufactured by GNB® – VRLA batteries with grids using a spiral wound design, which are characterized by high-current capability and micro cycles tolerance.

Sonnenschein M

one thousand cycles

Discover the latest innovation from GNB® Industrial Power – Sonnenschein M, [roman: M = thousand] the first gel block battery offering 1,000 cycles. The Sonnenschein M features significant improvements in cyclic endurance which helps reducing your operating costs. Especially suited to cleaning machines, scooters, wheelchairs, the gel battery is a reliable choice, well proven over many years.

dryfit® block batteries

Sonnenschein M (1,000 cycles gel battery)

Sonnenschein, with the robust and reliable dryfit® technology, takes the next step in product evolution: The innovative M technology which enables gel batteries to give 1,000 cycles at 70% depth of discharge.

With the experience of more than 120 years in battery manufacturing and continuous further development of the dryfit® gel technology, Sonnenschein managed to significantly extend the cycle life durability of gel batteries. The results are Sonnenschein M batteries with an excellent total cost of ownership for all traction purposes.

Main technical features and benefits:

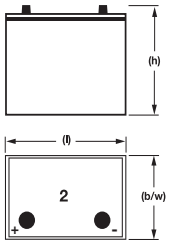
> Battery technology: VRLA (valve regulated lead-acid)
> Maintenance-free
(no topping up during the whole service life)
> Very high intrinsic safety
> Extremely robust and reliable
> Low self-discharge rate
> Up to 80% depth of discharge possible
> 1,000 cycles in accordance with IEC 60254-1

Technical characteristics and data

Type	Nominal voltage	Nominal capacity C_5 (30 °C)	Nominal capacity C_{20} (30 °C)	Length (l) max.	Width (b/w) max.	Height (h) max.	Weight	Terminal	Terminal position
	V	Ah	Ah	mm	mm	mm	kg		
GF 12 076 H	12	76	86	330	171	236	28.8	A-Terminal	2

Drawings with terminal position, terminal and torque

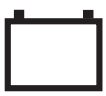
8 Nm



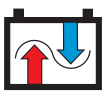
Not to scale!

Specifications


Nominal capacity 76 Ah (C_5) 86 Ah (C_{20})


Block battery


Grid plate


1,000 cycles in accordance with IEC 60254-1


Recyclable

Valve regulated lead-acid battery


Proof against deep discharge


Maintenance-free (no topping up)

Sonnenschein®

dryfit® block batteries

Sonnenschein GF-Y Range (dryfit® A500 cyclic)

The GF-Y block battery range is particularly suitable for the leisure and mobility market (wheelchairs, scooters, golf carts and electric boats).

Main technical features and benefits:

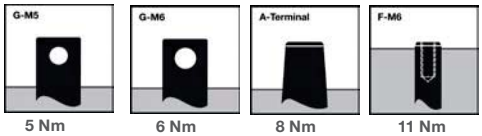
> Battery technology: VRLA (valve regulated lead-acid)
> Maintenance-free (no topping up during the whole service life)
> Very high intrinsic safety
> Robust, safe and reliable
> Low self-discharge rate
> 450 cycles in accordance with IEC 60254-1
> Product range:
12 V block batteries
14 Ah up to 93,5 Ah (C5)
15 Ah up to110 Ah (C20)

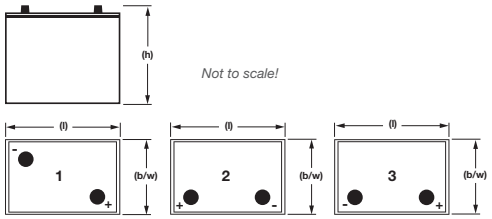
Technical characteristics and data

Type	Nominal voltage	Nominal capacity C_5 (30 °C)	Nominal capacity C_{20} (30 °C)	Length (l) max.	Width (b/w) max.	Height (h) max.	Weight	Terminal	Terminal position
	V	Ah	Ah	mm	mm	mm	kg		
GF 12 014 Y F	12	14.0	15.0	181	76.0	167	6.00	G-M5	3
GF 12 022 Y F	12	22.2	24.0	167	176	126	9.60	G-M5	3
GF 12 025 Y G	12	25.0	28.0	197	132	180	11.1	G-M5	2
GF 12 033 Y 1	12	32.5	38.0	210	175	175	14.6	A-Terminal	3
GF 12 033 Y G1*/G2	12	32.5	38	210	175	175	14.6	G-M6	3
GF 12 040 Y	12	40	48	242	175	190	17.5	A-Terminal	3
GF 12 044 Y	12	44	50	261	135	230	19	A-Terminal	3
GF 12 051 Y 1/ 2*	12	51	56	278	175	190	20.8	A-Terminal	3
GF 12 051 Y G1	12	51	56	278	175	190	20.8	G-M6	3
GF 12 052 Y O	12	52.7	60	261	170	178	19.8	F-M6	2
GF 12 063 Y O	12	63	70	261	171	210	23	F-M6	2
GF 12 065 Y*	12	65	78	353	175	190	26.8	A-Terminal	3
GF 12 072 Y	12	72	80	330	171	236	30	A-Terminal	2
GF 12 094 Y	12	93.5	110	286	269	230	38.5	A-Terminal	1

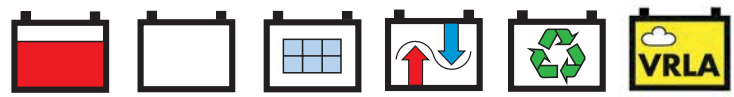
* with hold down

Drawings with terminal position, terminal and torque





Specifications



Nominal capacity 14 - 93,5 Ah (C_5) 15 - 110 Ah (C_{20}) | Block battery | Grid plate | 450 cycles in accordance with IEC 60254-1 | Recyclable | Valve regulated lead-acid batteries | Proof against deep discharge | Maintenance-free (no topping up)

Sonnenschein®

dryfit® block batteries
Sonnenschein GF-V Range (dryfit® traction block)

The GF-V block battery range is designed for hard industrial use. This includes applications such as cleaning machines, pallet trucks, automatic guided vehicles, mobile elevating work platforms, electric cars and buses.

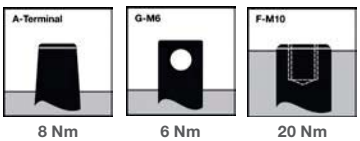
Main technical features and benefits:

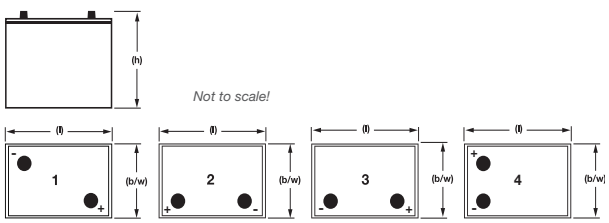
> Battery technology: VRLA (valve regulated lead-acid)
> Maintenance-free (no topping up during the whole service life)
> Very high intrinsic safety
> Robust, safe and reliable
> Low self-discharge rate
> 700 cycles in accordance with IEC 60254-1
> Product range:
6 V and 12 V block batteries
50 Ah up to 240 Ah (C_5)
55 Ah up to 270 Ah (C_{20})

Technical characteristics and data

Type	Nominal voltage	Nominal capacity C_5 (30 °C)	Nominal capacity C_{20} (30 °C)	Length (l) max.	Width (b/w) max.	Height (h) max.	Weight	Terminal	Terminal position
	V	Ah	Ah	mm	mm	mm	kg		
GF 06 160 V1	6	160	196	246	192	275	29.0	A-Terminal	1
GF 06 160 V2	6	160	196	264	183	270	33.0	A-Terminal	1
GF 06 180 V	6	180	200	246	192	275	31.0	A-Terminal	1
GF 06 180 V Q	6	180	200	246	192	284	31.5	F-M10	1
GF 06 240 V	6	240	270	311	183	358	47.0	A-Terminal	1
GF 12 050 V	12	50.0	55.0	278	175	190	19.0	A-Terminal	3
GF 12 050 V G	12	50.0	55.0	278	175	190	19.0	G-M6	3
GF 12 076 V	12	76	86	330	171	236	28.8	A-Terminal	2
GF 12 090 V	12	90	98	513	189	219	36.5	A-Terminal	4
GF 12 105 V	12	105	120	345	174	283	37.5	A-Terminal	3
GF 12 110 V	12	110	120	513	223	219	45.5	A-Terminal	4
GF 12 160 V	12	160	196	518	274	238	62.5	A-Terminal	4

Drawings with terminal position, terminal and torque





Specifications

Nominal capacity 50 - 240 Ah (C_5) 55 - 270 Ah (C_{20}) | Block battery | Grid plate | 700 cycles in accordance with IEC 60254-1 | Recyclable | Valve regulated lead-acid batteries | Proof against deep discharge | Maintenance-free (no topping up)

Sonnenschein®

VRLA block batteries

AGM technology range / drysafe and drysafe RECUP

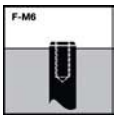
AF Range (AGM Technology)

The AF battery range is suitable for all light traction applications and combines favorable investment costs with no maintenance over the entire service life.

NEW!

Main technical features and benefits:

> Battery technology: VRLA (valve regulated lead-acid)
> Maintenance-free (no topping up during the whole service life
> 350 cycles at 60% depth of discharge (DoD)



11 Nm

Technical characteristics and data

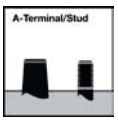
Type	Nominal voltage	Nominal capacity C_5 (30 °C)	Nominal capacity C_{20} (30 °C)	Length (l) max.	Width (b/w) max.	Height (h) max.	Weight	Terminal
	V	Ah	Ah	mm	mm	mm	kg	
AF 06 190 XOS	6	190.5	210.0	309	172	223	32.6	F-M6
AF 12 056 XOS	12	56.0	60.8	220	172	219	22.5	F-M6
AF 12 064 XOS	12	63.5	76.2	262	172	223	27.7	F-M6
AF 12 090 XOS	12	89.5	100.4	309	172	223	32.8	F-M6

drysafe®

AS Range with spiral wound technology

The AS range is suitable for all applications with a high power demand (discharge currents and charge acceptance), like hybrid drive and automatic guided vehicle systems. Additionally, AS-batteries offer excellent micro-cycle durability for applications with high opportunity charge rates, for example cleaning machines.

8 Nm



8/ 37 Nm

11Nm

Main technical features and benefits:

> VRLA battery with grids in a spiral wound design
> Maintenance-free (no topping up during the whole service life)
> Superior high power performance (discharge and charge acceptance)
> Good high power performance at low temperature
> Ideal for opportunity charging and fast charging
> Excellent micro-cycle durability, especially at partial state of charge
> Vibration resistant
> 450 cycles in accordance with IEC 60254-1

Technical characteristics and data

Type	Nominal voltage	Nominal capacity C_5 (30 °C)	Nominal capacity C_{20} (30 °C)	Length (l) max.	Width (b/w) max.	Height (h) max.	Weight	Terminal
	V	Ah	Ah	mm	mm	mm	kg	
AS 12 045 R	12	45.0	50.0	260	171	206	18.5	Stud/A-Terminal
AS 12 050 C	12	45.0	50.0	260	170	206	17.5	A-Terminal
AS 06 024 C	6	22.0	24.0	65.0	175	190	4.7	F-M6

drysafe® RECUP

Block batteries with tubular plates

Classic FT Range

The FT block battery range is designed for applications in harsh environments such as golf carts, cleaning machines, mobile elevating work platforms and electric elevating platform trucks.

Main technical features and benefits:

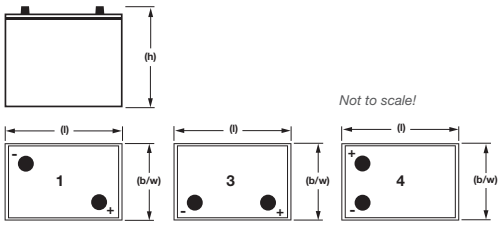
> Battery technology: Vented / tubular plates
> Extremely robust and reliable
> 900 cycles in accordance with IEC 60254-1
> Product range:
6 V and 12 V block batteries
52 Ah up to 200 Ah (C_5)
62 Ah up to 235 Ah (C_{20})

Technical characteristics and data

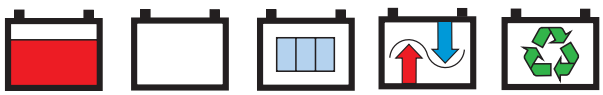
Type	Nominal voltage V	Nominal capacity C_5 (30 °C) Ah	Nominal capacity C_{20} (30 °C) Ah	Length (l) max. mm	Width (b/w) max. mm	Height (h) max. mm	Weight kg	Terminal	Terminal position
FT 06 180 1	6	180	210	246	190	276	29.0	A-Terminal	1
FT 06 180 2	6	180	210	265	184	269	29.0	A-Terminal	1
FT 06 200	6	200	235	265	185	269	32.0	A-Terminal	1
FT 12 072	12	72.0	86.0	328	176	216	25.0	A-Terminal	3
FT 12 110	12	110	132	347	176	285	39.0	A-Terminal	3
FT 12 150	12	150	180	511	218	229	53.0	A-Terminal	4

Drawings with terminal position, terminal and torque

8 Nm



Specifications



Nominal capacity 52 - 200 Ah (C_5) 62 - 235 Ah (C_{20}) | Block battery | Tubular plate | 900 cycles in accordance with IEC 60254-1 | Recyclable

Block batteries with grid plates
Classic FF Range

The Classic FF-range battery is suitable for mobile elevating work platforms, cleaning machines, leisure and many other Motive Power applications due to its high rate discharge capability.

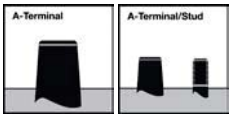
Main technical features and benefits:

> Battery technology: Vented / grid plates
> Good high rate discharge capability
> 300 cycles in accordance with IEC 60254-1
> Product range:
6 V and 12 V block batteries
40 Ah up to 296 Ah (C_5)
50 Ah up to 380 Ah (C_{20})

Technical characteristics and data

Type	Nominal voltage	Nominal capacity C_5 (30 °C)	Nominal capacity C_{20} (30 °C)	Length (l) max.	Width (b/w) max.	Height (h) max.	Weight	Terminal	Terminal position
	V	Ah	Ah	mm	mm	mm	kg		
FF 06 200 1	6	200	235	246	190	272	32.0	A-Terminal	1
FF 06 200 2	6	200	235	265	184	269	29.0	A-Terminal	1
FF 06 255	6	255	285	313	184	355	49.0	A-Terminal	1
FF 06 284 R	6	296	380	316	182	434	50.4	Stud/ A-Terminal	1
FF 12 040	12	40.0	50.0	210	175	190	13.7	A-Terminal	3
FF 12 050	12	50.0	62.0	242	175	190	17.3	A-Terminal	3
FF 12 060	12	60.0	75.0	278	175	190	20.7	A-Terminal	3
FF 12 080 1	12	80.0	100	353	175	190	26.4	A-Terminal	3
FF 12 080 2	12	80.0	100	349	175	235	29.2	A-Terminal	3
FF 12 085	12	85.0	110	328	174	216	27.0	A-Terminal	2
FF 12 105	12	105	125	513	189	223	45.5	A-Terminal	4
FF 12 110	12	110	130	349	175	285	33.0	A-Terminal	3
FF 12 135	12	135	180	513	223	223	47.8	A-Terminal	4
FF 12 144 R	12	148	200	393	180	364	49.4	Stud/A-Terminal	2
FF 12 200	12	200	235	520	275	241	62.7	A-Terminal	4

Drawings with terminal position, terminal and torque



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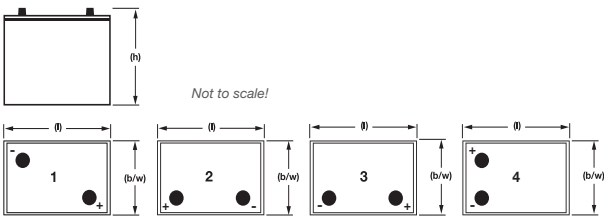
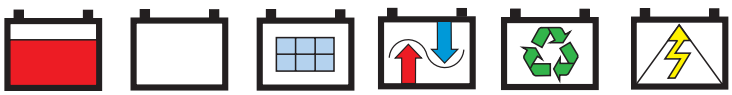


Specifications



Nominal capacity 40 - 296 Ah (C_5) 50 - 380 Ah (C_{20}) | Block battery | Grid plate | 300 cycles in accordance with IEC 60254-1 | Recyclable | Special high current performance

Chargers

2100 SP and 2100 OP

GNB® charger range

Incorporating the latest technology, these high frequency chargers are the ideal choice to recharge batteries on small electric vehicles, cleaning machines and pallet trucks. Suitable for flooded or valve regulated blocs and batteries, their design ensures reliability, safety, ease of use and optimal charging. These highly efficient chargers are reduced in size and weight, making them very easy to install and handle.

Your benefits:

- **Efficiency optimisation:**
  - GNB´s unique charger profiles and **dv/dt** charging time termination avoid any risk of under or over charging, therefore optimising battery usage and life
  - The charger ensures that the charging current and voltage remain constant during any mains fluctuations, guaranteeing a constant and optimised charging time
- **Very high energy efficiency due to HF technology – small CO_2 footprint**
- **Modern charging technology at an affordable price**
- **Easy-to-use automatic start - "plug & play"**
- **Small and light – requires less installation space**
- **Simple and comprehensible charging display (red-yellow-green)**
- **Integral wall mounting (2100 SP)**
- **Ready for fleet management 2100.net (2100 SP)**
- **Easy to install on-board version (2100 OP)**

Sonnenschein Batteries - Made in Germany

Battery and Charger 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 120 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 Motive 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.

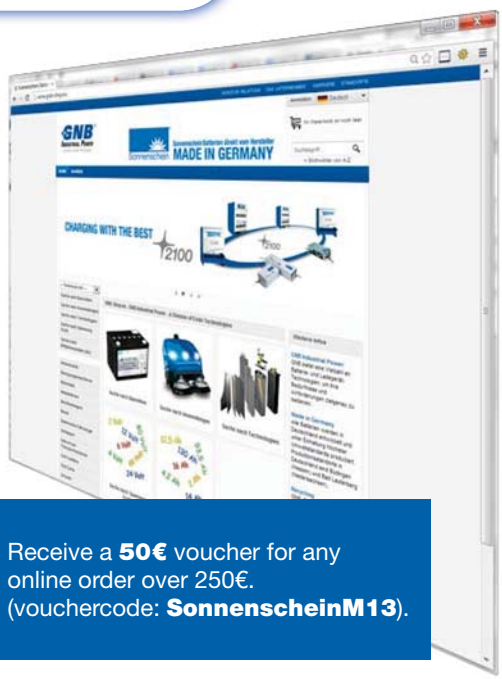
> Training and certification of external installation technicians according to CE regulations.

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

www.gnb-shop.eu

Visit our GNB® online shop*

Since July 2013 you can order GNB® products through our online shop **www.gnb-shop.eu**.
The easy and convenient way to buy our products.



Your benefits:

> Always fresh batteries directly from the factory
> Made in Germany
> Fast delivery
> Ordered directly from the manufacturer
> Assured manufacturer warranty
> Up-to-date and reliable product information

Receive a **50€** voucher for any online order over 250€.
(vouchercode: **SonnenscheinM13**).

* Currently deliveries within Germany only

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 automotive 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 energy (solar), uninterrupted power supply (UPS), electrical power generation and distribution, forklifts 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.

MXGBBPEPDF00114 Subjects to alterations.

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

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

www.gnb.com