

CATALOGUE

- Traction batteries
- Renewable Energy Storage
- Lithium Custom-made
- Stationary batteries
- Chargers
- Accessories



BatSup-1023

About us

Battery Supplies has the widest range of batteries, chargers & accessories.

Whether you need Traction batteries, Stationary batteries, Solar batteries, Lithium Custom-Made batteries... we have it.

- Established in 1999
- 90 people
- Turnover: 42.000.000 euro
- 2009: new SAP-system for a more efficient functioning thanks to barcode scanning and stock optimization
- 2012: move to a new building with over 10.000 m² of warehouse and offices
- OEM, Distributors, Repairshops, Battery dealers, Industry, Big Accounts, Professionals
- 2020: acquisition of company BATTEC in Erfstadt, Germany. Company active in sales, assembly and repair of batteries with a warehouse of 500m².





Our strengths

The advantage we want to offer our customers is the possibility to deliver small or big quantities of all these types of batteries to our dealers & customers all over the world.

Thanks to this strategy we can deliver you fresh top quality batteries in a very short time at sharp prices.

- Technical support: thanks to our technicians, we can continue to serve our customers after the sale (maintenance contracts, etc.)
- Large stock: in our 10.000m² warehouse.
- Different technologies: so we can offer the best solution for all applications.
- Dedicated knowledge



International

Don't worry about how to arrange the transport : whether it's by truck, by boat or by plane, we take care of it !

And for all your technical questions about batteries e.g. what type to use, how to maintain them, new technologies, dimensions, ... our technical sales team is there to answer all your questions by phone or mail.



About us

DIFFERENT TYPES OF BATTERIES

Battery Supplies has the widest range of Traction batteries, Stationary batteries, Solar batteries, Lithium Custom-Made batteries, chargers & accessories.



Traction - Motive power

Traction batteries are mainly used in heavy industrial electrical applications such as: electric forklift trucks, electric tractors, large industrial cleaning machines, aerial platforms, ...

A traction battery consists of several cells of 2V. When those cells are connected in series, you get higher voltages. A traction battery of 24 volts has 12 cells, a 48 volts battery has 24 cells, a 80 volts battery has 40 cells. To recharge a battery, the cell voltage has to be increased to above 2 volts by an external voltage source.

Traction batteries differ from starter batteries because they are developed to provide a certain amount of energy for longer periods. As a result, traction batteries usually have a much higher capacity than starter batteries.

Stationary - Back-up power

As the name says stationary batteries are made for stand-by or stationary applications. They are used as a back-up battery in case there is a power outage. There are many applications that are too important and should not fall without power, such as hospitals, alarm systems, servers, communication systems, ...

We only supply stationary batteries in maintenance-free versions. Since these batteries are usually in separate rooms, maintenance would soon be forgotten, and these batteries also have a long service life.



Solar storage

The use of batteries for storing renewable energy for industry has been growing enormously in recent years. These batteries have a threefold payback:

The excess of solar or wind energy is stored and later used in case of shortages. This increases the company's own consumption and less energy is injected and taken from the grid. This decrease is the most important profit factor of the battery.

Companies are heavily penalized financially for their peak consumption. A battery controlled by an intelligent EMS (Energy Management System) can smooth out these peaks (peak-shaving).

Energy prices react very erratically to general consumption, but also to the presence of sun and wind. This battery can store cheap energy from the grid to use itself at peak moments when energy is more expensive again.



Lithium Custom-made

Do you need a special Lithium-Ion battery for a specific application? No problem! Provide us with the required voltage (12, 24, 48, 80, ... volts), the required capacity and the dimensions and Battery Supplies makes a unique battery. For this we use 3V cells and our own developed BMS.

We supply a range of next generation, proven Battery Management Systems that will work for all high-power lithium batteries commonly used in a range of Electric Vehicle (and other) applications.

They are highly configurable in both hardware and software, allowing a range of battery systems from a few cells up to hundreds of cells. The modular design allows systems to be easily expanded with your needs, reconfiguring as required.

All chargers en accessories

Different types of batteries also means different types of chargers. Every type of battery needs a specific type of charger : open lead-acid, Gel, AGM, Li-Ion, ...

For chargers there are also different technologies : Traditional chargers, High-Frequency chargers, EV-chargers, ...

To completely satisfy all your battery needs, we have a full range of accessories such as : testers for batteries, cleaning products, safety devices & also all spare parts for batteries : connectors, automatic filling plugs, floaters, cables, bolts, ...



STOCK & FLEXIBILITY

Thanks to our big stock of battery cells, containers and parts we can assemble ready to use traction batteries in a very short time. Whether you only want the elements or you want the complete battery with a new container, automatic filling system, acid circulation system and the battery connector, our assembly team makes it possible within the shortest time. All we need is the machine type, voltage & capacity and/or dimensions, as simple as that : the rest is handled by us. The battery will be carefully packed to be delivered at your door : "ready for use", all you need to do is to install it into your forklift & start driving ...

SERVICE DEPARTMENT

We have our own service department for repairing & maintaining the batteries & chargers. We can perform capacity tests on batteries, regenerate batteries, and much more, right here in our company.

The electronic department is specialised in repairing all types of chargers: traditional or high frequency..



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Traction technologies



OPEN LEAD-ACID (PZS, PZB & MDL/MBS BLOCKS)

- The most representative solution portfolio for the Material Handling Industry.
- Vented lead acid battery with liquid electrolyte.
- Proven tubular plate technology provides long service life and excellent reliability, utilizing premium quality materials.



GEL (PZV)

- The maintenance free valve regulated gas recombination batteries with GEL electrolyte.
- Particularly suitable in the food, pharmaceutical and chemical industry.
- No acid leakage and minimum gas emissions.



LOW MAINTENANCE

- The low maintenance solution with up to 13 weeks interval.
- With special design and optimized alloys minimizes water consumption.
- Best solution to optimize customer's service cost.



CSM (Copper Stretch Metal)

- Based on CSM (Copper Stretch Metal) technology CSM batteries ensure increased performance, capacity and energy efficiency.
- Suitable for operation under extreme conditions (Cold Storage).
- Allowing fast and opportunity charging (2 shift use).



SQUARE

- Suitable for heavy-duty applications
- Increased capacity in standard cell design/volume
- Special chargers equipped with faster customized charging profiles allow also opportunity charging
- Square positive tubular plate
- Standard equipped with: central water filling system, acid circulation, capacitive battery electrolyte level sensor



EX-PROOF

- For Ex zones
- Open Lead-Acid and GEL technologies
- Certified ATEX and IECEx



PURE LEAD CARBON

- Maintenance Free, 99,99% Pure Lead
- Super fast charging and exceptional PSOC performance.
- Allows fast & intermediate charging.
- Lead Carbon added to negative electrodes increases power and reduces sulphation.



LI-ION

- The Li-Ion battery based on our vast know how and long experience for advanced applications.
- The combination of fast and opportunity charging with the battery's outstanding efficiency and charge acceptance enables multi-shift operation and an overall 24/7 availability

Traction technologies



Product Solution	DIN (PzS)	BS (PzB)	MDL-MBS Block	Gel (EPzV-PzVB)	LM
Application	Standard & Heavy Duty	Standard & Heavy Duty	Standard	Standard	Low Maintenance
Technology	Open Lead-Acid	Open Lead-Acid	Open Lead-Acid	VRLA (GEL)	Open Lead-Acid
Plate Design	Tubular Positive Plate	Tubular Positive Plate	Tubular Positive Plate	Tubular Positive Plate	Tubular Positive Plate
Gas Emission	Yes	Yes	Yes	Minimal	50 - 80% reduced gas emission
Top-Up with Demineralized Water	Weekly (every 5 charges)	Weekly (every 5 charges)	Weekly (every 5 charges)	-	8 - 13 weeks
Recommended Maintenance*	Every 3 months	Every 3 months	Yearly	Yearly	Every 3 months
Cell Design	IEC 60254-2 series L-E (2V DIN cells)	IEC 60254-2 series L-E (2V BS cells)	Multicell block (24 DIN-B/BS)	IEC 60254-2 series L-E (2V DIN-BS cells)	IEC 60254-1 & IEC254-1 (2V DIN cells)
Cell Voltage	2V	2V	2V (24V)	2V	2V
Cell Range (CS)	100 - 1150Ah	46 - 1188Ah	130 - 250Ah	104 - 1120Ah	250 - 1150Ah
Capacity	Standard	Standard	Standard	Standard	Standard
Inter-Cell Connections	Flexible connection	Flexible connection	Welded (internal)	Flexible connection	Flexible connection
Design Life	1500 cycles	1500 cycles	1500 cycles	1250 cycles (60% DOD)	1500 cycles
DOD	80%	80%	80%	60 - 80%	80%
Automatic Waterfill	Optional	Optional	Optional	-	Optional, recommended
Acid Circulation	Optional	Optional	-	-	Optional
Electrolyte Level Sensor	Optional	Optional	-	-	Optional
Datalogger	Optional	Optional	Optional	Optional	Optional
Best Charging Solution	7 to 12h, depending the selected charger	7 to 12h, depending the selected charger	7 to 12h, depending the selected charger	12h recommended, only adapted PZV charging profile	7 to 12h, depending the selected charger
Fast Charging	With fast charger and acid circulation up to 6,5h	With fast charger and acid circulation up to 6,5h	-	-	-
Charging Method	Transformer based or High Frequency Charger	Transformer based or High Frequency Charger	High Frequency Charger	GEL HF charger	High Frequency Charger
Charger Pump for Acid Circulation	In combination with acid circulation option	In combination with acid circulation option	-	-	In combination with acid circulation option
Container Colour	Standard or customized	Standard or customized	Polypropylene container	Standard or customized	Standard or customized
Special Features	Most Used Technology	Most Used Technology	Smart Low Budget Solution	No Maintenance	Low Maintenance

* Recommended inspection depends on usage. For more information, see page 151



Product Solution	CSM	Square (PSQ)	Atex (Ex)	Pure Lead Carbon	Lithium-Ion (LiFePO4)
Application	Heavy/Extreme Duty	Heavy/Extreme Duty	Atex Zone/Explosion Free	Special Applications	Special Applications
Technology	Open Lead-Acid/Copper	Open Lead-Acid	Open Lead-Acid/VRLA (GEL)	VRLA (AGM)	Lithium-ion
Plate Design	Tubular Positive Plate Copper Negative Plate	Square Positive Plate	Tubular Positive Plate	Thin Plate Pure Lead	Lithium-ion
Gas Emission	Yes	Yes	Yes	Minimal	None
Top-Up with Demineralized Water	Weekly (every 5 charges)	Weekly (every 5 charges)	Weekly (every 5 charges)	-	-
Recommended Maintenance*	Every 3 months	Every 3 months	Every 3 months	Yearly	Yearly
Cell Design	IEC 60254-2 series L-E (2V DIN cells)	IEC 60254-2 series L-E (2V DIN cells)	IEC 60254-2 series L-E (2V DIN-BS cells)	Multicell block	-
Cell Voltage	2V	2V	2V	12V	3,2V
Cell Range (CS)	260 - 1600 Ah	280 - 2040Ah	46 - 1860Ah	Custom Made	210 - 840 Ah
Capacity	Increased	Increased	Standard	High energy density	High energy density
Inter-Cell Connections	Flexible connection	Flexible connection	Flameproof Flexible Connector	Flexible connection	Laser Welded Bars
Design Life	> 1500 cycles	1800 cycles (70% DOD), 1500 cycles (80% DOD)	1500 cycles	1200 cycles	Up to 4000 cycles
DOD	80%	80%	80%	60%	80%
Automatic Waterfill	Optional	Included	Included	-	-
Acid Circulation	Optional	Included	Optional	-	-
Electrolyte Level Sensor	Optional	Included	-	-	-
Datalogger	Optional	Optional	-	Optional	Optional
Best Charging Solution	4,5 to 8h, depending the selected charger	7 to 12h, depending the selected charger	7 to 12h, depending the selected charger	4 to 8h, depending the selected charger	4 to 8h, depending working conditions
Fast Charging	With fast charger and acid circulation up to 4,5h	With fast charger up to 5,5h (Acid Circulation Standard)	Available, not recommended	Possible, up to 4h	Recommended, up to 2h
Charging Method	High Frequency Charger	High Frequency Charger	Transformer based or High Frequency Charger	High Frequency Charger	CCCV
Charger Pump for Acid Circulation	In combination with acid circulation option	Always, because of standard included acid circulation	In combination with acid circulation option	-	-
Container Colour	RAL 3001	Standard or customized	Standard or customized	Standard or customized	Standard or customized
Special Features	-15% internal resistance, Ideal for coldstore, longer lifetime, better Energy Throughput	Important increase of capacity, longer lifetime	With Certificates Atex & IECEx	-40°C to +65°C, PSOC, Made-to-Measure	Fully Customized, Available with Heating/Cooling

* Recommended inspection depends on usage. For more information, see page 151

Traction batteries



2 VOLT TRACTION CELLS

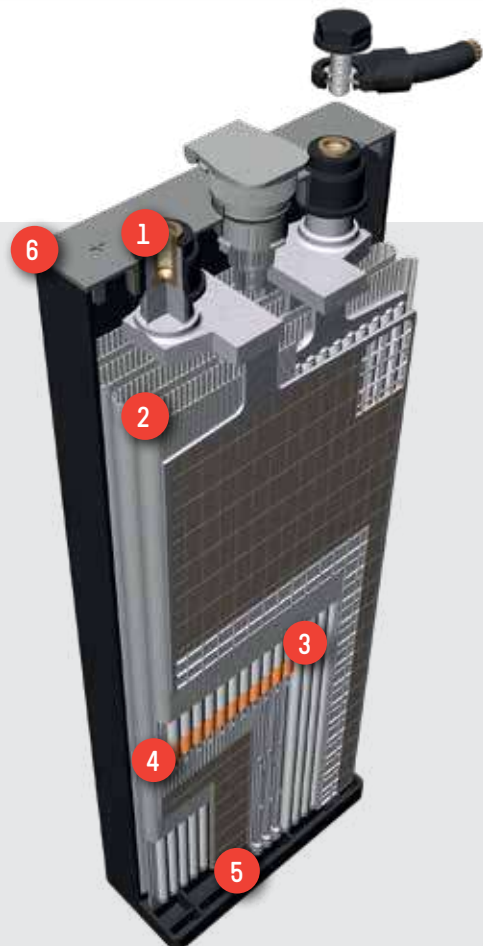
2 volt traction cells are mainly used in heavy industrial electrical applications, such as: electric forklifts, electric trucks, large industrial cleaning machines, tower wagons etc.

The cells are composed of positive tubular plates and negative grid plates, which guarantee a higher capacity and longer life than the conventional batteries with flat plates. The positive and negative plates are separated by a microporous separator in order to avoid mutual contact and short circuits. The plates are packed in a polypropylene container that is resistant to vibrations. At the bottom of this container, there is a reservoir to collect the precipitate and thus to prevent short circuits.

On top of the cells, there is a lid to prevent the coming-up of the separators by vibrations and shocks and causing a short circuit. The lid also protects against acid and protects the plates and the separators during filling. The cells are standard equipped with manual filler caps and a little basket which simplifies the refilling (refill up to the bottom of the basket).

2V CELL - INSIDE VIEW

- 1 Terminal**
Innovative conical design for perfect sealing
- 2 Separator**
Enveloped separator, preventing short-circuits
- 3 Tubular plate**
For long cycle life, endurance and high power density
- 4 Red Lead**
Produced with 99,99% pure lead for optimal performance
- 5 Bottom bar**
Ultrasonic welding with adequate space to absorb growth of spine
- 6 Full capacity**
Within the first 3 - 5 cycles



THE FOLLOWING VERSIONS ARE AVAILABLE



"S-version": the cells are linked by flexible screwed connections.

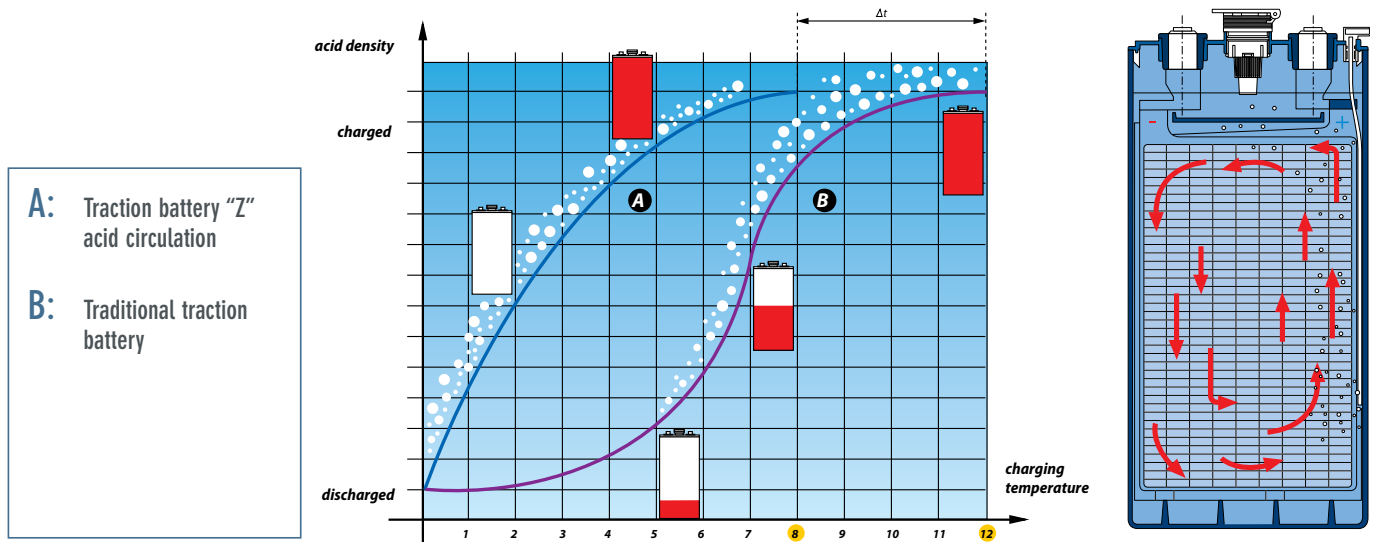


"A-version": automatic filling system on the basis of filler caps and floats.

Advantage: all cells are simultaneously refilled in an instant and without spilling up to the right level: time-saving!



"Z-version": Acid circulation version, cells with acid circulation. Every element contains a little tube in which the charger pumps a little quantity of air which makes the electrolyte circulate from the beginning of the charge (cf diagram)



THE CONTAINERS ARE AVAILABLE IN METAL AND PLASTIC



ADVANTAGES PLASTIC CONTAINER:

- Budget friendly
- Limited sizes
- Limited applications
- No battery change possible
- Light weight compared to coated steel
- Non-corrosive
- Easy to clean
- Battery acid resistant material
- Long life
- The battery is safely stored



ADVANTAGES METAL CONTAINER:

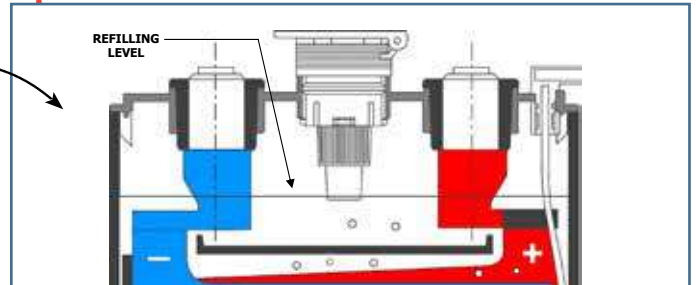
- Common choice
- All sizes available
- Acid resistant coating
- Different color options
- Robust
- For all applications
- Battery change possible

Traction batteries



A COUPLE OF TIPS FOR A LONGER BATTERY LIFE

- Only refill with demineralised water
- Refilling after charge
- Refilling up to the bottom side of the baskets: not higher!
- Keep the upper side of the battery dry and clean
- Use an adequate charger for battery & capacity
- Avoid intermediate charges



HOW TO ORDER A TRACTION BATTERY?

- Brand and type of the forklift truck
- Type of the battery & reference of the elements
- Voltage & Ah of the battery
- Size of the outerbox or of the elements: X x Y x H
- How much time does one work with the battery: one shift,...
- Options: autom. filling system, acid circulation
- Type of the battery plug
- Fill out the form on page 152 of this catalogue



OR CONTACT OUR SALES!

- Attention:
- Is my charger adapted to my battery?
 - How long do I have to charge?
- | | |
|-------------|--------------|
| 12 hours = | Wa-charger |
| 8 hours = | WoWa-charger |
| < 8 hours = | IUIa-charger |

FOR MAXIMUM SERVICE LIFE



► BAT/49206 Universal WiFi datalogger

The data logger is connected to an industrial vehicle battery. It monitors the main battery parameters, recording all essential values then ensuring its utmost care and efficiency.

By external sensors (bidirectional current sensor, thermic sensor, liquid level sensor) all battery data can be read, recorded and broadcasted along working and charging cycle of the machine.

Collected data allows detecting battery status as well as introducing appropriate corrections to charging process insuring an extended battery lifetime. By battery CAN Bus charger it is possible to modify real-time the charge algorithm.

More info: p. 106



BENEFITS OF ACID CIRCULATION

- Thanks to the constant charge over the total surface of the plates, the charging time is considerably reduced by ± 2 hours
- Lower charge factor: from 1,20 up to 1,05
- 15 % more energy saving
- Lower battery temperature
- 75 % less water consumption

TIP

Acid circulation in combination with high frequency charger results in a battery with maximum usability and a minimum of maintenance!



PROTECTION MAT

Protects the floor from damages and pollution. Protects the battery from heavy shocks.

- BAT/28351 : 120 x 100 x 2 mm - Soft finish
- Other sizes are available upon request

LET YOUR BATTERY TELL YOU WHEN IT NEEDS WATER!



Electrolyte level warning systems

The SmartBlinky™ battery watering monitor is ideal for batteries where the top of the battery can be seen. The SmartBlinky's Super Bright LED is eight times brighter than the previous model, providing a much clearer indication that the battery requires watering. The LED is integrated onto the probe body in a single piece that sits directly on the battery. This is the value model in the Blinky family of battery watering monitors. Works on all industrial lead acid batteries!

More info & other models: p. 119

Traction batteries

DIN - PZS

Our 2V cells and traction batteries are the most representative solution offered for our customers in the material handling industry. They are the proven vented solution with excellent reliability and long service life, using premium quality materials.

The cell design, state of the art production equipment and premium quality materials provide high end performance, excellent reliability and long service life.

Our PzS cell ranges, fully comply to the IEC 60254-1/2, DIN 43531, DIN 43535, DIN 43536, DIN 43537, EN 62485-3 standards and are available in DIN dimensions, ensuring full compatibility and flexibility for all battery applications.

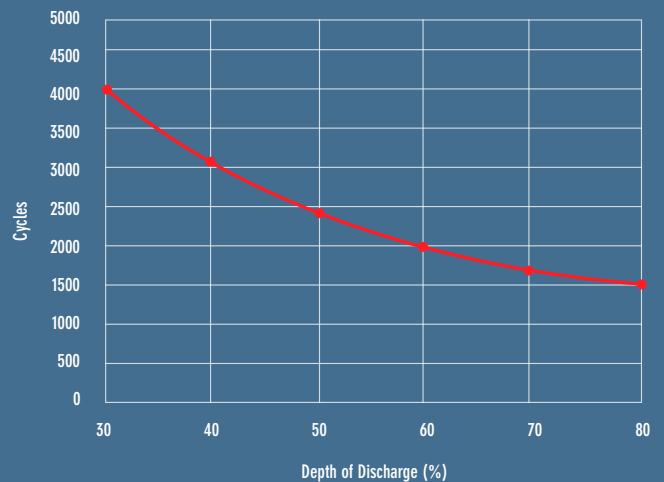
Positive tubular plate diameter 8.7 mm (more active material!), specific gravity of the electrolyte 1.29kg/L..



BENEFITS

- High capacity (exceed nominal values of international standards)
- Resistance to vibrations
- Short charging times
- Low consumption of distilled water
- Simple maintenance
- High performance, reliability and long service life
- High energy density
- Robust and durable construction
- High quality raw materials and components
- Recyclable

SERVICE LIFE: 1500 CYCLES DOD 80%



Cycle life in relation to Depth of discharge

APPLICATIONS



Forklifts



Industrial cleaning machines



Pallet jack



Access equipment



AGV



Marine



GSE

Also available in the special technologies:

- CSM
- SQUARE



CELL TYPE	Capacity (Ah/5h)	Discharge (A)	Charging current (A)		Weight (kg)		Dimensions (mm)			
			Start	End	Dry	Filled	X	Y	H	h
2 PzS 100	100	20	20	5	5,7	6,8	45	198	305	282
3 PzS 150	150	30	30	8	7,7	9,6	63	198	305	282
4 PzS 200	200	40	40	10	9,9	12,4	81	198	305	282
5 PzS 250	250	50	50	13	12,2	15,3	99	198	305	282
6 PzS 300	300	60	60	15	14,5	18,2	118	198	305	282
7 PzS 350	350	70	70	18	16,7	21,1	136	198	305	282
8 PzS 400	400	80	80	20	19,0	24,0	155	198	305	282
9 PzS 450	450	90	90	23	21,3	26,9	173	198	305	282
10 PzS 500	500	100	100	25	23,6	29,8	191	198	305	282
12 PzS 600	600	120	120	30	28,4	35,9	227	198	305	282
2 PzS 120	120	24	24	6	6,5	8,5	45	198	363	340
3 PzS 180	180	36	36	9	9,2	11,9	63	198	363	340
4 PzS 240	240	48	48	12	11,9	15,4	81	198	363	340
5 PzS 300	300	60	60	15	14,6	18,9	99	198	363	340
6 PzS 360	360	72	72	18	17,2	22,4	118	198	363	340
7 PzS 420	420	84	84	21	19,9	25,9	136	198	363	340
8 PzS 480	480	96	96	24	22,6	29,4	155	198	363	340
9 PzS 540	540	108	108	27	25,2	32,9	173	198	363	340
10 PzS 600	600	120	120	30	27,9	36,4	191	198	363	340
12 PzS 720	720	144	144	36	33,6	43,7	227	198	363	340
2 PzS 160	160	32	32	8	8,1	10,2	45	198	425	402
3 PzS 240	240	48	48	12	11,2	14,5	63	198	425	402
4 PzS 320	320	64	64	16	14,6	18,7	81	198	425	402
5 PzS 400	400	80	80	20	17,9	22,9	99	198	425	402
6 PzS 480	480	96	96	24	21,3	27,1	118	198	425	402
7 PzS 560	560	112	112	28	24,7	31,3	136	198	425	402
8 PzS 640	640	128	128	32	28,0	35,5	155	198	425	402
9 PzS 720	720	144	144	36	31,4	39,7	173	198	425	402
10 PzS 800	800	160	160	40	34,7	43,9	191	198	425	402
12 PzS 960	960	192	192	48	41,8	52,6	227	198	425	402
2 PzS 180	180	36	36	9	9,1	11,6	47	198	495	472
3 PzS 270	270	54	54	14	12,8	16,6	65	198	495	472
4 PzS 360	360	72	72	18	16,6	21,4	83	198	495	472
5 PzS 450	450	90	90	23	20,5	26,2	101	198	495	472
6 PzS 540	540	108	108	27	24,4	31,0	119	198	495	472
7 PzS 630	630	126	126	32	28,2	35,8	137	198	495	472
8 PzS 720	720	144	144	36	32,1	40,6	155	198	495	472
9 PzS 810	810	162	162	41	35,9	45,4	173	198	495	472
10 PzS 900	900	180	180	45	39,8	50,2	191	198	495	472
12 PzS 1080	1080	216	216	54	47,8	60,1	227	198	495	472
2 PzS 210	210	42	42	11	10,3	13,3	47	198	538	515
3 PzS 315	315	63	63	16	14,4	18,3	65	198	538	515
4 PzS 420	420	84	84	21	18,6	23,7	83	198	538	515
5 PzS 525	525	105	105	26	22,9	29,1	101	198	538	515
6 PzS 630	630	126	126	32	27,1	34,5	119	198	538	515
7 PzS 735	735	147	147	37	31,4	39,9	137	198	538	515

CELL TYPE	Capacity (Ah/5h)	Discharge (A)	Charging current (A)		Weight (kg)		Dimensions (mm)			
			Start	End	Dry	Filled	X	Y	H	h
8 PzS 840	840	168	168	42	35,6	45,3	155	198	538	515
9 PzS 945	945	189	189	47	39,9	50,7	173	198	538	515
10 PzS 1050	1050	210	210	53	44,5	56,4	191	198	538	515
12 PzS 1260	1260	252	252	63	53,0	67,2	227	198	538	515
2 PzS 230	230	46	46	12	10,8	14,0	47	198	568	545
3 PzS 345	345	69	69	17	15,3	19,8	65	198	568	545
4 PzS 460	460	92	92	23	19,9	25,6	83	198	568	545
5 PzS 575	575	115	115	29	24,8	31,4	101	198	568	545
6 PzS 690	690	138	138	35	29,6	37,2	119	198	568	545
7 PzS 805	805	161	161	40	34,5	43,0	137	198	568	545
8 PzS 920	920	184	184	46	39,3	48,8	155	198	568	545
9 PzS 1035	1035	207	207	52	44,5	54,9	173	198	568	545
10 PzS 1150	1150	230	230	58	49,3	60,7	191	198	568	545
12 PzS 1380	1380	276	276	69	59,0	72,3	227	198	568	545
2 PzS 250	250	50	50	13	11,6	14,7	47	198	593	570
3 PzS 375	375	75	75	19	16,2	20,7	65	198	593	570
4 PzS 500	500	100	100	25	21,1	26,9	83	198	593	570
5 PzS 625	625	125	125	31	26,0	33,1	101	198	593	570
6 PzS 750	750	150	150	38	30,9	39,3	119	198	593	570
7 PzS 875	875	175	175	44	35,8	45,5	137	198	593	570
8 PzS 1000	1000	200	200	50	40,7	51,7	155	198	593	570
9 PzS 1125	1125	225	225	56	45,9	58,2	173	198	593	570
10 PzS 1250	1250	250	250	63	50,8	64,4	191	198	593	570
12 PzS 1500	1500	300	300	75	60,6	76,8	227	198	593	570
2 PzS 280	280	56	56	14	14,4	20,6	47	198	709	686
3 PzS 420	420	84	84	21	19,4	25,3	65	198	709	686
4 PzS 560	560	112	112	28	25,1	32,2	83	198	709	686
5 PzS 700	700	140	140	35	30,9	39,5	101	198	709	686
6 PzS 840	840	168	168	42	36,6	46,7	119	198	709	686
7 PzS 980	980	196	196	49	42,3	54,0	137	198	709	686
8 PzS 1120	1120	224	224	56	48,0	61,2	155	198	709	686
9 PzS 1260	1260	252	252	63	54,1	68,8	173	198	709	686
10 PzS 1400	1400	280	280	70	59,8	76,0	191	198	709	686
12 PzS 1680	1680	336	336	84	71,3	90,5	227	198	709	686
2 PzS 310	310	62	62	16	14,9	21,5	47	198	743	720
3 PzS 465	465	93	93	23	20,6	26,1	65	198	743	720
4 PzS 620	620	124	124	31	26,7	33,5	83	198	743	720
5 PzS 775	775	155	155	39	32,9	41,1	101	198	743	720
6 PzS 930	930	186	186	47	39,0	48,9	119	198	743	720
7 PzS 1085	1085	217	217	54	45,1	56,7	137	198	743	720
8 PzS 1240	1240	248	248	62	51,3	64,5	155	198	743	720
9 PzS 1395	1395	279	279	70	57,8	72,8	173	198	743	720
10 PzS 1550	1550	310	310	78	64,0	80,6	191	198	743	720
12 PzS 1860	1860	372	372	93	76,2	96,2	227	198	743	720

Traction batteries

BS (BRITISH STANDARD) - PZB

Our 2V cells and traction batteries are the most representative solution offered for our customers in the material handling industry. They are the proven vented solution with excellent reliability and long service life, using premium quality materials.

The cell design, state of the art production equipment and premium quality materials provide high end performance, excellent reliability and long service life.

Our PzB cell ranges, fully comply to the IEC 60254-1/2, DIN 43531, DIN 43535, DIN 43536, DIN 43537, EN 62485-3 standards and are available in BS dimensions, ensuring full compatibility and flexibility for all battery applications.

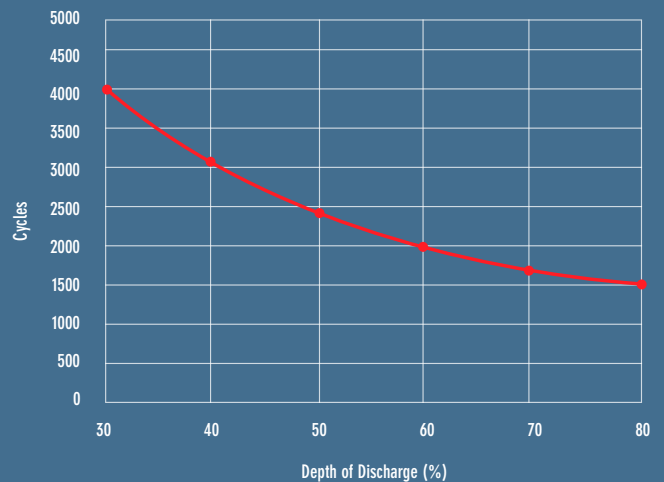
Positive tubular plate diameter 8.7 mm (more active material!), specific gravity of the electrolyte 1.29kg/L..



BENEFITS

- High capacity (exceed nominal values of international standards)
- Resistance to vibrations
- Short charging times
- Low consumption of distilled water
- Simple maintenance
- High performance, reliability and long service life
- High energy density
- Robust and durable construction
- High quality raw materials and components
- Recyclable

SERVICE LIFE: 1500 CYCLES DOD 80%



Cycle life in relation to Depth of discharge

APPLICATIONS



Forklifts



Industrial cleaning machines



Pallet jack



Access equipment



AGV



CELL TYPE	Capacity (Ah/5h)	Discharge (A)	Charging current (A)		Weight (kg)		Dimensions (mm)			
			Start	End	Dry	Filled	X	Y	H	h
2PzB46	46	9,2	9	2,3	3,0	3,7	45	157,5	240	216
3PzB69	69	14	14	3,5	4,2	5,4	61	157,5	240	216
4PzB92	92	18	18	4,6	5,4	6,9	77	157,5	240	216
5PzB115	115	23	23	5,8	6,6	8,4	93	157,5	240	216
6PzB138	138	28	28	6,9	7,8	10,0	109	157,5	240	216
7PzB161	161	32	32	8,1	9,0	11,6	125	157,5	240	216
8PzB184	184	37	37	9,2	10,2	13,2	141	157,5	240	216
9Pzb207	207	41	41	10,0	11,9	15,3	157	157,5	240	216
10PzB230	230	46	46	12,0	13,1	16,9	173	157,5	240	216
11PzB253	253	51	51	13,0	14,3	18,4	189	157,5	240	216
2PzB64	64	13	13	3,2	4,0	5,1	45	157,5	284	260
3PzB96	96	19	19	4,8	5,6	7,1	61	157,5	284	260
4PzB128	128	26	26	6,4	7,2	9,2	77	157,5	284	260
5PzB160	160	32	32	8,0	8,8	11,3	93	157,5	284	260
6PzB192	192	38	38	10,0	10,3	13,2	109	157,5	284	260
7PzB224	224	45	45	11,0	11,7	15,0	125	157,5	284	260
8PzB256	256	51	51	13,0	13,1	16,8	141	157,5	284	260
9PzB288	288	58	58	14,0	14,9	19,1	157	157,5	284	260
10PzB320	320	64	64	16,0	16,3	20,9	173	157,5	284	260
11PzB352	352	70	70	18,0	17,7	22,7	189	157,5	284	260
2PzB84	84	17	17	4,2	5,4	6,9	45	157,5	350	326
3PzB126	126	25	25	6,3	7,3	9,4	61	157,5	350	326
4PzB168	168	34	34	8,4	9,3	11,9	77	157,5	350	326
5PzB210	210	42	42	11,0	11,3	14,5	93	157,5	350	326
6PzB252	252	50	50	13,0	13,5	17,3	109	157,5	350	326
7PzB294	294	59	59	15,0	15,6	20,0	125	157,5	350	326
8PzB336	336	67	67	17,0	17,6	22,3	141	157,5	350	326
9PzB378	378	76	76	19,0	19,9	25,2	157	157,5	350	326
10PzB420	420	84	84	21,0	21,8	27,6	173	157,5	350	326
11PzB462	462	92	92	23,0	23,7	30,0	189	157,5	350	326
2PzB110	110	22	22	5,5	6,1	7,6	45	157,5	423	399
3PzB165	165	33	33	8,3	8,5	10,5	61	157,5	423	399
4PzB220	220	44	44	11,0	11,0	13,5	77	157,5	423	399
5PzB275	275	55	55	14,0	13,5	16,5	93	157,5	423	399
6PzB330	330	66	66	17,0	15,9	19,6	109	157,5	423	399
7PzB385	385	77	77	19,0	18,4	22,6	125	157,5	423	399
8PzB440	440	88	88	22,0	20,8	25,6	141	157,5	423	399
9PzB495	495	99	99	25,0	23,8	29,1	157	157,5	423	399
10PzB550	550	110	110	28,0	26,3	32,1	173	157,5	423	399
11PzB605	605	121	121	30,0	28,7	35,2	189	157,5	423	399
2PzB130	130	26	26	6,5	6,8	8,2	45	157,5	477	453
3PzB195	195	39	39	10,0	10,1	12,0	61	157,5	477	453
4PzB260	260	52	52	13,0	13,0	15,5	77	157,5	477	453
5PzB325	325	65	65	16,0	16,0	19,0	93	157,5	477	453
6PzB390	390	78	78	20,0	18,9	22,6	109	157,5	477	453



CELL TYPE	Capacity (Ah/5h)	Discharge (A)	Charging current (A)		Weight (kg)		Dimensions (mm)			
			Start	End	Dry	Filled	X	Y	H	h
7PzB455	455	91	91	23	21,8	26,1	125	157,5	477	453
8PzB520	520	104	104	26	24,5	29,6	141	157,5	477	453
9PzB585	585	117	117	29	27,9	33,6	157	157,5	477	453
10PzB650	650	130	130	33	30,6	37,2	173	157,5	477	453
11PzB715	715	143	143	36	33,3	40,7	189	157,5	477	453
2PzB150	150	30	30	8	7,5	10,0	45	157,5	537	513
3PzB225	225	45	45	11	10,8	13,9	61	157,5	537	513
4PzB300	300	60	60	15	14,1	17,8	77	157,5	537	513
5PzB375	375	75	75	19	17,5	21,6	93	157,5	537	513
6PzB450	450	90	90	23	20,9	25,6	109	157,5	537	513
7PzB525	525	105	105	26	24,1	29,6	125	157,5	537	513
8PzB600	600	120	120	30	27,4	33,5	141	157,5	537	513
9PzB675	675	135	135	34	31,1	38,2	157	157,5	537	513
10PzB750	750	150	150	38	34,2	42,3	173	157,5	537	513
11PzB825	825	165	165	41	37,3	46,4	189	157,5	537	513
2PzB170	170	34	34	9	-	11,5	45	158,0	597	570
3PzB255	255	52	52	13	-	16,2	61	158,0	597	570
4PzB340	340	69	69	17	-	20,5	77	158,0	597	570
5PzB425	425	86	86	22	-	25,0	93	158,0	597	570
6PzB510	510	103	103	26	-	29,4	109	158,0	597	570
7PzB595	595	120	120	30	-	33,8	125	158,0	597	570
8PzB680	680	138	138	34	-	38,4	141	158,0	597	570
9PzB765	765	155	155	39	-	42,6	157	158,0	597	570
10PzB850	850	172	172	43	-	47,2	173	158,0	597	570
11PzB946	946	189	189	47	39,7	51,4	189	157,5	597	570
2PzB200	200	40	40	10	9,4	11,8	45	157,5	632	608
3PzB300	300	60	60	15	13,5	16,6	61	157,5	632	608
4PzB400	400	80	80	20	17,5	21,5	77	157,5	632	608
5PzB500	500	100	100	25	21,6	26,4	93	157,5	632	608
6PzB600	600	120	120	30	25,6	31,5	109	157,5	632	608
7PzB700	700	140	140	35	29,7	36,4	125	157,5	632	608
8PzB800	800	160	160	40	33,7	41,4	141	157,5	632	608
9PzB900	900	180	180	45	38,6	47,1	157	157,5	632	608
10PzB1000	1000	200	200	50	42,7	52,0	173	157,5	632	608
11PzB1100	1100	220	220	55	46,7	56,9	189	157,5	632	608
2PzB210	210	43	43	11	-	14,1	45	158,0	713	686
3PzB315	315	65	65	16	-	19,4	61	158,0	713	686
4PzB420	420	86	86	22	-	24,8	77	158,0	713	686
5PzB525	525	108	108	27	-	30,1	93	158,0	713	686
6PzB630	630	130	130	32	-	35,4	109	158,0	713	686
7PzB735	735	151	151	38	-	40,9	125	158,0	713	686
8PzB840	840	173	173	43	-	46,3	141	158,0	713	686
11PzB1188	1188	238	238	59	50,4	62,8	189	157,5	712	688

Traction batteries

MONOBLOC 24V - MDL - MBS BLOCK

The 24V block battery DIN (open lead-acid) in a rugged polypropylene housing is designed to reduce voltage drop by using short intercell connectors integrated under the cover.

One of the greatest challenges in technological development is to create innovation, whilst introducing substantial improvements to both the production process and the resulting product, that positively impact quality, cost and application.

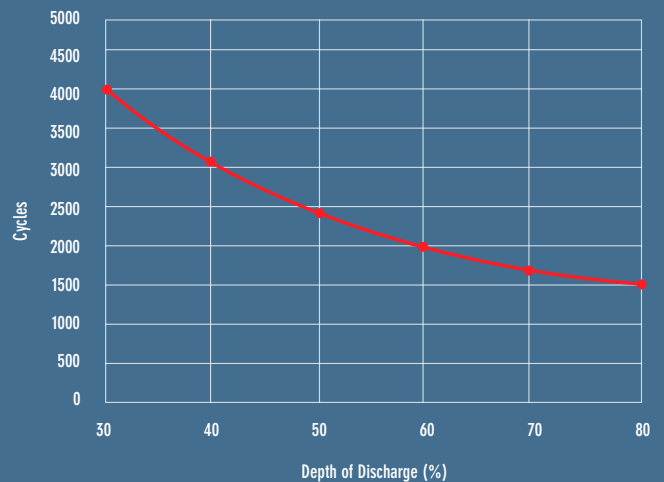
The "block project", 8 years on from the launch of the revolutionary MBSblock range, is now completed and significantly enhanced by the introduction of the new MDLblock versions to cover most of the applications on pallet trucks designed for British Standard and DIN-B 24V batteries up to 250 Ah/C5.



BENEFITS

- Low price
- Inter cell connectors
- Acid resistant polypropylene container

SERVICE LIFE: 1500 CYCLES DOD 80%



Cycle life in relation to Depth of discharge

APPLICATIONS



Pallet jack

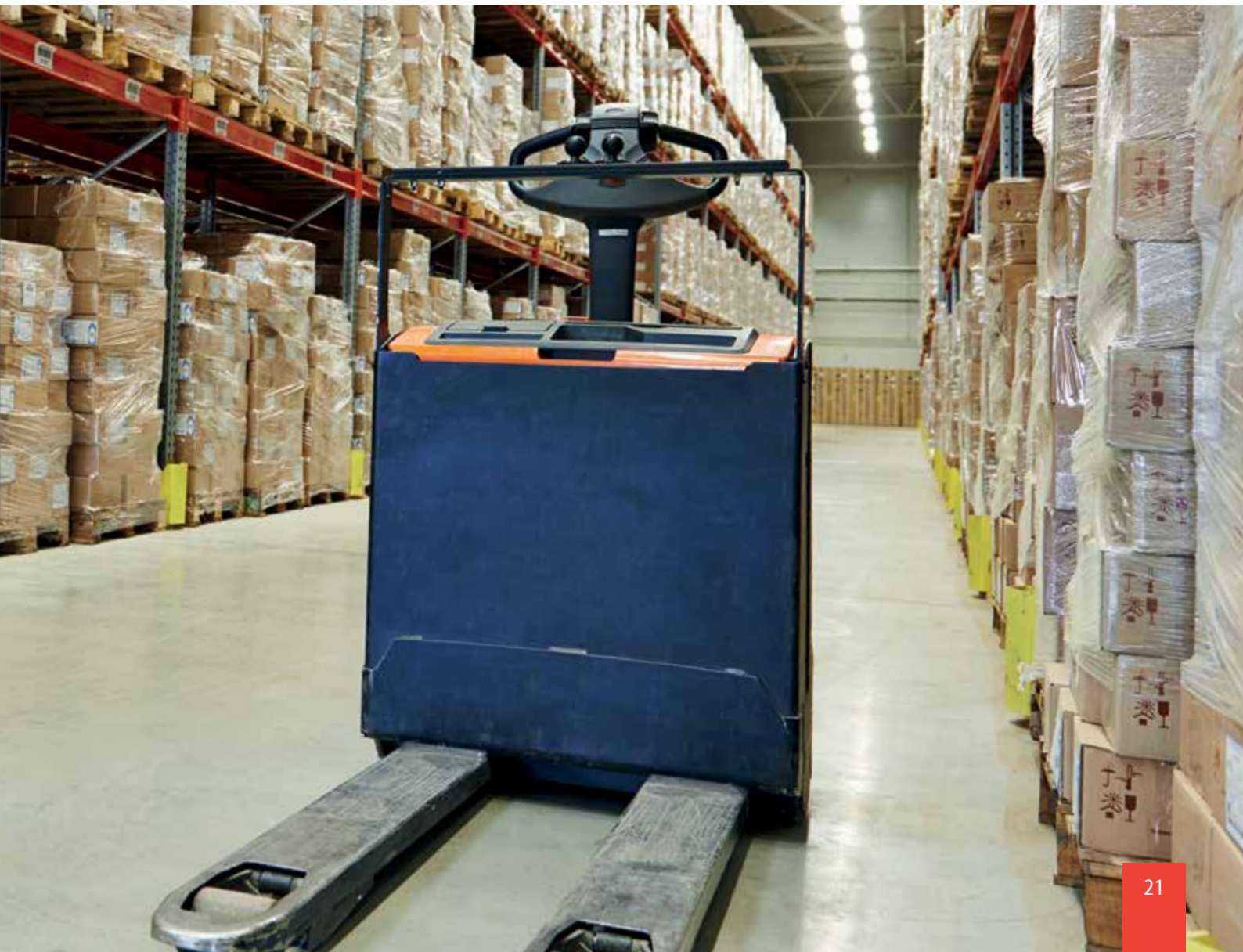


Mast boom lift



Cell Type DIN					
CELLTYPE	Capacity (Ah/5h)	Weight (Kg)	Dimensions (mm)		
			X	Y	H
MDL 2-160L	160	121	624	192	510
MDL 2-180L	180	135	624	192	510
MDL 2-180M	180	138	624	192	570
MDL 2-210M	210	154	624	192	570
MDL 2-210H	210	157	624	192	627
MDL 2-230H	230	166	624	192	627
MDL 2-250H	250	180	624	192	627
MBS2-150	150	125	641	141	549
MBS2-200	200	160	641	141	660

	MDL - MBS block
Application	Standard
Technology	Open Lead-acid
Maintenance	Weekly
Design	Multicell block (24V DIN-B / BS)
Capacity (CS)	130 - 250 Ah
Inter-Cell connections	Welded (internal)
Design life (cycles*)	1500+
Single Point Watering	Optional
Air mixing	NA
Electrolyte level sensor	NA
Charging solution	7 to 12 hrs charging time with HF switching chargers
Energy pack charger	Midatron HF
BMU module	Optional
Battery Change Solutions	YES



Traction batteries

GEL - PZV

Maintenance-free traction cells with positive tubular plates.

Our maintenance-free sealed-type GEL battery is ideal for food, pharmaceutical, and chemical industries where hygiene standards are essential.

The ideal solution for hygiene-sensitive product storage facilities, where gas emissions must be minimum and liquid acid must be absent. Ideal for storage areas with limited charging space or where maintenance is difficult. The GEL batteries have zero maintenance costs as they don't require any water topping up.

The bayonet design of the valve ensures better sealing of cells. Lids with increased thickness ensure the robustness of the cell against the developed operating pressure. Vacuum GEL Filling process ensures that no gas is trapped between and inside the plates.

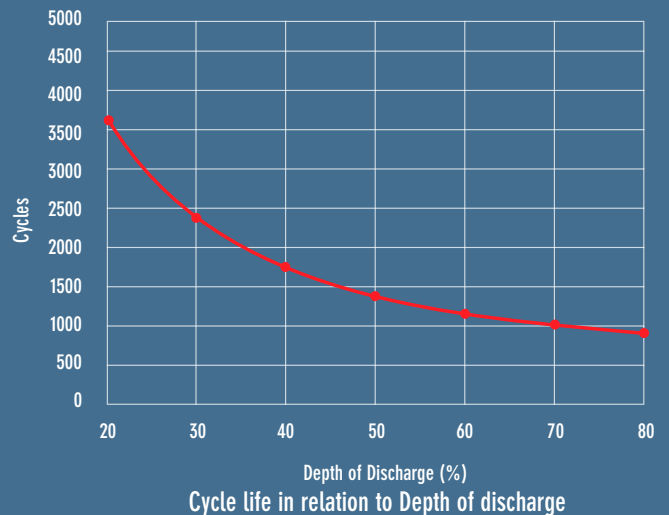


Attention: the charger must be adapted to gel PzV charging profile. We recommend 12h charging. For 8 hours charging, the capacity should not exceed 600-650 Ah for 24V, 350 Ah for 48V or 200 Ah for 80V batteries.

BENEFITS

- Minimized maintenance costs
- No water topping up required
- High Performance: tubular plate design ideal for deep cycling loads
- Minimum gas emission
- Low ventilation requirements
- Safe to use
- User and environmental friendly: no acid leakage, no danger for corrosion and contamination.
- Long lifetime: GEL electrolyte prevents acid stratification & there is no development of high temperatures.
- Flexibility and interchangeability: DIN and BS standards, safe and easy switch from PzS to PzV battery. Provided that the charging profile is suitable for PzV.

SERVICE LIFE: 1200 CYCLES DOD 60%



APPLICATIONS



Forklifts



Industrial cleaning machines



Food industry



Pallet jack



Pharma & chemical industry



Cell Type DIN						
CELL TYPE	Capacity (Ah/5h)	Weight (Kg)	Dimensions (mm)			
			X	Y	H	h
2 EPzV 120	120	9,6	47	198	370	343
3 EPzV 180	180	13,2	65	198	370	343
4 EPzV 240	240	16,8	83	198	370	343
5 EPzV 300	300	20,1	101	198	370	343
6 EPzV 360	360	24,0	119	198	370	343
7 EPzV 420	420	27,7	137	198	370	343
8 EPzV 480	480	31,4	155	198	370	343
2 EPzV 150	150	11,6	47	198	435	408
3 EPzV 150	150	16,0	65	198	435	408
4 EPzV 300	300	20,4	83	198	435	408
5 EPzV 375	375	24,8	101	198	435	408
6 EPzV 450	450	29,3	119	198	435	408
7 EPzV 525	525	33,8	137	198	435	408
8 EPzV 600	600	38,3	155	198	435	408
2 EPzV 170	170	13,5	47	198	505	478
3 EPzV 255	255	18,7	65	198	505	478
4 EPzV 340	340	24,0	83	198	505	478
5 EPzV 425	425	29,2	101	198	505	478
6 EPzV 510	510	34,4	119	198	505	478
7 EPzV 595	595	39,7	137	198	505	478
8 EPzV 680	680	44,9	155	198	505	478
2 EPzV 220	220	16,3	47	198	595	568
3 EPzV 330	330	22,5	65	198	595	568
4 EPzV 440	440	28,8	83	198	595	568
5 EPzV 550	550	35,1	101	198	595	568
6 EPzV 660	660	41,4	119	198	595	568
7 EPzV 770	770	47,8	137	198	595	568
8 EPzV 880	880	54,1	155	198	595	568
2 EPzV 260	260	19,5	47	198	715	688
3 EPzV 390	390	26,9	65	198	715	688
4 EPzV 520	520	34,4	83	198	715	688
5 EPzV 650	650	41,9	101	198	715	688
6 EPzV 780	780	49,4	119	198	715	688
7 EPzV 910	910	57,0	137	198	715	688
8 EPzV 1040	1040	64,5	155	198	715	688
2 EPzV 280	280	20,4	47	198	740	713
3 EPzV 420	420	28,3	65	198	740	713
4 EPzV 560	560	36,2	83	198	740	713
5 EPzV 700	700	44,1	101	198	740	713
6 EPzV 840	840	52,1	119	198	740	713
7 EPzV 980	980	60,1	137	198	740	713
8 EPzV 1120	1120	68,1	155	198	740	713



Cell Type BS						
CELL TYPE	Capacity (Ah/5h)	Weight (Kg)	Dimensions (mm)			
			X	Y	H	h
2 PzVB 140	140	10,6	45	158	541	514
3 PzVB 210	210	14,5	61	158	541	514
4 PzVB 280	280	18,6	77	158	541	514
5 PzVB 350	350	22,6	93	158	541	514
6 PzVB 420	420	26,5	109	158	541	514
7 PzVB 490	490	30,5	125	158	541	514
8 PzVB 560	560	34,5	141	158	541	514
2 PzVB 170	170	12,8	45	158	633	606
3 PzVB 255	255	17,7	61	158	633	606
4 PzVB 340	340	22,5	77	158	633	606
5 PzVB 425	425	27,3	93	158	633	606
6 PzVB 510	510	32,1	109	158	633	606
7 PzVB 595	595	36,9	125	158	633	606
8 PzVB 680	680	41,9	141	158	633	606

Traction batteries

LOW MAINTENANCE - LM

With proven PzS technology using tubular plates in combination with an adjusted charging regime results in extended watering intervals. Cells are manufactured and tested according to EN60254-1 and IEC254-1.

Low Maintenance 8-series :

- Watering interval : up to 8 weeks
- HF charger (1.10 - 1.11 charging factor)
- Electrolyte level indicator
- Automatic filling system (optional, but recommended)

Low Maintenance 13-series :

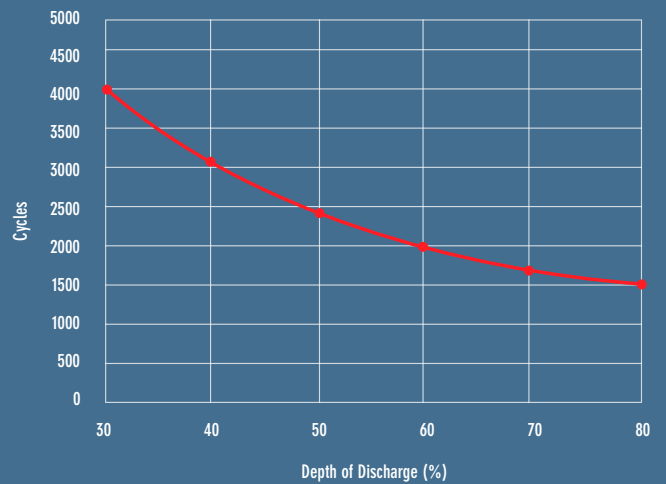
- Watering interval up to 13 weeks
- HF charger + Acid circulation system (1.07 - 1.08 charging factor)
- Electrolyte level indicator
- Automatic filling system (optional, but recommended)



BENEFITS

- Water refill interval is efficiently prolonged
- Reduced water consumption
- Low maintenance and reduced operational costs
- Reduced charging factor
- 50 to 80% reduced gas release and ventilation requirements
- 20 to 30% less charging time
- Cost saving due to lower energy consumption from 10 to 20%
- Reduced operation temperatures

SERVICE LIFE: 1500 CYCLES DOD 80%



Cycle life in relation to Depth of discharge

APPLICATIONS



Forklifts



Industrial cleaning machines



Pallet jack



AGV



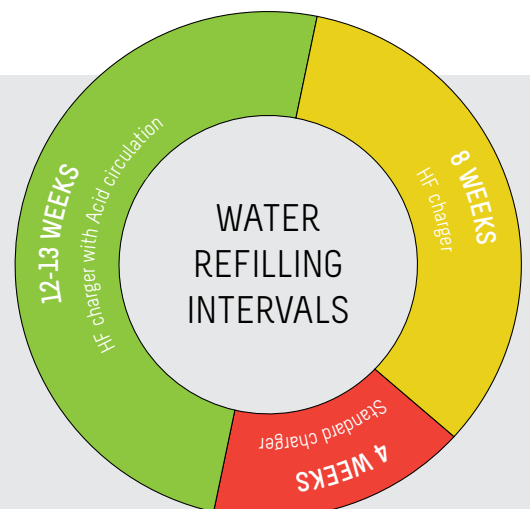
CELL TYPE	Capacity (Ah/5h)	Weight (Kg)	Dimensions (mm)			
			X	Y	H	h
2 PzRM 160	160	10,2	47	198	425	402
3 PzRM 240	240	14,5	65	198	425	402
4 PzRM 320	320	18,7	83	198	425	402
5 PzRM 400	400	22,9	101	198	425	402
6 PzRM 480	480	27,1	119	198	425	402
7 PzRM 560	560	31,3	137	198	425	402
8 PzRM 640	640	35,5	155	198	425	402
9 PzRM 720	720	39,7	173	198	425	402
10 PzRM 800	800	43,9	191	198	425	402
12 PzRM 960	960	52,6	227	198	425	402
2 PzRM 180	180	11,6	47	198	495	472
3 PzRM 270	270	16,6	65	198	495	472
4 PzRM 360	360	21,4	83	198	495	472
5 PzRM 450	450	26,2	101	198	495	472
6 PzRM 540	540	31,0	119	198	495	472
7 PzRM 630	630	35,8	137	198	495	472
8 PzRM 720	720	40,6	155	198	495	472
9 PzRM 810	810	45,4	173	198	495	472
10 PzRM 900	900	50,2	191	198	495	472
12 PzRM 1080	1080	60,1	227	198	495	472
2 PzRM 210	210	13,3	47	198	538	515
3 PzRM 315	315	18,3	65	198	538	515
4 PzRM 420	420	23,7	83	198	538	515
5 PzRM 525	525	29,1	101	198	538	515
6 PzRM 630	630	34,5	119	198	538	515
7 PzRM 735	735	39,9	137	198	538	515
8 PzRM 840	840	45,3	155	198	538	515
9 PzRM 945	945	50,7	173	198	538	515
10 PzRM 1050	1050	56,4	191	198	538	515
12 PzRM 1260	1260	67,2	227	198	538	515
2 PzRM 230	230	14,0	47	198	568	545
3 PzRM 345	345	19,5	65	198	568	545
4 PzRM 460	460	25,0	83	198	568	545
5 PzRM 575	575	30,6	101	198	568	545
6 PzRM 690	690	36,2	119	198	568	545
7 PzRM 805	805	41,8	137	198	568	545
8 PzRM 920	920	47,4	155	198	568	545
9 PzRM 1035	1035	53,2	173	198	568	545
10 PzRM 1150	1150	58,9	191	198	568	545
12 PzRM 1380	1380	70,1	227	198	568	545



CELL TYPE	Capacity (Ah/5h)	Weight (Kg)	Dimensions (mm)			
			X	Y	H	h
2 PzRM 250	250	14,5	47	198	593	570
3 PzRM 375	375	20,5	65	198	593	570
4 PzRM 500	500	26,5	83	198	593	570
5 PzRM 625	625	32,5	101	198	593	570
6 PzRM 750	750	38,5	119	198	593	570
7 PzRM 875	875	44,5	137	198	593	570
8 PzRM 1000	1000	50,5	155	198	593	570
9 PzRM 1125	1125	56,8	173	198	593	570
10 PzRM 1250	1250	62,8	191	198	593	570
12 PzRM 1500	1500	74,8	227	198	593	570
2 PzRM 280	280	18,5	47	198	709	686
3 PzRM 420	420	25,3	65	198	709	686
4 PzRM 560	560	32,2	83	198	709	686
5 PzRM 700	700	39,5	101	198	709	686
6 PzRM 840	840	46,7	119	198	709	686
7 PzRM 980	980	54,0	137	198	709	686
8 PzRM 1120	1120	61,2	155	198	709	686
9 PzRM 1260	1260	68,8	173	198	709	686
10 PzRM 1400	1400	76,0	191	198	709	686
12 PzRM 1680	1680	90,5	227	198	709	686
2 PzRM 310	310	18,8	47	198	743	720
3 PzRM 465	465	26,1	65	198	743	720
4 PzRM 620	620	33,5	83	198	743	720
5 PzRM 775	775	41,1	101	198	743	720
6 PzRM 930	930	48,9	119	198	743	720
7 PzRM 1085	1085	56,7	137	198	743	720
8 PzRM 1240	1240	64,5	155	198	743	720
9 PzRM 1395	1395	72,8	173	198	743	720
10 PzRM 1550	1550	80,6	191	198	743	720
12 PzRM 1860	1860	96,2	227	198	743	720

LM	4-series	8-series	12-13-series
Refilling intervals in weeks	4	8	12-13
Charger	50 Hz	HF	HF + Acid circulation
Charging factor	1.2	1.10 - 1.11	1.07 - 1.08
Electrolyte level indicator	Serial	Serial	Serial
Central Water filling system	Optional	Optional	Optional
Acid circulation	Optional	Optional	Serial

Condition: water refilling intervals are based on 80% DOD - 1 cycle per day, 5 days per week.



Traction batteries

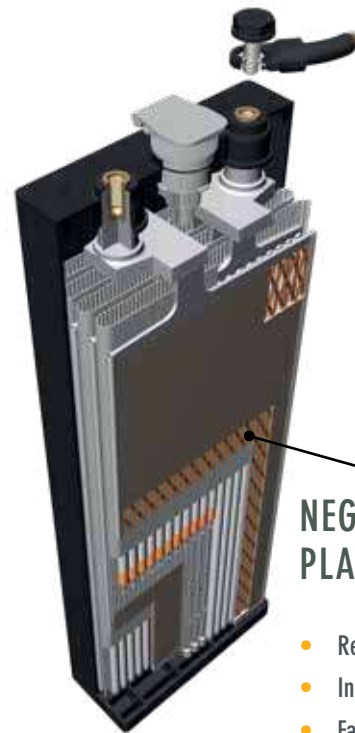
COPPER STRETCH METAL - CSM

With the Copper Stretch Metal battery, the negative grid plate consists entirely of copper.

Copper has a better electrical conductivity which is 10 x higher than lead!

The Copper Stretch Metal technology can work under extreme temperatures.

Thanks to its higher energy content, it can offer longer operating times. The CSM battery can be charged quickly thanks to its low internal resistance. This gives the battery a longer service life than standard batteries.



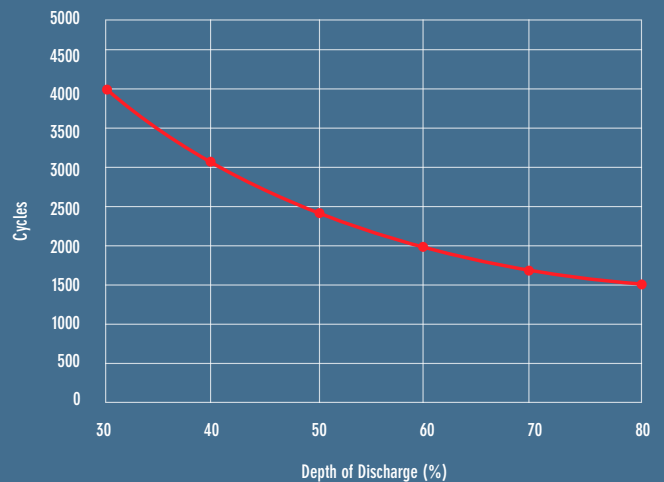
NEGATIVE COPPER PLATE

- Reduced internal resistance
- Increased current flow
- Fast & Opportunity charging

BENEFITS

- 2 Shift operation with opportunity charging in combination with acid circulation = less battery changes - more autonomy - increased lifetime
- Lower Internal Resistance (-15%)
- Higher Energy Efficiency, both when charging and discharging
- Higher Energy Content (longer working shift)
- Increased Capacity
- Better charge acceptance - reduced heat development & energy loss - longer service life
- Fast and opportunity charging (intermediate charge)
- This exceptional battery comes in the color RAL 3001

SERVICE LIFE: 1500 CYCLES DOD 80%



Cycle life in relation to Depth of discharge

APPLICATIONS



Heavy-duty applications



Forklift high-rack (12m)



Pallet jack



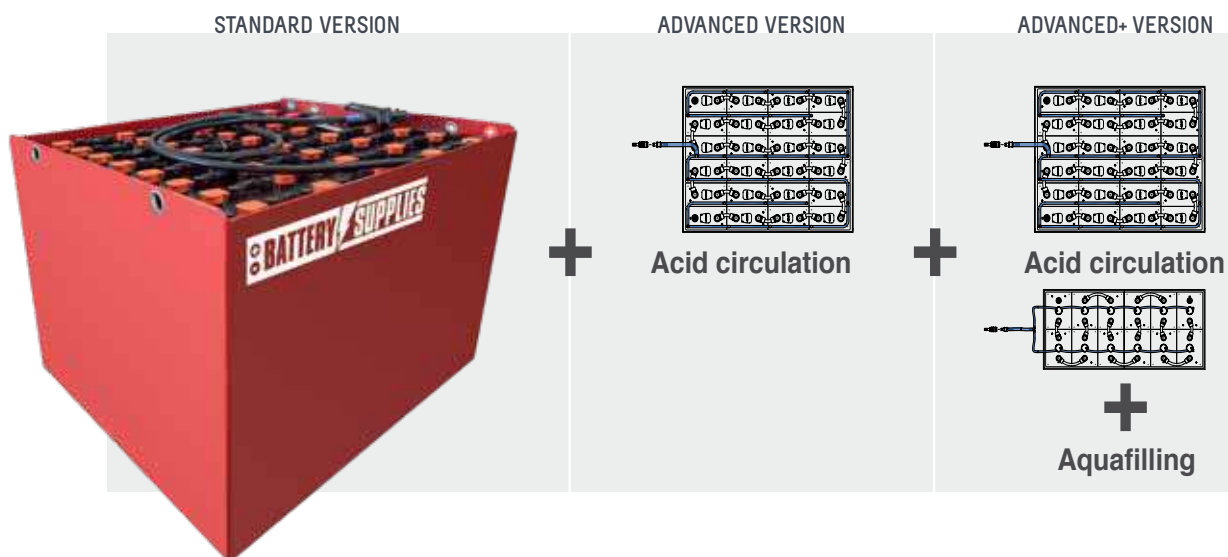
AGV



Cold storage

Available versions

Features	Standard version	Advanced version	Advanced+ version
Acid circulation	no	yes	yes
Aquafilling	no	no	yes
Fast charging	no	yes	yes
Operating time	+5%	+5%	+5%
Energy content	higher	higher	higher
Internal resistance	up to -15%	up to -15%	up to -15%
Refill time	normal	normal	up to 5 times faster



CELL TYPE	Capacity (Ah/5h)	Dimensions (mm)		
		X	Y	H
24V				
2 CSM 260	260	827	162	627
2 CSM 260	260	621	209	627
3 CSM 390	390	827	216	627
3 CSM 390	390	621	281	627
4 CSM 520	520	827	270	627
5 CSM 650	650	827	324	627
6 CSM 780	780	827	378	627
8 CSM 1040	1040	827	486	627
3 CSM 480	480	832	220	784
3 CSM 480	480	625	285	784
5 CSM 800	800	832	328	784
48V				
3 CSM 390	390	827	411	627
3 CSM 390	390	1.027	346	627
4 CSM 520	520	827	519	627
4 CSM 520	520	1.027	436	627
5 CSM 650	650	827	627	627
5 CSM 650	650	1.027	526	627
6 CSM 780	780	827	735	627
6 CSM 780	780	1.027	616	627



CELL TYPE	Capacity (Ah/5h)	Dimensions (mm)		
		X	Y	H
3 CSM 480	480	832	415	784
3 CSM 480	480	1.032	440	784
3 CSM 480	480	1.220	280	784
4 CSM 640	640	832	523	784
4 CSM 640	640	1.032	440	784
4 CSM 640	640	1.220	352	784
5 CSM 800	800	832	631	784
5 CSM 800	800	1.032	530	784
5 CSM 800	800	1.220	424	784
6 CSM 960	960	1.032	620	784
6 CSM 960	960	1.220	496	784
80V				
3 CSM 390	390	1.023	561	627
4 CSM 520	520	1.023	705	627
5 CSM 650	650	1.023	849	627
6 CSM 780	780	1.023	993	627
3 CSM 480	480	1.025	564	784
4 CSM 640	640	1.025	708	784
5 CSM 800	800	1.025	852	784
6 CSM 960	960	1.025	996	784

* Only available as a complete battery, other dimensions on request. Colour of the container: RAL 3001 .

Traction batteries

SQUARE - PSQ

SQUARE batteries are designed to deliver more power and longer run time comparing to conventional lead-acid batteries and are the perfect choice to meet the needs of heavy-duty applications.

SQUARE POSITIVE TUBULAR PLATE design allows more active material surface area to be exposed to electrolyte with higher specific gravity which leads to increased power and prolonged run time of the battery compared to conventional lead-acid batteries with round tube design.

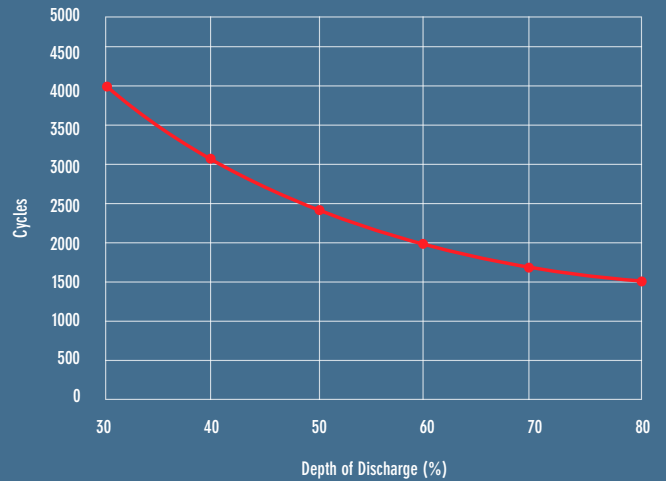
Prolonged run time on each battery charge means fewer battery change required and less need of spare batteries.



BENEFITS

- Suitable for heavy-duty applications
- Increased capacity in standard cell design/volume
- More active material on positive plates
- More power due to bigger plate surface compared to standard round tube design
- More positive active material surface area exposed to electrolyte with higher specific gravity
- Plates can sustain higher levels of voltage throughout the discharge cycle
- Higher robustness of the plates
- Prolonged run time of the forklift within one cycle –fewer spare batteries needed
- Special chargers equipped with faster customized charging profiles also allow opportunity charging
- The chargers with specific charge curves allow to charge faster and to make intermediate charges PzSQ charge with 20A/100Ah (Standard PzS: 16A/100Ah)
- Prolonged cycle life based on robust plate construction

SERVICE LIFE: 1500 CYCLES DOD 80%



Cycle life in relation to Depth of discharge

APPLICATIONS



Heavy-duty applications

Forklift high-rack (12m)



Cell Type DIN							
CELL TYPE	Capacity (Ah/Sh)	Weight (Kg)		Dimensions (mm)			
		Dry	Filled	X	Y	H	h
2 PSQ 280	280	15,5	12,4	47	198	593	570
3 PSQ 420	420	21,9	17,4	65	198	593	570
4 PSQ 560	560	28,4	22,6	83	198	593	570
5 PSQ 700	700	35,0	27,9	101	198	593	570
6 PSQ 840	840	41,5	33,1	119	198	593	570
7 PSQ 980	980	48,1	38,4	137	198	593	570
8 PSQ 1120	1120	54,6	43,6	155	198	593	570
9 PSQ 1260	1260	61,6	49,3	173	198	593	570
10 PSQ 1400	1400	68,1	54,5	191	198	593	570
12 PSQ 1680	1680	81,2	65,0	227	198	593	570
2 PSQ 340	340	22,4	15,8	47	198	743	720
3 PSQ 510	510	27,4	21,8	65	198	743	720
4 PSQ 680	680	35,1	28,3	83	198	743	720
5 PSQ 850	850	43,1	34,8	101	198	743	720
6 PSQ 1020	1020	51,2	41,3	119	198	743	720
7 PSQ 1190	1190	59,4	47,8	137	198	743	720
8 PSQ 1360	1360	67,5	54,3	155	198	743	720
9 PSQ 1530	1530	76,4	61,4	173	198	743	720
10 PSQ 1700	1700	84,5	67,9	191	198	743	720
12 PSQ 2040	2040	100,8	80,8	227	198	743	720



□ SQUARE POSITIVE TUBULAR PLATE

4 Poles

STANDARD:
CENTRAL WATER
FILLING SYSTEM



STANDARD:
ACID
CIRCULATION



STANDARD:
ELECTROLYTE
LEVEL SENSOR



OPTIONAL:
DATALOGGER



Traction batteries

EX-PROOF

The Ex-proof batteries are produced in accordance with the directive 2014/34/EU in IECEx certification scheme and fulfill the applicable requirements of directive harmonized standards EN/IEC 60079-0, 60079-7 and 60079-31.

The cable connection ends are protected by a connection system of certified type according to one of the type of protection intended by the ATEX and IECEx, respectively for group I and group II. Moreover, in case of use in uni-polar or bipolar connectors, these are non-interchangeable.

All accessories used, must be certified according to IEC 60079-0, IEC 60079-7 and IEC 60079-31 Standards.



TECHNICAL DATA

- Maximum voltage: from 12 to 400V
- Maximum power: 155kW
- Maximum cell's capacity: 46 to 1860 Ah
- Maximum discharge current: 0,2 x cell's capacity C5
- Type of protection: "e" "tb"
- Ambient temperature: from -20°C to 40 °C
- Electrolyte density by 30°C: 1,29 ± 0,01 kg/L.
- Weight tolerance is ± 5%

ACCESSORIES

CELL CONNECTORS - in combination with the cell terminal and screw - this system offers the highest safety. Connection to the cells is via female threaded inserts secured with metallic bolts with insulated covers, which maintain the minimum ingress protection level of IP 64 required for Zone 21 (dust).

WATER FILLING SYSTEM - optional water refilling system built on batteries is used to automatically maintain the nominal electrolyte levels. The battery should be topped up after completion of a full charge with water with conductance below 30µS/cm.

ELECTROLYTE CIRCULATION SYSTEM - this optional system is recommended for heavy-duty use, short charge times, boost or opportunity charging and in high ambient temperatures. The system reduces water consumption, working temperatures and a charge factor, prevents the stratification of the electrolyte and reduces charging time.

APPLICATIONS



Mining



Pharma & chemical industry



Petro-chemistry

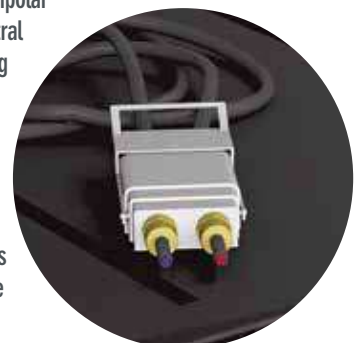


Storage depot

CONNECTORS

Flameproof connector consist of a female bipolar plug and of a male bipolar socket. The central special pin prevents the not correct coupling and the reversal of the poles.

The connection with the electrical circuits is realized by certified ATEX and IECEx (depending on request) Ex-d cable glands for armored or not-armored cable. The kit is completed by a non-flameproof plug for the recharging system.



DIN - PZS



CELL TYPE	Capacity (Ah/5h)	Weight (kg)		Dimensions (mm)			
		Dry	Filled	X	Y	H	h
2 PzS 100	100	5,7	6,8	47	198	305	282
3 PzS 150	150	7,7	9,6	65	198	305	282
4 PzS 200	200	9,9	12,4	83	198	305	282
5 PzS 250	250	12,2	15,3	101	198	305	282
6 PzS 300	300	14,5	18,2	119	198	305	282
7 PzS 350	350	16,7	21,1	137	198	305	282
8 PzS 400	400	19,0	24,0	155	198	305	282
9 PzS 450	450	21,3	26,9	173	198	305	282
10 PzS 500	500	23,6	29,8	191	198	305	282
12 PzS 600	600	28,4	35,9	227	198	305	282
2 PzS 120	120	6,5	8,5	47	198	363	340
3 PzS 180	180	9,2	11,9	65	198	363	340
4 PzS 240	240	11,9	15,4	83	198	363	340
5 PzS 300	300	14,6	18,9	101	198	363	340
6 PzS 360	360	17,2	22,4	119	198	363	340
7 PzS 420	420	19,9	25,9	137	198	363	340
8 PzS 480	480	22,6	29,4	155	198	363	340
9 PzS 540	540	25,2	32,9	173	198	363	340
10 PzS 600	600	27,9	36,4	191	198	363	340
12 PzS 720	720	33,6	43,7	227	198	363	340
2 PzS 160	160	8,1	10,2	47	198	425	402
3 PzS 240	240	11,2	14,5	65	198	425	402
4 PzS 320	320	14,6	18,7	83	198	425	402
5 PzS 400	400	17,9	22,9	101	198	425	402
6 PzS 480	480	21,3	27,1	119	198	425	402
7 PzS 560	560	24,7	31,3	137	198	425	402
8 PzS 640	640	28,0	35,5	155	198	425	402
9 PzS 720	720	31,4	39,7	173	198	425	402
10 PzS 800	800	34,7	43,9	191	198	425	402
12 PzS 960	960	41,8	52,6	227	198	425	402
2 PzS 180	180	9,1	11,6	47	198	495	472
3 PzS 270	270	12,8	16,6	65	198	495	472
4 PzS 360	360	16,6	21,4	83	198	495	472
5 PzS 450	450	20,5	26,2	101	198	495	472
6 PzS 540	540	24,4	31,0	119	198	495	472
7 PzS 630	630	28,2	35,8	137	198	495	472
8 PzS 720	720	32,1	40,6	155	198	495	472
9 PzS 810	810	35,9	45,4	173	198	495	472
10 PzS 900	900	39,8	50,2	191	198	495	472
12 PzS 1080	1080	47,8	60,1	227	198	495	472
2 PzS 210	210	10,3	13,3	47	198	538	515
3 PzS 315	315	14,4	18,3	65	198	538	515
4 PzS 420	420	18,6	23,7	83	198	538	515
5 PzS 525	525	22,9	29,1	101	198	538	515
6 PzS 630	630	27,1	34,5	119	198	538	515
7 PzS 735	735	31,4	39,9	137	198	538	515
8 PzS 840	840	35,6	45,3	155	198	538	515
9 PzS 945	945	39,9	50,7	173	198	538	515
10 PzS 1050	1050	44,5	56,4	191	198	538	515
12 PzS 1260	1260	53,0	67,2	227	198	538	515



CELL TYPE	Capacity (Ah/5h)	Weight (kg)		Dimensions (mm)			
		Dry	Filled	X	Y	H	h
2 PzS 230	230	10,8	14,0	47	198	568	545
3 PzS 345	345	15,3	19,8	65	198	568	545
4 PzS 460	460	19,9	25,6	83	198	568	545
5 PzS 575	575	24,8	31,4	101	198	568	545
6 PzS 690	690	29,6	37,2	119	198	568	545
7 PzS 805	805	34,5	43,0	137	198	568	545
8 PzS 920	920	39,3	48,8	155	198	568	545
9 PzS 1035	1035	44,5	54,9	173	198	568	545
10 PzS 1150	1150	49,3	60,7	191	198	568	545
12 PzS 1380	1380	59,0	72,3	227	198	568	545
2 PzS 250	250	11,6	14,7	47	198	593	570
3 PzS 375	375	16,2	20,7	65	198	593	570
4 PzS 500	500	21,1	26,9	83	198	593	570
5 PzS 625	625	26,0	33,1	101	198	593	570
6 PzS 750	750	30,9	39,3	119	198	593	570
7 PzS 875	875	35,8	45,5	137	198	593	570
8 PzS 1000	1000	40,7	51,7	155	198	593	570
9 PzS 1125	1125	45,9	58,2	173	198	593	570
10 PzS 1250	1250	50,8	64,4	191	198	593	570
12 PzS 1500	1500	60,6	76,8	227	198	593	570
2 PzS 280	280	14,4	18,3	47	198	709	686
3 PzS 420	420	19,4	25,3	65	198	709	686
4 PzS 560	560	25,1	32,2	83	198	709	686
5 PzS 700	700	30,9	39,5	101	198	709	686
6 PzS 840	840	36,6	46,7	119	198	709	686
7 PzS 980	980	42,3	54,0	137	198	709	686
8 PzS 1120	1120	48,0	61,2	155	198	709	686
9 PzS 1260	1260	54,1	68,8	173	198	709	686
10 PzS 1400	1400	59,8	76,0	191	198	709	686
12 PzS 1680	1680	71,3	90,5	227	198	709	686
2 PzS 310	310	14,9	18,8	47	198	743	720
3 PzS 465	465	20,6	26,1	65	198	743	720
4 PzS 620	620	26,7	33,5	83	198	743	720
5 PzS 775	775	32,9	41,1	101	198	743	720
6 PzS 930	930	39,0	48,9	119	198	743	720
7 PzS 1085	1085	45,1	56,7	137	198	743	720
8 PzS 1240	1240	51,3	64,5	155	198	743	720
9 PzS 1395	1395	57,8	72,8	173	198	743	720
10 PzS 1550	1550	64,0	80,6	191	198	743	720
12 PzS 1860	1860	76,2	96,2	227	198	743	720

BS - PZB



CELL TYPE	Capacity (Ah/5h)	Weight (kg)		Dimensions (mm)			
		Dry	Filled	X	Y	H	h
2PzB46	46	3,0	3,7	45	157,5	240	216
3PzB69	69	4,2	5,4	61	157,5	240	216
4PzB92	92	5,4	6,9	77	157,5	240	216
5PzB115	115	6,6	8,4	93	157,5	240	216
6PzB138	138	7,8	10,0	109	157,5	240	216
7PzB161	161	9,0	11,6	125	157,5	240	216
8PzB184	184	10,2	13,2	141	157,5	240	216
9Pzb207	207	11,9	15,3	157	157,5	240	216
10PzB230	230	13,1	16,9	173	157,5	240	216
11PzB253	253	14,3	18,4	189	157,5	240	216
2PzB64	64	4,0	5,1	45	157,5	284	260
3PzB96	96	5,6	7,1	61	157,5	284	260
4PzB128	128	7,2	9,2	77	157,5	284	260
5PzB160	160	8,8	11,3	93	157,5	284	260
6PzB192	192	10,3	13,2	109	157,5	284	260
7PzB224	224	11,7	15,0	125	157,5	284	260
8PzB256	256	13,1	16,8	141	157,5	284	260
9PzB288	288	14,9	19,1	157	157,5	284	260
10PzB320	320	16,3	20,9	173	157,5	284	260
11PzB352	352	17,7	22,7	189	157,5	284	260
2PzB84	84	5,4	6,9	45	157,5	350	326
3PzB126	126	7,3	9,4	61	157,5	350	326
4PzB168	168	9,3	11,9	77	157,5	350	326
5PzB210	210	11,3	14,5	93	157,5	350	326
6PzB252	252	13,5	17,3	109	157,5	350	326
7PzB294	294	15,6	20,0	125	157,5	350	326
8PzB336	336	17,6	22,3	141	157,5	350	326
9PzB378	378	19,9	25,2	157	157,5	350	326
10PzB420	420	21,8	27,6	173	157,5	350	326
11PzB462	462	23,7	30,0	189	157,5	350	326
2PzB110	110	6,1	7,6	45	157,5	423	399
3PzB165	165	8,5	10,5	61	157,5	423	399
4PzB220	220	11,0	13,5	77	157,5	423	399
5PzB275	275	13,5	16,5	93	157,5	423	399
6PzB330	330	15,9	19,6	109	157,5	423	399
7PzB385	385	18,4	22,6	125	157,5	423	399
8PzB440	440	20,8	25,6	141	157,5	423	399
9PzB495	495	23,8	29,1	157	157,5	423	399
10PzB550	550	26,3	32,1	173	157,5	423	399
11PzB605	605	28,7	35,2	189	157,5	423	399
2PzB130	130	6,8	8,2	45	157,5	477	453
3PzB195	195	10,1	12,0	61	157,5	477	453
4PzB260	260	13,0	15,5	77	157,5	477	453
5PzB325	325	16,0	19,0	93	157,5	477	453
6PzB390	390	18,9	22,6	109	157,5	477	453
7PzB455	455	21,8	26,1	125	157,5	477	453
8PzB520	520	24,5	29,6	141	157,5	477	453
9PzB585	585	27,9	33,6	157	157,5	477	453
10PzB650	650	30,6	37,2	173	157,5	477	453
11PzB715	715	33,3	40,7	189	157,5	477	453
2PzB150	150	7,5	10,0	45	157,5	537	513



CELL TYPE	Capacity (Ah/5h)	Weight (kg)		Dimensions (mm)			
		Dry	Filled	X	Y	H	h
3PzB225	225	10,8	13,9	61	157,5	537	513
4PzB300	300	14,1	17,8	77	157,5	537	513
5PzB375	375	17,5	21,6	93	157,5	537	513
6PzB450	450	20,9	25,6	109	157,5	537	513
7PzB525	525	24,1	29,6	125	157,5	537	513
8PzB600	600	27,4	33,5	141	157,5	537	513
9PzB675	675	31,1	38,2	157	157,5	537	513
10PzB750	750	34,2	42,3	173	157,5	537	513
11PzB825	825	37,3	46,4	189	157,5	537	513
2PzB172	172	8,3	10,7	45	157,5	591	567
3PzB258	258	11,8	15,0	61	157,5	591	567
4PzB344	344	15,2	19,3	77	157,5	591	567
5PzB430	430	18,6	23,7	93	157,5	591	567
6PzB516	516	22,0	28,1	109	157,5	591	567
7PzB602	602	25,4	32,6	125	157,5	591	567
8PzB688	688	28,8	37,1	141	157,5	591	567
9PzB774	774	32,9	42,3	157	157,5	591	567
10PzB860	860	36,3	46,9	173	157,5	591	567
11PzB946	946	39,7	51,4	189	157,5	591	567
2PzB200	200	9,4	11,8	45	157,5	632	608
3PzB300	300	13,5	16,6	61	157,5	632	608
4PzB400	400	17,5	21,5	77	157,5	632	608
5PzB500	500	21,6	26,4	93	157,5	632	608
6PzB600	600	25,6	31,5	109	157,5	632	608
7PzB700	700	29,7	36,4	125	157,5	632	608
8PzB800	800	33,7	41,4	141	157,5	632	608
9PzB900	900	38,6	47,1	157	157,5	632	608
10PzB1000	1000	42,7	52,0	173	157,5	632	608
11PzB1100	1100	46,7	56,9	189	157,5	632	608
2PzB216	216	9,9	13,5	45	157,5	712	688
3PzB324	324	14,3	18,9	61	157,5	712	688
4PzB432	432	18,7	24,3	77	157,5	712	688
5PzB540	540	23,2	29,7	93	157,5	712	688
6PzB648	648	27,6	35,1	109	157,5	712	688
7PzB756	756	32,1	40,5	125	157,5	712	688
8PzB864	864	36,5	45,9	141	157,5	712	688
9PzB972	972	41,6	52,0	157	157,5	712	688
10PzB1080	1080	46,0	57,4	173	157,5	712	688
11PzB1188	1188	50,4	62,8	189	157,5	712	688

GEL - PZV



Cell Type DIN						
CELL TYPE	Capacity (Ah/5h)	Weight (kg)	Dimensions (mm)			
			X	Y	H	h
2 PzV 110	110	9,3	47	198	350	340
3 PzV 165	165	12,7	65	198	350	340
4 PzV 220	220	16,5	83	198	350	340
5 PzV 275	275	20,1	101	198	350	340
6 PzV 330	330	23,8	119	198	350	340
7 PzV 385	385	27,4	137	198	350	340
2 PzV 140	140	10,8	47	198	412	402
3 PzV 210	210	15,5	65	198	412	402
4 PzV 280	280	19,7	83	198	412	402
5 PzV 350	350	24,2	101	198	412	402
6 PzV 420	420	29,1	119	198	412	402
2 PzV 160	160	12,7	47	198	482	472
3 PzV 240	240	18,1	65	198	482	472
4 PzV 320	320	23,6	83	198	482	472
5 PzV 400	400	29,0	101	198	482	472
6 PzV 480	480	35,0	119	198	482	472
2 PzV 200	200	14,7	47	198	573	563
3 PzV 300	300	21,6	65	198	573	563
4 PzV 400	400	27,8	83	198	573	563
5 PzV 500	500	34,3	101	198	573	563
6 PzV 600	600	40,6	119	198	573	563
2 PzV 240	240	19,7	47	198	730	720
3 PzV 360	360	27,4	65	198	730	720
4 PzV 480	480	35,3	83	198	730	720
5 PzV 600	600	42,1	101	198	730	720
6 PzV 720	720	50,0	119	198	730	720



Cell Type BS						
CELL TYPE	Capacity (Ah/5h)	Weight (kg)	Dimensions (mm)			
			X	Y	H	h
2 PzVB 122	122	9,7	45	157,5	486	472
3 PzVB 183	183	13,5	61	157,5	486	472
4 PzVB 244	244	16,9	77	157,5	486	472
2 PzVB 142	142	10,6	45	157,5	530	516
3 PzVB 213	213	14,8	61	157,5	560	516
4 PzVB 284	284	18,5	77	157,5	560	516
2 PzVB 170	170	11,8	45	157,5	625	611
3 PzVB 255	255	16,1	61	157,5	625	611
4 PzVB 340	340	20,7	77	157,5	625	611

IECEX MARKING:

Ex e IIB or IIC T5 Gb
and/or: Ex tb IIIC T100°C Db Ex e I Mb



CERTIFICATES

ATEX Certificate: INERIS 16ATEX0013X
IECEX Certificate: IECEX INE 16.0022X

ATEX MARKING:

For group II and/or group III:

II 2 G

EX e IIB or IIC T5 Gb

II 2 D

Ex tb IIC T100°C Db

For group I:

I M2

Ex e I Mb

Traction batteries

PURE LEAD CARBON

BATTERY SYSTEM FOR ELECTRIC PALLET TRUCKS

AGM THIN PLATE LEAD CARBON

CHARACTERISTICS

- Designed for small traction applications
- Totally maintenance free
- Could be installed in any position (except inverted)
- High energy density
- Opportunity charge design
- Operating temperature range -40°C to +65°C
- Modified electrochemistry delivers high capacity and high power density
- Steel containers
- Optimization for cycling performances (up to 1200 cycles at 60% DoD)
- Available in 12V blocks and assembled batteries to be installed in DIN crates



2S BAT/190FT-C
24V 170Ah/C5



Cell Type DIN						
Reference	Capacity (Ah/C5)	Weight (Kg)	Dimensions (mm)			
			X	Y	H	
2S BAT/190FT-C	170	160	650	220	580	-> framed insert

BENEFITS

- Resistant to extreme low & high temperatures: -40°C to +65°C
- Longer battery life : 3 times more cycles than standard AGM
- Maintenance-free
- Five times faster recharging
- High performance
- Minimal gassing
- Low self-discharge
- PSOC: Partial State Of Charge



APPLICATIONS



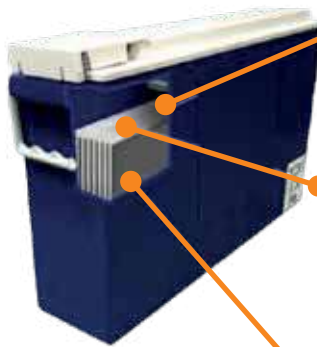
Pallet jack



AGV



Cold storage



Robust Intercell Connections
To prevent vibration, the cell connectors are casted and bonded to the plates.

Compressed AGM Plate Separators
Made for extreme vibration resistance

Pure Lead Plates
Thin Plates constructed from 99% pure lead

Thin plate Pure Lead

- Excellent cycle life time
- Fast recharge
- High Energy throughput
- Space saving

Quicker Recharge after using

Fast Discharge

Buzzer (low SOC)



Discharge meter

Led indicator:
State of charge
Green: 100% charged
Yellow: 80% charged
Red: Start charging

On-board charger
(built-in interlock relay)
No driving while charging



Low Internal Resistance

- Increased charge efficiency/charge acceptance
- Lower energy consumption for battery recharge
- Lower heat generation
- No risk of thermal runaway

PSOC functionality

- Longer life time in hard condition
- Fast recharge
- Opportunity charge

Exposure to high temperature conditions

- Temperature levels from -20 °C to + 45 °C



Traction batteries

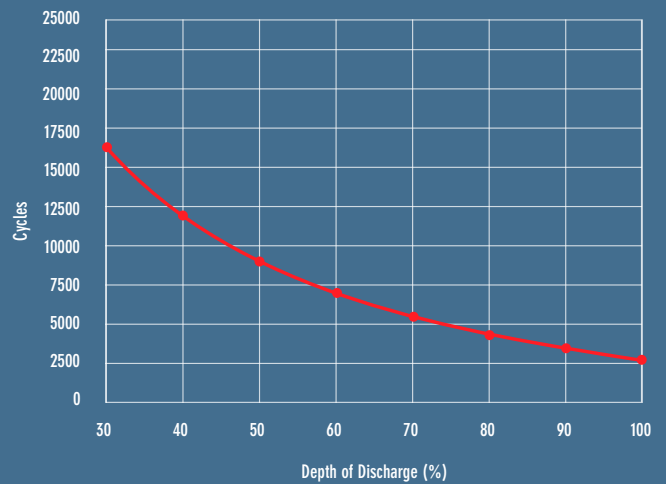
LITHIUM-ION - LIFEPO4



BENEFITS

- Excellent low temperature performance
- High safety performance
- Longer lifespan: up to 4000 cycles
- High energy density
- Outstanding charging, discharging performance
- Lower self-discharging rate
- Maintenance-free
- Zero emission
- Customizations
- Fast & opportunity charging
- Can be mounted in every position

SERVICE LIFE: 4000 CYCLES DOD 80%



Cycle life in relation to Depth of discharge

APPLICATIONS



Forklift



Marine



Solar



Pallet jack



AGV



Access equipment



GSE



Custom made applications



Construction equipment



Agri

AQ-LITH®

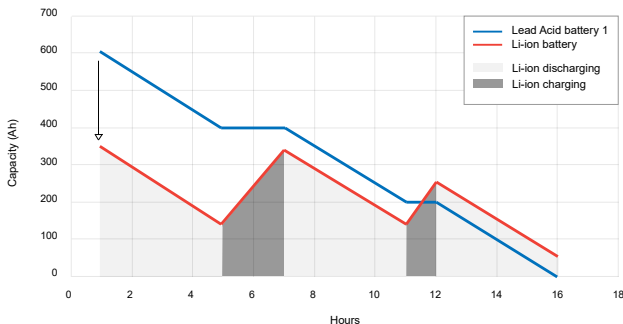


QUICK & OPPORTUNITY CHARGING

A Li-ion battery can be charged whenever you want: during each lunch break, between two operations, etc. A quick charger can charge the battery up to 25% in 30 minutes. A saving of 30% capacity (and thus cost) can be found easily.

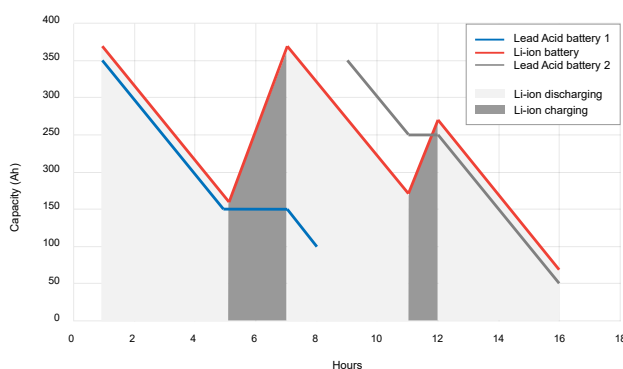
Especially for trucks used in two shifts, the autonomy of a battery is too low. In that case, you need to switch to a 2nd battery after a shift. It takes easily 15 minutes for an operator to replace an acid traction battery. With a Li-ion battery combined with opportunity charging, you can increase the capacity and autonomy for the whole day. This will avoid the investment and maintenance of a 2nd battery and save the time to switch the batteries.

DISCHARGE DURING THE DAY



Compared to traditional lead-acid batteries, a Li-ion battery can be charged very fast. It takes only 2 to 3 hrs for a total charge. Opportunity charging can be done relatively faster. This makes a Li-ion battery a perfect choice for opportunity charging and for transport systems in 24/24 hrs regime (as AGV's).

1 LI-ION BATTERY REPLACES 2 LEAD ACID BATTERIES



MAINTENANCE FREE

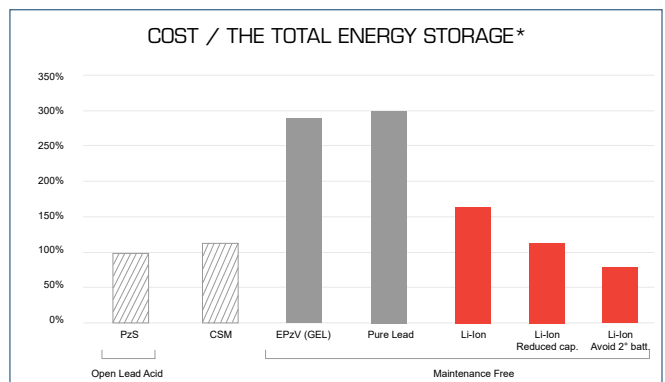
LiFePO4 batteries are fully maintenance-free and can cope with intermediate charging. Intermediate charging – or opportunity charging – leads to battery sulphation, the number one killer of batteries as the acid particles of the electrolyte will attach to the lead plates causing huge internal damage and loss of capacity. However, opportunity charging does not harm lithium-ion batteries.

99% of the early fall-out of acid traction batteries are not due to production faults, but to bad battery handling or bad maintenance: mistakes during watering, intermediate charging, not fully charging the battery after use or leaving the battery in a discharged state, incidents when replacing batteries, etc. The lithium cells inside the LFP battery pack are protected, supervised and balanced by a Battery Management System (BMS). The BMS is basically the heart of the lithium battery system. The BMS prevents all kinds of abuse of the operator.

COST-EFFECTIVENESS

No doubt about it that the purchase of a lead-acid battery is the cheapest solution. The investment of a maintenance-free traction battery of 20 kWh (as gel or pure lead) will be more than double compared to the standard lead-acid battery. The cost of a Li-ion battery can be 4 times more expensive.

However, if you take into account the total energy stored in the battery over its life time, the comparison is totally different. The total storage of energy in a gel and pure-lead battery is limited to the low lifetime expectations (1200 cycles) and the proposed useful capacity (60% DOD) and is about 14 MWh.



* The total energy stored in the battery during its life time = capacity (20 kWh) x expected cycles x DOD%

Traction batteries

LITHIUM-ION - LIFEP04

For Li-ion batteries, the total energy capacity is much higher : $20 \text{ kWh} \times 4000 \text{ cycles} \times 80 \% \text{DOD} = 64 \text{ MWh}$. This makes a Li-ion traction battery the **cheapest maintenance-free battery**.

This price will drop if you take into account the possible reduction of capacity (almost no effect of high discharge currents and low temperatures) and the possibility to avoid a 2° battery (saving in labour).

ZERO EMISSION

Lithium-ion batteries have no emissions during charging. They can be used easily in the food industry. The battery can be charged in a standard room without venting. You don't need to invest in a separate charging room.

EXTRA ADVANTAGES



Lithium-ion batteries have no memory effect.



The energy efficiency (discharged energy/charged energy) for Li-ion batteries is much higher than conventional lead-acid batteries.



Used in low-temperature circumstances, lead-acid batteries lose a lot of capacity. The reduction of capacity for Li-ion batteries is much smaller what makes them very useful for low temperature operations. If you need to charge the battery in freezing conditions, we can install an extra heater into the tray. This heater will be fed by the charger, thus the battery will keep its autonomy.



The AQ-LITH® Lithium BMS has a standard CANbus-connection to allow a perfect control and supervision. The battery will be delivered with a standard CANbus indicator displaying the SOC% (State of Charge) , but also the current, voltage, temperature and warning messages.



The energy density of Li-ion is very high. You can replace a lead-acid battery with a Li-ion battery with the double capacity and the same dimensions.



The Li-ion battery is much lighter than the conventional lead-acid battery, this can give an important saving in the construction and reduces the energy consumption for mobile systems.



High discharge currents reduce seriously the capacity of a lead-acid battery (see Peukert's law). However, the capacity of a Li-ion battery is almost not influenced by high discharge currents.



The internal resistance of a Li-ion battery is very low.



Long cycle life: Up to 4000 cycles @ 80 %DOD

WHY BUY AN AQ-LITH® LI-ION BATTERY?

Based on the long experience with Li-ion, Battery Supplies developed a new generation of Li-ion traction batteries with 2 important advantages:

1. The AQ-LITH® Lithium batteries use prismatic cells based on the superior LiFePO4 (lithium ferrophosphate) technology. This cell offers long cycle life with an excellent energy density. Compared to the NMC technology (lithium nickel manganese cobalt), the LiFePO4 is a lot safer.



In industrial and logistics applications only LiFePO4 is used. It is important to understand that this technology does not ignite or explode, even if the battery breaks down. It is fully protected. The cells are assembled in modules with laserwelded busbars. This connection reduces the internal resistance and reduces the risk of poor connections.

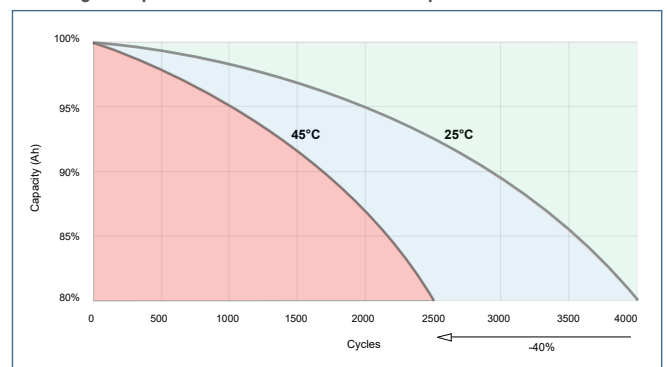
2. The heat dissipation in the cells have a big negative impact on the life time of the battery. Higher temperatures will reduce the lifetime drastically (each °C extra reduces the life time with 2%).

For most Li-ion batteries on the market, the cells and modules are placed together, which will lead to an unstable heat dissipation and local hotspots of the cells. The AQ-LITH® Lithium batteries have an optimal heat balance: the modules are placed to allow an excellent natural venting. This venting will transfer the heat towards the tray and will balance the overall temperature.



Optimal venting

Optionally, the battery can be installed with a forced cooling (airco) for high temperatures or heaters for low temperatures.



AQ-LITH®



STANDARD RANGE OF AQ-LITH® LITHIUM BATTERIES

The AQ-LITH® Lithium batteries are delivered ready-to-use in a tray. In the tray all necessary safety and control components are present as the AQ-LITH® BMS with dynamic balancing.

The standard AQ-LITH® Lithium batteries can be built in the most standard dimensions of lift truck trays. For lift trucks, the weight of the batteries are quite important as contra-weight. In that case extra ballast will be placed in the tray as option to match the same weight as a standard lead-acid battery.

Standard models	Voltage (V)	Capacity (Ah)	Capacity (kWh)	Capacity (kWh net)	Charger: standard charging (4 to 8 hrs)	Charger: fast charging (2 to 3 hrs)
DYN24-210	24	210	5,04	4,032	NG1/24-45 RE-L	NG3/24-95RE-L
DYN24-315	24	315	7,56	6,048	NG1/24-45RE-L	NG9/24-145 RE-L
DYN24-420	24	420	10,08	8,064	NG3/24-60RE-L	NG9+/24-200 RE-L
DYN24-630	24	630	15,12	12,096	NG3/24-95RE-L	NG9+/24-200 RE-L
DYN48-210	48	210	10,08	8,064	NG3/48-45-RE-L	NG7/48-120RE-L
DYN48-315	48	315	15,12	12,096	NG3/48-60RE-L	NG9+/48-160RE-L
DYN48-420	48	420	20,16	16,128	NG5/48-95RE-L	NG9+/48-160RE-L
DYN48-630	48	630	30,24	24,192	NG7/48-120RE-L	MG18/48-320RE-L
DYN48-840	48	840	40,32	32,256	NG7/48-120RE-L	MG27/48-480RE-L
DYN80-210	80	210	16,8	13,44	NG3/80-30RE-L	NG9+/80-120RE-L
DYN80-315	80	315	25,2	20,16	NG5/80-60RE-L	NG9+/80-120RE-L
DYN80-420	80	420	33,6	26,88	NG7/80-75RE-L	MG18/80-200RE-L
DYN80-630	80	630	50,4	40,32	NG9/80-100RE-L	MG27/80-300RE-L
DYN80-840	80	840	67,2	53,76	NG9+/80-120RE-L	MG36/80-400RE-L



Canbus indicator: BAT/48769
 Ideal for all M+ and AQ-LITH® traction batteries. This indicator reads the CANBUS signals from the BMS and displays the SOC, voltage, current, temperature and all warnings.
 With potential-free contact for minimum State of Charge (adjustable)

For all models:
 Discharge current nom 1C max
 Discharge current peak (3s) 3C max
 Charge current 0,5C max
 Temperature for charging 0 to 40°C
 Optional : with heating - 20 to 40°C
 Temperature for discharging - 20 to 50°C

! CUSTOM MADE AQ-LITH® LITHIUM BATTERIES

If the standard batteries don't fit for your application, then we can assemble a custom-made AQ-LITH® Lithium battery based on your specifications. Please send us your parameters as dimensions, voltage, capacity and required current and we will develop the right solution.

Please contact info@batterysupplies.be



Pallet Truck batteries

LITHIUM-ION - LIFEPO4 - PALLET TRUCK BATTERIES



FOR HIGH DEMANDING APPLICATIONS. MADE UPON YOUR DEMAND!

AQ-LITH® LIT/DYN BATTERIES

Developed and assembled by Battery Supplies

- The tray fits perfectly in the machine without need of filler material
- Extra weight is included in the bottom of the battery tray if this is required for ballast. No need to add extra weight in the machine.

Premium quality with high expected cycle life

Canbus communication to charger to allow a perfect charging profile and balancing action.



Ref.	Voltage (V)	Capacity (Ah)	Capacity (kWh)	Capacity (kWh net)	Charger: standard charging (4 to 8 hrs)	Charger: fast charging (2 to 3 hrs)
DYN24-210	24	210	5,04	4,032	NG1/24-45 RE-L	NG3/24-95RE-L
DYN24-315	24	315	7,56	6,048	NG1/24-45RE-L	NG9/24-145 RE-L

THE BATTERY IS SUPPLIED WITH:

- Battery connector (to be specified)
- (external) LED screen: Voltage, Temp., RSOC, Current
- Drive protection between machine and charger
- Charger (standard not included): efficiency > 90%
- Compatible with Zivan chargers both for fast charging and night charging

ADVANTAGES

- 100% Maintenance Free
- Opportunity charging = no need to have exchange battery
- Can be charged in 2 hours (with adapted charger)
- No acid or hydrogen gasses
- Expected lifetime: up to 4000 cycles

APPLICATIONS



Pallet jack

Suitable for following types:

BT	645x196x570h	24V 160 - 165Ah/c5
BT	645x245x570h	24V 210 - 225Ah/c5
JUNGHEINRICH	624x212x573h	24v 180Ah/c5
JUNGHEINRICH	624x212x627h	24v 250Ah/c5
LINDE	624x284x537h	24V 270Ah/c5
LINDE	786x210x630h	24V 375Ah/c5
LINDE	624x212x627h	24V 250Ah/c5
LINDE	624x212x537h	24V 180Ah/c5
LINDE	624x284x627h	24V 375Ah/c5
STILL	624x284x627h	24V 375Ah/c5
STILL	624x284x627h	24V 250Ah/c5
STILL	624x284x627h	24V 200Ah/c5
...		



AQ-LITH® INSERT BATTERIES

ECONOMICAL SOLUTION

ADVANTAGES

- Delivery time: in stock
- Economical solution
- Can resist high currents: use of contactors instead MOSFET
- INSERT battery: we reduced the dimensions of the battery to a minimum. Doing so, this battery fits in mostly all pallet jacks, even if the width is limited.



SPECIFICATIONS

- Battery excl spacers and ballast plates
- 4 options: in 100Ah or 200Ah, with built-in charger or without charger
- With internal fuse and precharge contactor
- With remote control box with start/stop button, buzzer and display.
- With autosleep function to increase autonomy of the battery
- Perfect replacement of standard lead-acid batteries. if you want to replace a Li-ion battery, then please take care as some machines need a special canbus-communication with the battery. Please contact us

Ref.	LIT/INS24-100	LIT/INS24-100C	LIT/INS24-200	LIT/INS24-200C
	24V 100Ah	24V 100Ah with charger	24V 200Ah	24V 200Ah with charger
Battery specifications				
Technology	LFP	LFP	LFP	LFP
Type of cell	prismatic	prismatic	prismatic	prismatic
Nominal voltage (V)	25,6	25,6	25,6	25,6
Max continuous charging current	0,5C	0,5C	0,5C	0,5C
Max continuous discharging current	0,5C	0,5C	0,5C	0,5C
Max discharging current during 10s	2,5C	2,5C	2,5C	2,5C
Operating temp during charge	0 °C to 45 °C	0 °C to 45 °C	0 °C to 45 °C	0 °C to 45 °C
Operating temp during discharge	-20 °C to 50 °C	-20 °C to 50 °C	-20 °C to 50 °C	-20 °C to 50 °C
IP	IP20	IP20	IP20	IP20
Dimensions (W x L x H, mm)	130 x 450 x 500	130 x 450 x 570	190 x 550 x 500	190 x 550 x 569
Weight (kg)	42	45	62	67
Charging cable	1,1 m - REMA 160A	1ph 220V / 1,5m	1 m - REMA 160A	1ph 220V / 1,5m
Discharging cable	1,1 m - REMA 160A	1,1 m - REMA 160A	1,1 m - REMA 160A	1,1 m - REMA 160A
Charger profile	CCCV	CCCV	CCCV	CCCV
Expected life time (cycles or years)	2000 cycles	2000 cycles	2000 cycles	2000 cycles
Warranty	3 years with 80% EOL	3 years with 80% EOL	3 years with 80% EOL	3 years with 80% EOL
Ref. separate charger	LAD/INS24-30		LAD/INS24-45	
Charger specifications				
Voltage in (VAC)	220		220	
Monopase	yes		yes	
Current in (A)	7		10	
Voltage out (V DC nominal)	25,6		25,6	
Profile	CCCV		CCCV	
Current out (A)	30		45	

Lithium-Ion batteries

OVERVIEW



Battery Supplies NV/SA has been investigating the possibilities of lithium in the aftermarkets for more than ten years.

This has led to a very wide range of different LiFePO4 solutions. This enables us to meet the demands of the various demanding markets in which we operate.

We have come to the market with a lithium solution for every demand!

ADVANTAGES

- Up to 4000 cycles
- Full capacity even at high speed discharge rates
- Fast charging without overheating and gassing
- Excellent life-span: service life up to 6 years
- Protection against overcharge and deep discharge
- Lighter weight: 70% lighter than standard lead acid batteries
- Ecologic: no acid, no lead, no toxic substances
- Small sizes
- Easy to use and to install
- Safest Li-Ion battery
- These LiFePO4 batteries can directly replace SLA batteries in many applications.
- The size is the same, the performance, service-life and weight are much better!

The most reliable Li-Ion batteries on the market:

Our LiFePO4 (Lithium Iron Phosphate) batteries are developed for cyclic applications, where batteries are frequently charged & discharged. LiFePO4 is the battery technology of the future for cyclic applications where light weight, high currents and a high number of cycles are important !

For cyclic applications.

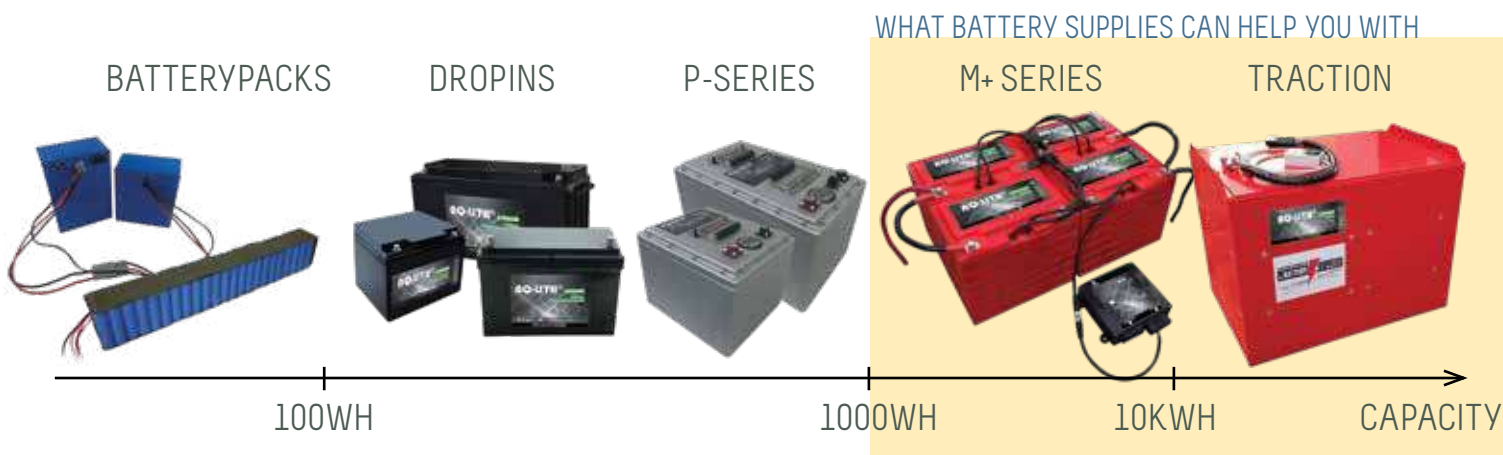
RANGE OF LI-ION BATTERIES

Batteries between 1 and 10 kWh

Our modular batteries M+ can be placed both in serial and parallel configuration and can easily meet your specifications. In addition to the flexibility, the delivery time is also a big advantage. However, these blocks still need to be assembled and connected by the customer.

Batteries from 10 kWh

If you want a ready-made solution in a specific container, we can propose our own compositions. These are assembled in the most common containers with voltages between 24V and 80V and capacities from 210Ah to 840Ah. If your desired battery does not appear in our standard assemblies, please let us know. Then we will find a suitable solution for you.



Lithium-Ion batteries

M+ BATTERIES

- ➔ MODULAR
- ➔ SERIAL & PARALLEL CONNECTION
- ➔ EASY INSTALLATION
- ➔ FLEXIBLE BATTERY SYSTEM



Our modular batteries M+ can be placed both in serial and parallel configuration and can easily meet your specifications.

These modular M+ batteries fit in a lot of spaces easily, you can also place them on their side if this is more convenient. The batteries each contain a slave BMS which is controlled by a master BMS (LIT/04.01.0085). This master BMS provides the necessary safety functions but also has a CANbus communication.

The batteries are supplied separately, you ensure the connection and the necessary additional components such as contactors and auxiliary relays. If desired, we can also offer these additional components.

LIFEP04 12.8V MODULE

Specifications		D12-150M+
Voltage (V)		12,8
Capacity (C/2) (Ah)		150,0
Weight (kg)		20,0
Dimensions (mm)		310 x 180 x 234
Terminals, Female Threaded		M8 x 1,25
Specific Energy (Wh/kg)		96,0
Standard Discharge	Max. current (A)	150,0
	Peak current (A)	300,0
	Cut-off Voltage (V)	10,0
Standard Charge	Charging current (V)	14,6
	Max. current (A)	72,5
	Charging time (u)	2,5



Canbus indicator: BAT/48769

Ideal for all M+ and AQ-LITH® traction batteries.

This indicator reads the CANBUS signals from the BMS and displays the SOC, voltage, current, temperature and all warnings. With potential-free contact for minimal SOC% (adjustable)



LIT/04.01.0085

Lithium-Ion batteries



PROJECTS

ACCESS EQUIPMENT



AQ-LITH® Lithium Custom-made
24V - 210Ah

CONSTRUCTION



AQ-LITH® Lithium Custom-made
80V - 420Ah

AGRI



AQ-LITH® Lithium Custom-made
48V - 420Ah

AGRI



AQ-LITH® Lithium Waterproof
4 x LIT/D48-100P

GSE (GROUND SUPPORT EQUIPMENT)



AQ-LITH® Lithium Custom-made
80V - 420Ah

AGV



AQ-LITH® Lithium Custom-made
24V - 210Ah

FORKLIFT



AQ-LITH® Lithium Custom-made
24V - 210Ah

BOAT



AQ-LITH® Lithium Custom-made
48V - 210Ah

ENERGY STORAGE



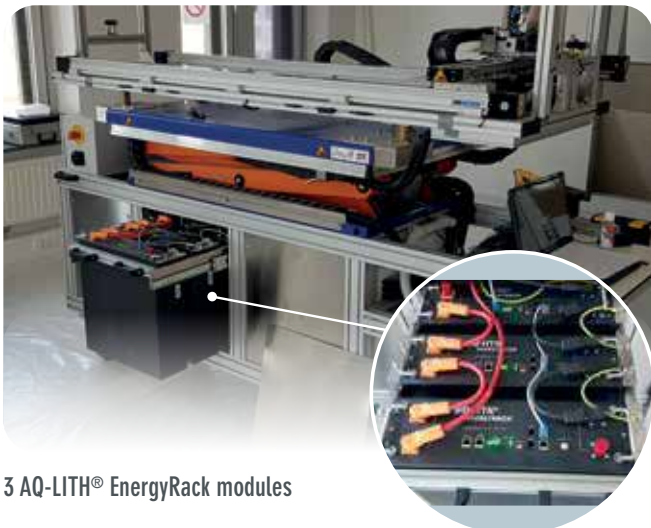
AQ-LITH® EnergyRack 46kWh

ENERGY STORAGE



AQ-LITH® 400V

TESTING EQUIPMENT



3 AQ-LITH® EnergyRack modules

ENERGY STORAGE



AQ-LITH® EnergyRack 138 kWh

Renewable energy storage

PYLONTECH® ENERGYRACK - INDUSTRIAL

Battery Supplies can offer you the AQ-LITH® EnergyBox batteries for residential use and the Pylontech® EnergyRack systems for industrial use.



- ➔ 15 UP TO 77 KWH
EXTENDABLE X4 TO 308 KWH
- ➔ FAN-COOLED CABINET
- ➔ LONG SERVICE LIFE (LIFEP04)

SUITABLE FOR:

- INCREASED SELF-CONSUMPTION
- REDUCED PEAK CONSUMPTION
- GRID SUPPORT SERVICES
- INCREASED POWER AT LIMITED GRID CONNECTION
- EMERGENCY SUPPLY

COMPATIBLE WITH



INDUSTRIAL BATTERIES

Pylontech® EnergyRack 29 - 48 - 67 - 77 kWh

This battery is suitable for consumers with an annual consumption < 500 MWh/yr. This battery consists of several modules of 48V 5kWh and is installed in a sturdy closed fan-cooled cabinet.

Model	SOL/48ER29PT	SOL/48ER48PT	SOL/48ER67PT	SOL/48ER77PT
Battery type	LiFeP04			
Capacity (kWh)	29	48	67	77
Number of 5kWh modules BAT/51035	6	10	16	16
Nominal capacity (Ah)	600	1000	1400	1600
Power (kW)	23040	38400	53760	61440
Nominal voltage (Vdc)	48			
Dimensions (mm)	660 x 650 x 2185		1320 x 650 x 1985	
Weight (kg)	358,6 ± 2%	517,4 ± 2%	771,2 ± 2%	864,4 ± 2%
D.O.D. (%)	95			
Cycle life	> 8000 @ 25°C			
Communication port	RS485, CAN			
Waranty	10 years (warranty) daily cycle*			

* Subject to registration of Pylontech EnergyRack at: <https://en.pylontech.com.cn/service/support/>

FOR PROFESSIONAL USE

The use of batteries for storing renewable energy for industry has been growing enormously in recent years. These batteries have multiple savings/opportunities.



INCREASED SELF-CONSUMPTION

The excess of solar or wind energy is stored and later used in case of shortages. This increases the company's own consumption and less energy is injected and taken from the grid. This decrease is the most important profit factor of the battery.



REDUCED PEAK CONSUMPTION

Companies are heavily penalized financially for their peak consumption. A battery controlled by an intelligent EMS (Energy Management System) can smooth out these peaks (peak-shaving).



CHEAP ENERGY

Energy prices react very erratically to general consumption, but also to the presence of sun and wind. This battery can store cheap energy from the grid to use itself at peak moments when energy is more expensive again.



GRID SUPPORT SERVICES

With an intelligent EMS system as the YUSO-inside EMS, the battery can also be used for opportunities of day-ahead prices and even for volatile prices in the imbalance market.



INCREASED POWER AT LIMITED GRID CONNECTION

In case of grid power limits, the battery can be used to add extra power during consumption peaks. Similar principle can be used to cope with injection limits.



EMERGENCY SUPPLY

The battery can be used as emergency power supply in case of grid problems.

This battery is particularly interesting for companies

- with a sufficiently large installation of solar panels (30 - 500 kW peak installation of solar panels (production is min 50% of total consumption))
- with an annual consumption of 30 to 500.000 kWh
- with sufficient consumption after solar hours, e.g. in the case of several shifts or cooling groups, etc.



YUSO is an energy aggregator based in Belgium but also active in the Netherlands and some parts of UK. The energy prices are transparent and based on EPEX prices. In case of opportunities in the volatile imbalance market, they take over the control of the EnergyRack battery to stabilize the grid which gives the opportunity to buy energy at negative / reduced prices. This results in a better payback-time of your energy storage system.

As first saving, the EnergyRack battery will help to increase your self-consumption. To optimize all functions, we advise to connect the battery with an intelligent Energy Management System (EMS). These systems will use the battery in case of opportunities in the spot market, imbalance market, peak shaving and will optimize and visualize the energy between battery, EV chargers and other consumers. The EMS systems compatible with the EnergyRack are: Smartgrid One, DTplan, Homate, Loxone, Mint...

For our standard EMS options, turn to page 48.

We can help you determine the right battery size and calculate the payback time of your battery. Feel free to provide us with information on your yearly consumption and production volume, then we can make a simulation with different battery sizes and their savings

For more information, please contact us at : info@batterysupplies.be.

We always recommend Li-ion for renewable energy storage based on the Total Cost of Ownership ratio. If you require a different technology for your solar storage system, we are happy to provide you with an offer.

Renewable energy storage

EMS : THE AQ-SMART® CONTROLS

AQ-SMART®

1. AQ-SMART® Multi-EnergyRack - BAT/51016

This control ensures that multiple Pylontech® EnergyRack batteries with Victron inverters and GX controls are all controlled together and form one battery. This configuration also requires only one power meter to control all batteries.

2. AQ-SMART® Dynamic – Multi EnergyRack - BAT/51017

The basic technical control for a use of multiple Pylontech® EnergyRack batteries within one installation. In addition, this controller looks at Day-Ahead prices via an Internet link so that the controller can control the battery according to variable prices. This allows the battery to be charged and discharged a second time overnight if price differences allow. To take advantage of this functionality, the user must have a variable energy contract with an energy supplier or have the intension to enter into a variable contract in the near future. The AQ-SMART® EMS works independently of the choice of energy provider.

3. AQ-SMART® Yuso® Inside - BAT/51018



This control supports all the functions of the basic control and the dynamic control, supplemented by a Yuso® Inside protocol, in order to take advantage of imbalance market opportunities. This requires a specific Yuso® energy contract. The conclusion of an energy contract is done through the independent company Yuso®. Only available in BENELUX and UK.

PYLONTECH® ENERGYRACK MODULE - RESIDENTIAL

Batteries for green renewable energy are important in the energy transition and the reduction of energy costs. These batteries for residential use will increase the self-consumption but also reduce peak consumption. With a compatible EMS, residential batteries can also be used to gain profits from the variable prices. Battery Suppliers can offer you the AQ-LITH® EnergyBox batteries for residential use and the Pylontech® EnergyRack systems for in

PYLONTECH® ENERGYRACK MODULE



Can be used with all kits for the EnergyBox

Model	BAT/51035
Battery type	LiFePO4
Capacity (kWh)	5
Nominal capacity (Ah)	100
Power (kW)	3840
Nominal voltage (Vdc)	48
Dimensions (mm)	442 x 420 x 161
Weight (kg)	39,7
D.O.D. (%)	95
Cycle life	> 8000 @ 25°C
Communication port	RS485, CAN
Waranty	10 years (warranty) daily cycle*

* Subject to registration of Pylontech EnergyRack at: <https://en.pylontech.com.cn/service/support/>

PYLONTECH® ENERGRACK CABINET WITH NATURAL VENTILATION INCLUDING BUSBAR AND FUSES.



BAT/51152: empty cabinet for max 4 modules.

Model	SOL/48ER15PT	SOL/48ER20PT
Battery type	LiFePO4	
Capacity (kWh)	15	20
Number of 5kWh modules BAT/51035	3	4
Nominal capacity (Ah)	300	400
Power (kW)	11520	15360
Nominal voltage (Vdc)	48	
Dimensions (mm)	600 x 600 x 700	585 x 510 x 860
Weight (kg)	147,5 ± 1%	190,8 ± 1%
D.O.D. (%)	95	
Cycle life	> 8000 @ 25°C	
Communication port	RS485, CAN	
Waranty	10 years (warranty) daily cycle*	

* Subject to registration of Pylontech EnergyRack at: <https://en.pylontech.com.cn/service/support/>

AQ-LITH® ENERGYBOX - RESIDENTIAL

AQ-LITH® ENERGYBOX



Store your solar energy on a battery from Battery Supplies.

We offer 3 types of EnergyBox batteries, according to your energy consumption: 3, 5 and 7kWh. These batteries can also be connected in parallel up to 14kWh.

The EnergyBox consists of LiFePO4 cells: this ensures an increased lifespan and a high degree of safety.

Ref	SOL/48EB3	SOL/48EB5	SOL/48EB7	2 x SOL/48EB5	2 x SOL/48EB7
Battery type	LiFePO4				
Nominal voltage (V)	51,2				
Capacity (kWh)	3	5	7	10	14
Max. Output (KW)	1,5	2,5	2,5	5	5
Dimensions (mm)	523 x 679 x 152.5	564.5 x 650 x 212	662 x 717 x 205	2 x 564.5 x 650 x 212	2 x 662 x 717 x 205
Weight (kg)	45	66	89	132	178
Charging voltage (V)	56,8				
Warranty	10 years				
Operating temperature	Discharge: -15°C – 50°C - Charge: 0°C – 45°C				
IP	IP54				

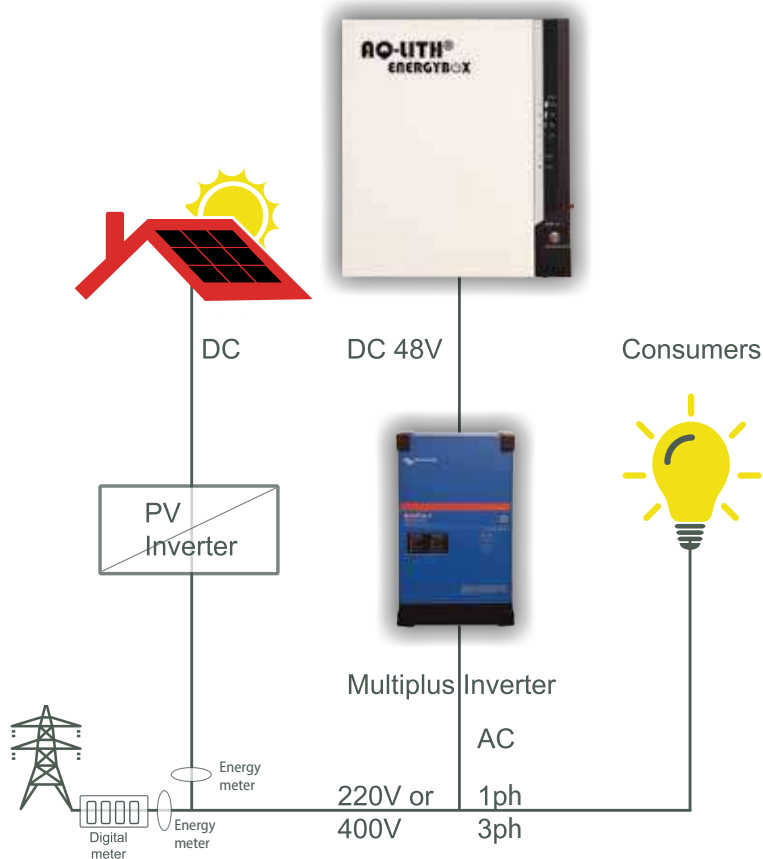
Renewable energy storage

RETROFIT - INVERTER KITS

ADVANTAGES

- Can be added to existing installations, because it does not interfere with existing installation.
- Low cost if the PV-installation already exists
- Fits all brands of PV installation
- Meets the regulations of the grid operator

• The kits can be used for a 3x400V and 3x230V grid. The kit contains one monophase inverter connected to onephase. The power meter, however, is a three phase version and the controller will reduce the sum of the currents of ALL phases (so called phase compensation)



VICTRON INVERTERS MULTIPLUS II

ADVANTAGES

- High-quality European brand
- Superior UPS system
- Excellent app and support via cloud



	For single-phase grid	For three-phase grid
For 1 battery based on Multiplus II 3 kVA	SOL/VIC1R3M1	SOL/VIC1R3T1
For 2 batteries based on Multiplus II 5 kVA	SOL/VIC1R5M2	SOL/VIC1R5T2

AQ-TRON® INVERTER

ADVANTAGES

- Easy and quick installation
- Economic solution
- Plug & play



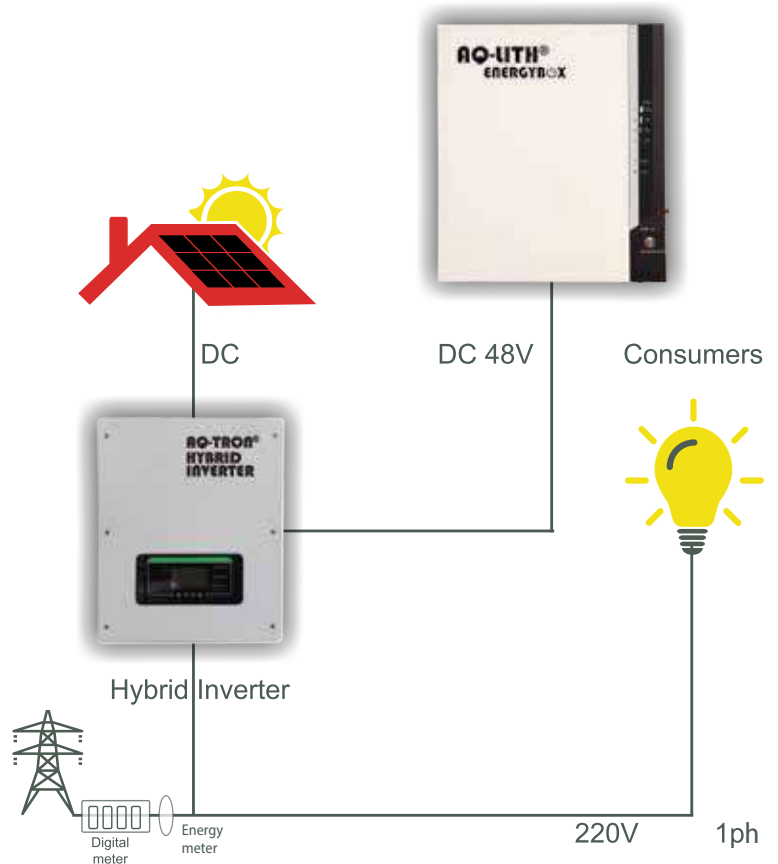
	For single-phase grid	For three-phase grid
For 1 battery based on AQ-TRON® RETROFIT 3 kVA	SOL/AQT1R3M1	-

HYBRID - INVERTER KITS

ADVANTAGES

- The best solution for a total new PV-installation with battery
- Higher energy efficiency

• The kits can be used for a 3x400V and 3x230V grid. The kit contains one monophase inverter connected to onephase. The power meter, however, is a three phase version and the controller will reduce the sum of the currents of ALL phases (so called phase compensation)



VICTRON INVERTERS EASYSOLAR II

ADVANTAGES

- Including MPPT & GX inside one casing.
- fan-ventilated



	For single-phase grid	For three-phase grid
For 1 battery based on Easysolar II 3 kVA	SOL/VIC1H3M1	SOL/VIC1H3T1
For 1 battery based on Easysolar II 5 kVA	SOL/VIC1H5M1	SOL/VIC1H5T1
For 2 batteries based on Easysolar II 5 kVA	SOL/VIC1H5M2	SOL/VIC1H5T2

AQ-TRON® HYBRID INVERTER

ADVANTAGES

- Easy and quick installation
- Economic solution
- Plug & play



	For single-phase grid	For three-phase grid
For 1 battery based on AQ-TRON® HYBRID 3 kVA	SOL/AQT1H3M1	SOL/AQT1H3T1
For 1 battery based on AQ-TRON® HYBRID 5 kVA	SOL/AQT1H5M1	SOL/AQT1H5T1
For 2 batteries based on AQ-TRON® HYBRID 5 kVA	SOL/AQT1H5M2	SOL/AQT1H5T2

Renewable energy storage

OVERVIEW INVERTERS

	Retrofit		
Belongs to kit	SOL/VIC1R3M1 - SOL/VIC1R3T1 SOL/VIC3R3T1 - SOL/VIC3R5T1	SOL/VIC1R5M2 - SOL/VIC1R5T2	SOL/AQT1R3M1
Product series	Victron Multiplus II 3kVA	Victron Multiplus II 5kVA	AQ-TRON® Inverter
Model name	48/3000/35-32	48/5000/70-50	BAT/50759
Control	External Cerbo GX		
MPPT Model	-	-	-
Restrictions	-	-	-
BATTERY			
DC Battery Connection	Nominal 51,2V		Nominal 51,2V
PV (DC)			
Maximum DC PV Voltage	-	-	-
PV Start-up voltage	-	-	-
Number of trackers	-	-	-
Max. input power per MPPT	-	-	-
Max. input power for total MPPT	-	-	-
Max. efficiency (MPPT)	-	-	-
GRID (AC)			
AC Input Voltage	Input voltage range: 187-265 VAC / Input frequency: 45 - 65 Hz		180 - 276 VAC
AC Output	230 VAC ±2% / 50Hz ± 0,1% (60Hz)		180 - 276 VAC - 50/60Hz
AC Phase connection	Single		Single
Suitable for 1x 230V powergrid	Yes	Yes	Yes
Suitable for 3x 230V powergrid	Yes, Monophase connected - Phase Compensation Protocol		Yes, Monophase connected - Phase Compensation Protocol
Suitable for 3x 400V powergrid	Yes, Monophase connected - Phase Compensation Protocol		Yes, Monophase connected - Phase Compensation Protocol
Cont. Output power at 25°C	3000 VA/ 2400 W	5000 VA/ 4000W	3000 VA / 3000 W
Max. AC input current	32A	50A	13,7 A
Auxilliary output	32A	32A	13 A
Maximum efficiency (Inverter)	95%	96%	97,2%
GENERAL			
Interfaces	BMS-can, USB Ethernet, VE.Direct, Wi-Fi		RS485, Wifi/Ethernet/GPRS, SD, can
Operating temp. Range	-40 to +65°C (fan assisted cooling)		-30 to +60°C (natural design cooling) Max. altitude 2000m
Humidity (non-condensing)	max 95%		max 100%
Protection category	IP22		IP65
Battery connection	M8 bolts		M6 bolts
PV connection	no direct PV connection		no direct PV connection
230 VAC connection	Screw terminals 13mm ² (6 AWG)		Screw terminals 13mm ² (6 AWG)
Weight	19 kg	30 kg	16 kg
Dimensions (h x w x d) mm	506 x 275 x 147	565 x 323 x 148	532 x 360 x 172
Warranty	5 years (upgradable to 10 years)		5 years
Preprogramming	Possible	Possible	Plug & Play

	Retrofit		MPPT (for hybrid installation)	
Belongs to kit	SOL/VIC3R8T1	SOL/VIC3R10T1	-	-
Product series	Victron Quattro 8kVA	Victron Quattro 10kVA	Victron SmartSolar MPPT RS	Victron SmartSolar MPPT RS
Model name	48/8000/110-100/100	48/10000/140-100/100	RS450/100	RS450/200
Control	External Cerbo GX			
MPPT Model	-	-	MPPT RS 450/100	MPPT 450 RS 450/200
Restrictions	-	-	Only in combination with Victron Multiplus II or other Victron product	
BATTERY				
DC Battery Connection	Nominal 48V		-	-
PV (DC)				
Maximum DC PV Voltage	-	-	450V	
PV Start-up voltage	-	-	120V	
Number of trackers	-	-	2	4
Max. input power per MPPT	-	-	4000 W	4000 W
Max. input power for total MPPT	-	-	5760 W	11520 W
Max. efficiency (MPPT)	-	-	96%	96%
GRID (AC)				
AC Input Voltage	2x Input voltage range: 187-265 VAC / Input frequency: 45 - 65 Hz		-	-
AC Output	230 VAC ±2% / 50Hz ± 0,1% (60Hz)		-	-
AC Phase connection	Single		-	-
Suitable for 1x 230V powergrid	Yes	Yes	-	-
Suitable for 3x 230V powergrid	Yes, Monophase connected - Phase Compensation Protocol		-	-
Suitable for 3x 400V powergrid	Yes, Monophase connected - Phase Compensation Protocol		-	-
Cont. Output power at 25°C	8000 VA/ 6400 W	10000 VA/ 8000 W	-	-
Max. AC input current	2x 100 A	2x 100 A	-	-
Auxilliary output	50 A	50 A	-	-
Maximum efficiency (Inverter)	96%	96%	-	-
GENERAL				
Interfaces	VE.Direct port, VE.Can port & Bluetooth			
Operating temp. Range	-40 to +65°C Max. altitude 3500m		-40 to +60°C (fan assisted cooling)	
Humidity (non-condensing)	max 95%		max 95%	
Protection category	IP22		IP21	
Battery connection	4x M8 bolts (2+ & 2- connections)		M8 bolts	
PV connection	no direct PV connection		2x Power terminals 16 mm ²	
230 VAC connection	M6 bolts		no direct AC connection	
Weight	41 kg	51 kg	7,9 kg	13,7 kg
Dimensions (h x w x d) mm	470 x 350 x 280	470 x 350 x 280	440 x 313 x 126	487 x 434 x 146
Warranty	5 years (upgradable to 10 years)		5 years (upgradable to 10 years)	
Preprogramming	Possible	Possible	-	-

Renewable energy storage

OVERVIEW INVERTERS

	All-in-one Hybrid			
Belongs to kit	SOL/VIC1H3M1 - SOL/VIC1H3T1	SOL/VIC1H5M1 - SOL/VIC1H5T1 SOL/VIC1H5M2 - SOL/VIC1H5T2	SOL/AQT1H3M1 - SOL/AQT1H3T1	SOL/AQT1H5M1 - SOL/AQT1H5T1 SOL/AQT1H5M2 - SOL/AQT1H5T2
Product series	Victron EasySolar II	Victron EasySolar II	AQ-TRON® Hybrid Inverter	AQ-TRON® Hybrid Inverter
Model name	48/3000/35-32 MPPT 250/70 GX	48/5000/70-50 MPPT 250/100 GX	BAT/50556	BAT/50567
MPPT Model	MPPT 250/70-Tr	MPPT 250/100-Tr	-	-
Restrictions	-	-	-	-
BATTERY				
DC Battery Connection	38 - 66VDC		Nominal 51,2V	Nominal 51,2V
PV (DC)				
Maximum DC PV Voltage	250V		600V	
PV Start-up voltage	61V		120 V	
Number of trackers	1	1	2	2
Max. input power per MPPT	4000 W	5800 W	2000 W	3000 W
Max. input power for total MPPT	4000 W	5800 W	3990 W	6650 W
Max. efficiency (MPPT)	0,99		0,99	
GRID (AC)				
AC Input Voltage	Input voltage range: 187-265 VAC / Input frequency: 45 - 65 Hz		180 - 276 VAC	
AC Output	230 VAC ±2% / 50Hz ± 0,1% (60Hz)		180 - 276 VAC - 50/60Hz	
AC Phase connection	Single		Single	
Suitable for 1x 230V powergrid	Yes	Yes	Yes	Yes
Suitable for 3x 230V powergrid	Yes, Monophase connected - Phase Compensation Protocol		Yes, Monophase connected - Phase Compensation Protocol	
Suitable for 3x 400V powergrid	Yes, Monophase connected - Phase Compensation Protocol		Yes, Monophase connected - Phase Compensation Protocol	
Cont. Output power at 25°C	3000 VA / 2400 W	5000 VA / 4000 W	3000 VA / 3000 W	5000 VA / 3000 W
Max. AC input current	32A	50A	13,7 A	22,8 A
Auxilliary output	32A	50A	13 A	13 A
Maximum efficiency (Inverter)	95%	96%	97,2%	97,3%
GENERAL				
Interfaces	BMS-can, USB Ethernet, VE.Direct, Wi-Fi		RS485, Wifi/Ethernet/GPRS, SD, can	
Operating temp. Range	-20 to +45°C (fan assisted cooling) Max. altitude 2000m		-30 to +60°C (natural design cooling) Max. altitude 2000m	
Humidity (non-condensing)	max 95%		max 100%	
Protection category	IP21		IP65	
Battery connection	M8 bolts		M6 bolts	
PV connection	M6 bolts		4 - 6mm ² connectoren	
230 VAC connection	Screw terminals 16mm ² (6 AWG)		Screw terminals 16mm ² (6 AWG)	
Weight	26 kg	38,6 kg	20,5 kg	20,5 kg
Dimensions (h x w x d) mm	499 x 268 x 237	604 x 323 x 253	566 x 394 x 173	
Warranty	5 years (upgradable to 10 years)		5 years	
Preprogramming	Possible	Possible	Plug & Play	Plug & Play

HYBRID SOLUTIONS DC-DC - RESIDENTIAL (FOR NEW INSTALLATIONS)

BATTERIES

ENERGYBOX &
ENERGYRACK MODULE



SOL/48EB3 3kWh
SOL/48EB5 5kWh
SOL/48EB7 7kWh
BAT/51035 5kWh



2 x SOL/48EB5 10kWh (2x5kWh)
2 x SOL/48EB7 14kWh (2x7kWh)
2 x BAT/51035 10kWh (2x5kWh)



SOL/48EB3 3kWh
SOL/48EB5 5kWh
SOL/48EB7 7kWh
BAT/51035 5kWh



2 x SOL/48EB5 10kWh (2x5kWh)
2 x SOL/48EB7 14kWh (2x7kWh)
2 x BAT/51035 10kWh (2x5kWh)

INVERTER KIT*



SINGLE-PHASE NET

THREE-PHASE NET,
SINGLE-PHASE INVERTER

Based on AQ-TRON® hybrid

Based on AQ-TRON® hybrid

SOL/AQT1H3M1 3kVA
SOL/AQT1H5M1 5kVA

SOL/AQT1H3T1 3kVA
SOL/AQT1H5T1 5kVA

SOL/AQT1H5M2 5kVA

SOL/AQT1H5T2 5kVA

Based on Victron Easysolar II

Based on Victron Easysolar II

SOL/VIC1H3M1 3kVA
SOL/VIC1H3M1-L 3kVA
SOL/VIC1H5M1 5kVA
SOL/VIC1H5M1-L 5kVA

SOL/VIC1H3T1 3kVA
SOL/VIC1H3T1-L 3kVA
SOL/VIC1H5T1 5kVA
SOL/VIC1H5T1-L 5kVA

SOL/VIC1H5M2 5kVA
SOL/VIC1H5M2-L 5kVA

SOL/VIC1H5T2 5kVA
SOL/VIC1H5T2-L 5kVA

References with additional "L" at the end are inverters with pre-programmation for easy and quick installation.

* All inverter kits include: inverter, control gx, meters, cables,...

Renewable energy storage

RETROFIT SOLUTIONS AC-AC - RESIDENTIAL (FOR EXISTING SOLAR PANEL INSTALLATIONS)

BATTERIES

ENERGYBOX & ENERGYRACK MODULE



SOL/48EB3	3kWh
SOL/48EB5	5kWh
SOL/48EB7	7kWh
BAT/51035	5kWh



2 x SOL/48EB5	10kWh (2x5kWh)
2 x SOL/48EB7	14kWh (2x7kWh)



2 x BAT/51035	10kWh (2x5kWh)
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INVERTER KIT*



SINGLE-PHASE NET

THREE-PHASE NET,
SINGLE-PHASE INVERTER

Based on AQ-TRON® retrofit

Based on AQ-TRON® retrofit

SOL/AQT1R3M1 3kVA

In development

Based on Victron Multiplus II

Based on Victron Multiplus II

SOL/VIC1R3M1 3kVA

SOL/VIC1R3T1 3kVA

SOL/VIC1R3M1-L 3kVA

SOL/VIC1R3T1-L 3kVA

SOL/VIC1R5M2 5kVA

SOL/VIC1R5T2 5kVA

SOL/VIC1R5M2-L 5kVA

SOL/VIC1R5T2-L 5kVA

BATTERIES

ENERGYRACK MODULES



SOL/48ER15PT 14.4kWh 1 x

SOL/48ER20PT 19.2kWh 3 x

INVERTER KIT*



SINGLE-PHASE NET

THREE-PHASE NET,
SINGLE-PHASE INVERTER

Based on Victron Multiplus II

Based on Victron Multiplus II

SOL/VIC1R5M2 5kVA

SOL/VIC1R5T2 5kVA

SOL/VIC1R5M2-L 5kVA

SOL/VIC1R5T2-L 5kVA

-

SOL/VIC3R3T1 3 x 3kVA

References with additional "L" at the end are inverters with pre-programming for easy and quick installation.

* All inverter kits include: inverter, control gx, meters, cables,...

RETROFIT SOLUTIONS AC-AC - INDUSTRIAL (FOR EXISTING SOLAR PANEL INSTALLATIONS)

BATTERIES

ENERGYRACK



SOL/48ER29PT 29kWh

SOL/48ER48PT 48kWh



SOL/48ER67PT 67kWh

SOL/48ER77PT 77kWh

INVERTER KIT*

3 x



3 x



3 x

THREE-PHASE NET,
SINGLE-PHASE INVERTER

Based on Victron Multiplus II

SOL/VIC3R3T1 3 x 3kVA

SOL/VIC3R5T1 3 x 5kVA

SOL/VIC3R8T1 3 x 8kVA

SOL/VIC3R8T1 3 x 8kVA
OR
SOL/VIC3R10T1 3 x 10kVA

To increase the capacity, the EnergyRacks can be placed in parallel up to 4x at AC-side by using the AQ-SMART® EMS, you only need one grid meter.

HYBRID SOLUTIONS AC-AC - INDUSTRIAL (FOR NEW INSTALLATIONS)

All kits can be extended with separate MPPT excl. busbar.

Smartsolar MPPT RS450/100TR - 5,8kW -> BAT/50375

Smartsolar MPPT RS450/200TR - 11,6kW -> BAT/50623

GRID AND PV METERS

	With RS485 connection	With ethernet connection
Single-phase version, for currents <100A	ET 112 : BAT/49149	
Version 3 x 230V and 3 x 400V, for currents <65A	EM24 DINAV23XISX : BAT/49982	EM24DIN AV2 3X E1 X : BAT/51187
Version 3 x 400V, for currents >65A(*)	EM24 DIN.AV5.3D.IS.X : BAT/50228	EM24 DIN AV5 3X E1 X : BAT/50840
To be ordered separately : RS485/USB adaptor	BAT/49630	
Optional: USB-HUB at 2 meters and built-in GX	BAT/50857	

(*) For currents > 65A, current transformers CT's are placed on the power cables and connected separately to the meter. These CT's are not included and are sought by the installer on the local market. Secondary current 5A. More info at www.gavazzionline.com/pdf/EM24DINDS.pdf

Renewable energy storage

RES SOPZS & RES SOPZV

RES SOPzS is an advanced cost-effective solution, ideal for energy storage applications, that demand long cycle life and increased watering intervals.

RES SOPzV is an exceptional combination of benefits for autonomous systems where there is demand for no water refilling.

Available as stand-alone 2V cells as well as complete system solutions in 12V, 24V, and 48V configurations, with specially designed metallic trays for trouble-free installation.

*SOPzS are vented lead-acid batteries with tubular plates for energy storage applications

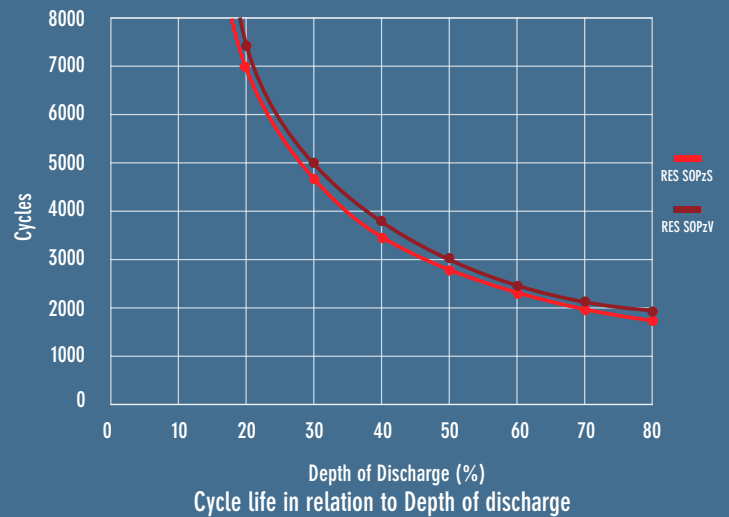
*SOPzV are valve-regulated lead-acid batteries with tubular plates and GEL electrolyte for energy storage applications



BENEFITS

- Minimum Maintenance Requirements
- Operational Safety
- High Capacity Performance
- Long Cycle Life: up to 2400 cycles at 50% DoD
- Fully Recyclable Product
- Circular Economy Enabler
- Modular Solution
- Complete System Installation
- Available as Option

SERVICE LIFE: 2500 (RES SOPzV) & 2300 (RES SOPzS) CYCLES DOD 60%



APPLICATIONS



Solar

TECHNICAL INFORMATION

For more details about layouts & terminals, flip to page 75 for more information.

RES SOPzS



Ref.	Voltage (V)	Capacity (Ah/ C120)	CELLS			Weight (kg)
			Dimensions (mm)			
			X	Y	H	
2 RES SOPzS 215	2	215	198	65	432	11,5
3 RES SOPzS 310	2	310	198	83	432	15,4
4 RES SOPzS 390	2	392	198	83	502	18,4
5 RES SOPzS 500	2	503	198	101	502	23,3
6 RES SOPzS 605	2	605	198	119	637	28,0
5 RES SOPzS 720	2	721	198	101	637	30,5
6 RES SOPzS 860	2	860	198	119	637	36,9
7 RES SOPzS 965	2	969	198	137	637	43,4
12 RES SOPzS 1270	2	1271	198	174	637	51,6
14 RES SOPzS 1380	2	1382	198	192	637	58,1

RES SOPzV



Ref.	Voltage (V)	Capacity (Ah/ C120)	CELLS			Weight (kg)
			Dimensions (mm)			
			X	Y	H	
2 RES SOPzV 150	2	150	198	343	367	9,0
3 RES SOPzV 225	2	225	198	343	367	12,7
4 RES SOPzV 280	2	284	198	568	592	15,4
5 RES SOPzV 425	2	426	198	568	592	22,0
6 RES SOPzV 565	2	568	198	568	592	28,7
5 RES SOPzV 710	2	710	198	568	592	35,3
6 RES SOPzV 850	2	852	198	568	592	42,1
7 RES SOPzV 990	2	994	198	568	592	48,8
8 RES SOPzV 1135	2	1136	198	568	592	55,5
7 RES SOPzV 1190	2	1190	198	713	737	60,0
8 RES SOPzV 1360	2	1360	198	713	737	68,1



Stationary

OPZS & OPZV



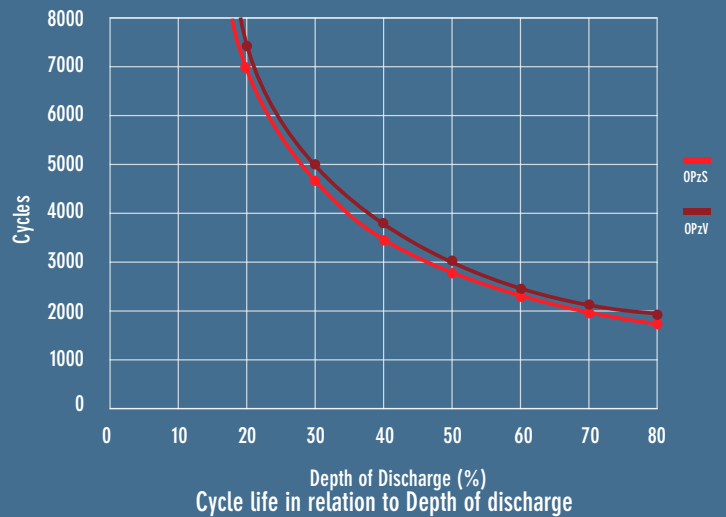
OPZS batteries are **stand-by batteries** with tubular plates, especially designed as battery backup power for all industrial applications which demand low-maintenance as well as average and long discharges.

The tubular design with lead selenium alloy guarantees a longer operating life, minimal maintenance and optimal performances in cyclic and standby applications.

BENEFITS

- Refilling of the water only every 3 to 5 years in float charge use, under normal conditions
- Longer battery life: 15 years in float at 20°, even in cyclical use
- Flexible screwed connectors:
 - simple and easy connection
 - less accessories demanded
 - less time for maintenance & control
 - reduction of the tension is smaller in the connections
 - better protection against short-circuits
- Self-discharge less than 3 %
- Very low floating current

SERVICE LIFE: 2500 (OPZV) & 2300 (OPZS) CYCLES DOD 60%



APPLICATIONS



Traffic signal



Telecom



UPS



Power generation & utilities



Emergency lighting



Grid - Ancillary services



Railway

TECHNICAL INFORMATION

For more details about layouts & terminals, flip to page 75 for more information.



Ref.	Voltage (V)	Capacity (Ah/ C10)	Capacity (Ah/ C5)	Dimensions (mm)			Weight (kg)
				X	Y	H	
2V OPzS-cells open lead-acid							
20PzS100	2V	131	113	103	206	383	13,4
30PzS150	2V	187	162	103	206	383	15,6
40PzS200	2V	226	198	103	206	383	17,5
50PzS250	2V	283	249	125	206	383	21,2
60PzS300	2V	337	296	145	206	383	24,9
50PzS350	2V	418	373	125	206	499	28,6
60PzS420	2V	500	446	145	206	499	33,5
70PzS490	2V	570	511	166	206	499	38,40
50PzS500	2V	659	568	145	206	674	42,3
60PzS600	2V	730	638	145	206	674	46,5
70PzS700	2V	905	782	191	210	674	59,4
80PzS800	2V	976	855	191	210	674	63,5
90PzS900	2V	1116	974	233	210	674	73,5
100PzS1000	2V	1205	1055	233	210	674	77,6
110PzS1100	2V	1402	1218	275	210	674	87,7
120PzS1200	2V	1446	1268	275	210	674	91,9
110PzS1375	2V	1699	1503	275	210	825	108,9
120PzS1500	2V	1747	1563	275	210	825	114,1
140PzS1750	2V	2156	1909	399	214	800	145,9
150PzS1875	2V	2250	2003	399	214	800	151,0
160PzS2000	2V	2331	2087	399	214	800	156,2
180PzS2250	2V	2808	2479	487	212	800	183,7
200PzS2500	2V	3060	2714	487	212	800	194,1
220PzS2750	2V	3276	2909	576	212	800	219,7
240PzS3000	2V	3497	3115	576	212	800	229,9
260PzS3250	2V	3671	3301	576	212	800	143,0
OPzS Block open lead-acid							
3 OPzS 150	6V	180	156	233	224	394	41,2
4 OPzS 200	6V	220	193	272	205	375	46,9
5 OPzS 250	6V	292	254	380	205	375	60,8
6 OPzS 300	6V	321	284	380	205	375	67,2
1 OPzS 50	12V	64	55	272	205	375	40,9
2 OPzS 100	12V	109	97	272	205	375	49,3
3 OPzS 150	12V	159	142	380	205	375	69,5



Ref.	Voltage (V)	Capacity (Ah/ C10)	Capacity (Ah/ C5)	Dimensions (mm)			Weight (kg)
				X	Y	H	
2V OPzV-cells sealed GEL (maintenance free)							
20PzV100	2V	122	108	103	206	382	13,6
30PzV150	2V	183	162	103	206	382	15,8
40PzV200	2V	244	216	103	206	382	18,2
50PzV250	2V	305	270	124	206	382	21,9
60PzV300	2V	366	324	145	206	382	25,9
50PzV350	2V	435	385	124	206	499	30,1
60PzV420	2V	522	463	145	206	499	35,6
70PzV490	2V	609	540	166	206	499	41,0
50PzV500	2V	625	552	145	206	671	43,9
60PzV600	2V	750	663	145	206	671	48,3
70PzV700	2V	875	773	191	210	672	61,1
80PzV800	2V	1000	884	191	210	672	65,5
90PzV900	2V	1125	994	233	210	674	76,0
100PzV1000	2V	1250	1105	233	210	674	80,4
110PzS1100	2V	1375	1215	275	210	673	90,8
120PzV1200	2V	1500	1326	275	210	673	95,3
110PzS1375	2V	1573	1386	275	210	824	105,1
120PzV1500	2V	1716	1512	275	210	824	110,2
140PzV1750	2V	2002	1764	399	214	799	146,0
150PzV1875	2V	2145	1890	399	214	799	151,1
160PzV2000	2V	2288	2016	399	214	799	156,2
180PzV2250	2V	2574	2269	487	212	797	185,2
200PzV2500	2V	2860	2521	487	212	797	195,3
220PzV2750	2V	3146	2772	576	212	799	221,2
240PzV3000	2V	3432	3023	576	212	799	231,6
260PzV3250	2V	3718	3273	576	212	799	241,8
OPzV Block sealed GEL (maintenance free)							
4 OPzV 200	6V	220	198	272	205	372	48,5
5 OPzV 250	6V	275	248	380	205	372	62,9
6 OPzV 300	6V	330	297	380	205	372	69,8
1 OPzV 50	12V	54	49	272	205	372	42,2
2 OPzV 100	12V	108	98	272	205	372	50,6
3 OPzV 150	12V	162	146	380	205	372	71,8

MAIN RANGES OF APPLICATION

Thanks to the OPzS stationary battery series, we can offer a reliable and environment-friendly energy source for back-up systems for innumerable applications, such as: telecom business, the railways, electricity cabins, uninterruptible power supplies, ups, electricity and nuclear power plants, wind and solar energy etc.

E.g.: 12V, 240 watt, 1 hour:

Capacity per cell = $240 / 6 = 40A$

When you take 1,75V/cell as final tension for 60 minutes

Choice: DAS12-33: 40,3 watt or DAS 12-44: 53,3 watt.

CHARACTERISTICS

- Minimum Maintenance Requirements
- Operational Safety
- Excellent Capacity Performance
- Long Cycle Life - up to 20 years (OPzS) 18 years (OPzV)
- Fully Recyclable Product - Circular Economy Enabler
- OPzV: Flexible installation, variants available for vertical or horizontal Installation

Stationary

FRONT ACCESS - AGM

Our Front Terminal batteries are specially designed for telecom applications, floating charge design life can reach 12 years.

It adopts a special paste formula to improve battery charge acceptance. By stable performance and good consistency, it is a type of reserve power battery suitable for the application of outdoor telecommunication and other backup power supply.

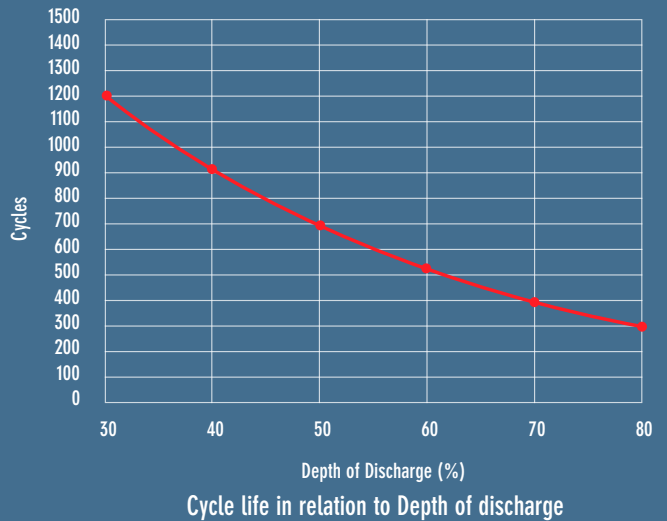
The design of a long & narrow structure and front terminal make it easy to be installed and maintained.



BENEFITS

- 12 year Design Life (floating charge)
- Operating temperature -15°C ~ 55°C
- Improved charge acceptance
- Low-self discharge rate ($\leq 3\%$)
- Good recovery ability after deep discharge
- High corrosion resistant performance
- Valve Regulated design, no free liquid electrolyte, Maintenance-free
- Special lead plaster and gel electrolytes for improving battery charging performance

SERVICE LIFE: 300 CYCLES DOD 80%



APPLICATIONS



Telecom



Solar



Wind energy



UPS



Datacenter

TECHNICAL INFORMATION

For more details about layouts & terminals, flip to page 75 for more information.



The front terminal AGM battery, designed for telecommunication applications with a floating life of up to 12 years, uses thickened 3D curved plates with special paste formula and latest AGM technology.

It offers stable performance and good consistency and is suitable for outdoor telecommunication and other backup power applications.



Reference	Voltage (V)	Capacity (Ah/ C10)	Capacity (Ah/C3)	Capacity (Ah/C1)	Dimensions (mm)			Weight (kg)	Terminals
					X	Y	H		
AGM - 12Y DESIGN LIFE									
DAB12-100FA	12	100	80,7	65,5	395	110	286	31,0	M8
DAB12-150FA	12	150	121,0	98,2	551	110	287	45,0	M8
DAB12-180FA	12	180	145,0	118,0	560	125	317	53,5	M8
DAB12-200FA	12	200	161,0	131,0	560	125	317	58,7	M8



GENERAL FEATURES

- Narrow structure and front terminal design, suitable for 19- inch and 23-inch standard cabinets
- High corrosion resistant performance: Pb-Ca multi-alloy grid
- Excellent charge acceptance ability
- Excellent deep cycle discharge capability
- Strong high and low temperature performance
- Precision sealing technology
- Long life

Stationary

DAB - AGM STATIONARY BATTERIES

**100%
maintenance
free**

DAB series battery is specially designed for UPS systems, emergency power, and security system applications.

Using a thick plate and high corrosion resistance grid alloy, matching with a high-impact AGM separator, the battery maintains high consistency for better performance and reliable standby service life.

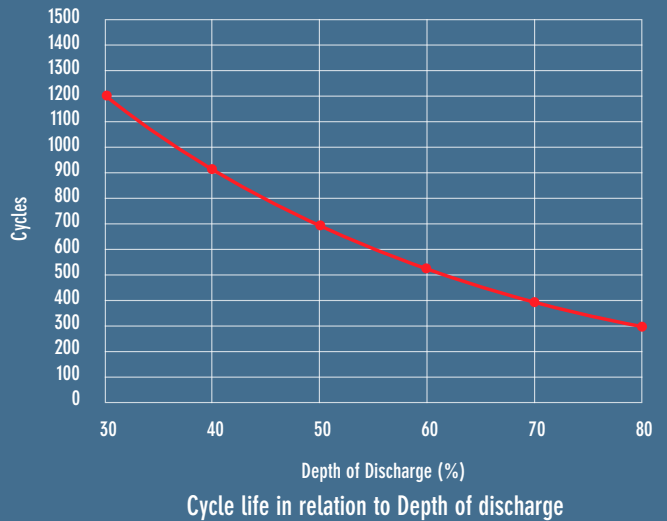


VRLA: Valve Regulated Lead-Acid
SLA: Sealed Lead-Acid
AGM: Absorbed Glass Matt

BENEFITS

- Valve Regulated design, no free liquid electrolyte, Maintenance - free
- Designed floating service life: 10 years @ 25°C
- Stable performance and small internal resistance, good high performance for recycling use
- Thickened Sn alloy plate and the grid with corrosion resistance
- Wide operating temperature range: -15-35°C
- Self-discharge rate: ≤ 3% / month

SERVICE LIFE: 300 CYCLES DOD 80%



APPLICATIONS



Wind energy



Solar



UPS



Telecom



Emergency lighting



Power generation & utilities

TECHNICAL INFORMATION

For more details about layouts & terminals, flip to page 75 for more information.

GENERAL FEATURES

- High corrosion resistant performance: Pb-Ca multi-alloy grid
- High energy density and power density
- Optimized Capability of instant High-current Discharging
- Excellent charge acceptance ability
- Excellent deep cycle discharge capability
- Strong high and low temperature performance
- Precision sealing technology
- Long life



Reference	Voltage (V)	Capacity (Ah/ C10)	Capacity (Ah/ C3)	Dimensions (mm)			Weight (kg)	Layout	Terminals
				X	Y	H			
6V									
DAB6-110	6	96,2	76,50	194	170	212	16,5	1	M8
DAB6-160	6	158,0	134,00	298	171	229	26,4	1	M8
DAB6-180	6	197,0	170,10	260	180	250	29,5	0	M8
DAB6-200	6	232,0	200,10	322	178	231	34,0	1	M8
DAB6-225	6	227,0	182,40	243	188	275	32,0	0	M8
DAB6-270	6	255,0	220,20	260	180	273	35,0	0	M8
8V									
DAB8-160	8	147,0	121,00	260	182	298	36,8	1	M8
12V									
DAB12-7.5	12	9,0	7,71	151	65	103	2,6	3	T1
DAB12-14	12	15,4	13,30	151	99	100	4,4	3	T2
DAB12-16-M5	12	15,4	13,30	151	99	98,5	4,1	3	M5
DAB12-26	12	24,4	20,20	166	175	125	7,7	0	M5
DAB12-28	12	26,3	21,80	165	125	175	8,0	0	M5
DAB12-32	12	37,2	32,10	267	77	170	9,2	0	M5
DAB12-33	12	32,0	25,70	196	131	160	10,0	1	M6
DAB12-44	12	42,1	34,30	198	167	158	13,0	0	M6
DAB12-55	12	55,6	44,70	229	138	207	17,5	1	M6
DAB12-70J	12	65,7	52,80	350	166	175	21,0	0	M6
DAB12-80	12	92,9	80,10	260	168	210	26,0	1	M6
DAB12-100	12	90,9	72,90	307	168	211	30,7	1	M8
DAB12-110	12	122,0	105,00	330	172	214	33,5	1	M8
DAB12-120	12	117,0	95,60	409	177	227	37,0	1	M8
DAB12-135	12	157,0	135,00	336	172	279	45,0	1	M8
DAB12-150	12	174,0	150,00	481	170	239	50,0	1	M8
DAB12-160	12	173,0	137,70	532	207	219	51,0	4	M8
DAB12-200	12	211,0	169,80	522	240	222	61,5	4	M8
DAB12-230	12	230,0	190,00	521	270	208	74,0	4	M8

Stationary

DAB - AGM HIGH RATE STATIONARY BATTERIES

DAB-HR series is specially designed for heavy load discharge applications with 8 to 15 years of design life in float service.

By using strong grids and specially designed active material the DAB-HR series offers stable performance during high current discharge. These series offers 30% more power output than the standard range. Suitable for UPS/EPS systems where high current loads are required.

**100%
maintenance
free**

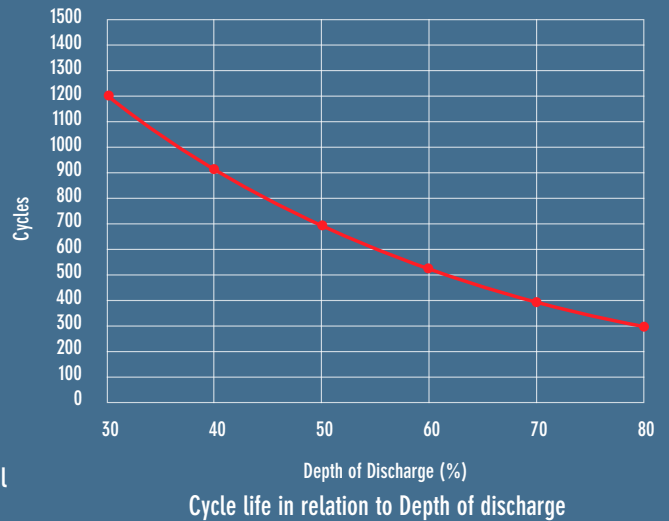


VRLA:	Valve Regulated Lead-Acid
SLA:	Sealed Lead-Acid
AGM:	Absorbed Glass Matt

BENEFITS

- Capacity range: 16W-850W
- Voltage class: 6V/12V
- Long design life (25°C): 8-15 years
- Low self-discharge rate: ≤ 3%/month
- High sealed reaction efficiency: ≥99%
- Wide operation temperature range: - 20°C-60°C
- Structure compact design, shorter internal connectors between cells. Thus low internal resistance
- Plate: Pasted flat type with patent high rate formula of AM
- Terminal: two or more types of terminals are convenient for the selection
- Safety valve: flame filter is equipped with a safety valve system
- Separator: using an improved AGM separator, makes lower resistance and higher assembling pressure to increase deep cycle life.
- Battery case: made of high strength ABS(UL94-HB) and UL94-V0 is optional
- Terminal sealing: double sealing technic (mechanical + epoxy glue)

SERVICE LIFE: 300 CYCLES DOD 80%



APPLICATIONS



UPS



Medical



Telecom

TECHNICAL INFORMATION

For more details about layouts & terminals, flip to page 75 for more information.

GENERAL FEATURES

- High corrosion resistant performance: Pb-Ca multi-alloy grid
- High energy density and power density
- Optimized capability of instant high-current discharging
- Excellent charge acceptance ability
- Excellent deep cycle discharge capability
- Strong high and low temperature performance
- Precision sealing technology
- Long life



Reference	Voltage (V)	Capacity (Ah/ C20)	Capacity (Ah/ C10)	Capacity (Ah/ C1)	Dimensions (mm)			Weight (kg)	Layout	Terminals
					X	Y	H			
DAB12-36HR	12	9	8,5	5,9	151	65	100	2,60	3	T2
DAB12-48HR	12	14	13,2	7,8	151	98	101	3,15	3	T2
DAB12-88HR	12	22	20,8	14,4	181	77	167	6,20	0	M5
DAB12-102HR	12	26	23,6	16,8	175	166	125	8,55	0	M5
DAB12-110HR	12	28	25,5	15,4	166	125	175	8,90	0	M5
DAB12-380HR	12	100	94,4	65,9	328	172	220	30,50	1	M8

Stationary

AGM - DAS

**100%
maintenance
free**

Valve regulated lead-acid (VRLA) batteries for general purpose applications with stable performance. Suitable for power supply in different industries or backup power supply equipment.



5 year Life Design "Floating Use"
VRLA: Valve Regulated Lead-Acid
SLA: Sealed Lead-Acid
AGM: Absorbed Glass Matt

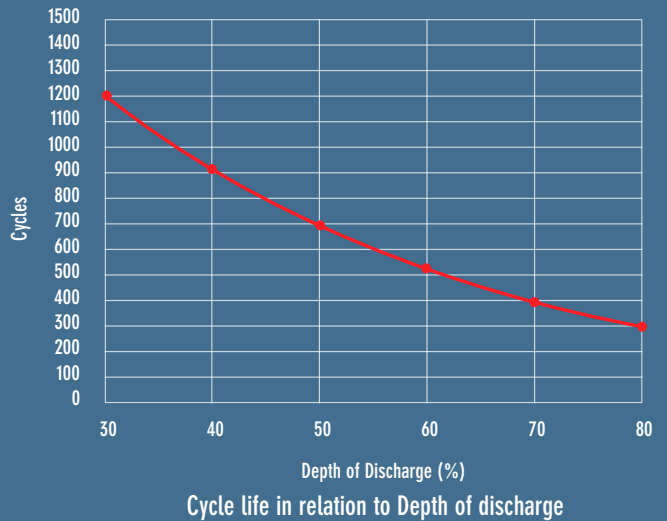
BENEFITS

- Maintenance free, sealed structure
- 5Y designed floating service life @ 25°C
- Stable performance
- Low internal resistance
- Good high-rate discharge performance
- ≤ 3% monthly self-discharge rate

TERMINALS AND ADAPTORS

- BAT/42019 - J-type adaptor M6 (one set is 2 adaptors)
- BAT/33955 - automot. adaptor M6 (one set is 2 adaptors)
- BAT/33956 - automot. adaptor M8 (one set is 2 adaptors)

SERVICE LIFE: 300 CYCLES DOD 80%



APPLICATIONS



Emergency lighting



Fire & security



General purpose



Medical



UPS



Telecom



Alarm

TECHNICAL INFORMATION

For more details about layouts & terminals, flip to page 75 for more information.



Ref.	Voltage (V)	Capacity (Ah/ C20)	Capacity (Ah/ C5)	Dimensions (mm)			Weight (kg)	Lay-out	Terminals
				X	Y	H			
4V									
DAS4-4.5	4	4,0	3,5	47	47	107	0,50	1	T1
6V									
DAS6-1	6	1,2	1,1	98	25	53	0,25	1	T1
DAS6-1.3	6	1,3	1,1	98	25	53	0,30	1	T1
DAS6-3.2	6	3,2	2,8	125	35	63	0,63	1	T1
DAS6-4.5	6	4,5	3,9	71	47	101	0,75	1	T1
DAS6-7.2	6	7,0	6,1	151	34	97	1,10	1	T2
DAS6-10	6	10,0	8,7	151	50	94	1,55	1	T1
DAS6-12	6	12,0	10,5	151	50	94	1,75	1	T2
DAS6-14	6	14,0	11,9	108	71	140	2,26	4	T1
12V									
DAS12-0.8	12	0,8	0,7	96	25	62	0,36	cable & bullet conn.	
DAS12-1.3	12	1,3	1,1	98	43	53	0,56	4	T1
DAS12-2.2	12	2,2	1,9	177	35	60	0,88	1	T1
DAS12-2.6	12	2,6	2,3	70	47	107	0,80	1	T1
DAS12-2.9	12	2,9	2,5	79	55	105	1,10	0	T1
DAS12-3.3	12	3,3	2,9	135	67	65	1,25	4	T1
DAS12-5	12	5,0	4,4	90	70	101	1,58	3	T1
DAS12-7.5	12	7,5	6,6	152	65	100	2,02	3	T1
DAS12-9	12	9,0	7,9	152	65	100	2,54	3	T2
DAS12-12	12	12,0	10,5	151	99	101	3,45	3	T2
DAS12-14	12	14,0	11,9	150	98	99	4,18	3	T2
DAS12-18	12	18,0	15,7	181	77	167	5,10	0	M5
DAS12-18 AL	12	18,0	15,3	181	77	167	4,90	0	FLAG
DAS12-26	12	26,0	22,6	166	175	125	7,70	0	M5
DAS12-33	12	35,6	30,1	195	130	167	10,00	1	M6
DAS12-44	12	48,4	41,0	197	165	172	14,50	0	M6
DAS12-70	12	65,0	55,0	349	167	179	23,60	0	M8

VRLA-AGM DAS FR-SERIES

Valve regulated lead-acid (VRLA) batteries for standby applications (floating use) such as UPS systems, emergency centres, telephone exchanges, medical applications, solar panels, navy navigation,

FLAME RETARDANT UL94-V0 CASING

UL 94, the Standard for Safety of Flammability of Plastic Materials for Parts in Devices and Appliances testing, is a plastics flammability standard released by Underwriters Laboratories of the United States.

The standard determines the material's tendency to either extinguish or spread the flame once the specimen has been ignited.

V-0: burning stops within 10 seconds on a vertical specimen; drips of particles allowed as long as they are not inflamed.



Ref.	Voltage (V)	Capacity (Ah/ C20)	Capacity (Ah/ C5)	Dimensions (mm)			Weight (kg)	Lay-out	Terminals
				X	Y	H			
12V									
DAS12-1.3FR	12	1,2	1,1	97	43,0	58	0,60	4	T1
DAS12-2.2FR	12	2,3	1,7	178	34,5	67	0,90	1	T1
DAS12-5FR	12	5,0	4,3	90	70,0	107	1,49	3	T1
DAS12-7.5FR	12	7,0	6,0	151	65,0	101	2,00	3	T1
DAS12-12FR	12	12,0	10,2	151	98,0	101	3,20	3	T2
DAS12-18FR	12	18,0	15,3	181	77,0	166	5,15	0	M5
DAS12-26FR	12	26,0	22,1	166	175,0	125	8,00	0	M5

Stationary

GEL

**100%
maintenance
free**

By combining the newly developed Nanometer Gel electrolyte, high tin content cathode plate and AGM separator, the DGY series battery enjoys excellent discharging performance, long cycle life and stable performance at high and low temperature environments. DGY series is suited for all kinds of ranges for energy storage, especially for renewable energy systems etc.

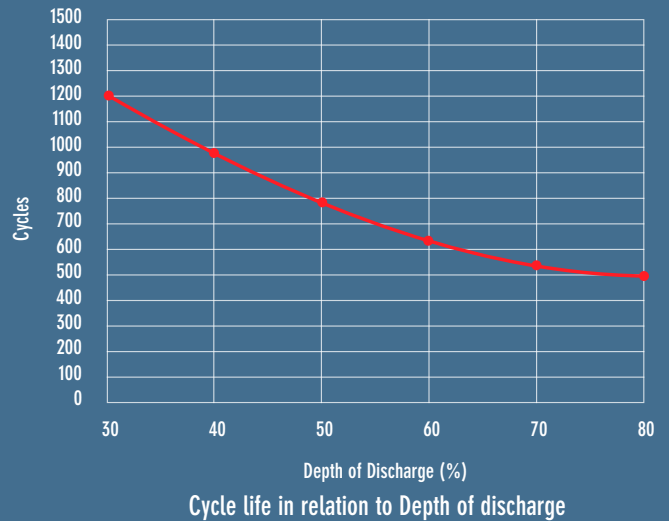


15 year Life Design "Floating Use"
VRLA: Valve Regulated Lead-Acid
SLA: Sealed Lead-Acid
AGM: Absorbed Glass Matt

BENEFITS

- Sealed design, free of maintenance
- 15 years design life "Floating Use" @ 25°C/68°F
- Wide operating temperature range: -15°C to 35°C
- Nanometer gel electrolyte eliminates acid stratification and prolongs cycle life
- Low self-discharge rate: ≤3%/month

SERVICE LIFE: 500 CYCLES DOD 80%



APPLICATIONS



UPS



Telecom



Railway



Wind energy



Solar

TECHNICAL INFORMATION

For more details about layouts & terminals, flip to page 75 for more information.

GENERAL FEATURES

- Nanosilica colloidal electrolyte combined with high tin positive plate alloy design enhances battery performance
- Relatively rich electrolyte, high and low temperature performance is superior.
- Long cycle life
- Excellent charge acceptance ability
- Precision sealing technology



Ref.	Voltage (V)	Capacity (Ah/ C20)	Capacity (Ah/CS)	Dimensions (mm)			Weight (kg)	Lay-out	Terminals
				X	Y	H			
6V									
DGY6-110	6	100,0	86,0	194	170	212	16,5	1	M8
DGY6-160	6	189,0	157,0	298	171	229	26,9	1	M8
DGY6-180	6	210,0	187,0	260	180	276	29,5	0	M8 + 1
DGY6-200	6	248,0	220,0	322	178	231	34,0	1	M8
DGY6-225	6	242,0	205,5	243	188	275	32,0	0	1
8V									
DGY8-180	8	157,0	128,0	260	182	298	36,4	1	DT 1 + 8
12V									
DGY12-7.5	12	8,5	7,9	151	65	103	2,3	3	T1
DGY12-13	12	12,0	10,4	151	98	100	3,8	3	T2
DGY12-18	12	18,0	15,6	181	77	167	5,5	0	M5
DGY12-26	12	26,0	22,1	166	176	125	8,0	0	M5
DGY12-33	12	36,4	28,3	195	130	160	10,2	1	M6
DGY12-44	12	45,4	36,8	198	167	158	13,5	0	M6
DGY12-55	12	59,0	49,1	229	138	208	16,5	1	M6
DGY12-60	12	71,6	57,7	260	168	180	22,1	1	M6
DGY12-65	12	75,0	61,1	279	175	190	22,7	0	M6
DGY12-70J	12	69,6	58,5	350	166	175	21,0	0	M6
DGY12-80	12	87,0	78,0	260	168	211	24,0	1	M6
DGY12-100	12	105,0	99,0	307	168	214	30,7	1	M8
DGY12-110	12	123,0	110,0	330	172	214	32,0	1	M8
DGY12-150	12	161,4	136,5	483	170	241	45,0	1	M8
DGY12-160	12	180,0	155,0	532	207	219	53,0	4	M8
DGY12-200	12	214,0	178,5	522	240	222	62,5	4	M8
DGY12-225	12	263,0	216,0	521	269	208	74,5	4	M8

Stationary

NiFe ALKALINE

These NiFe batteries are standby batteries especially designed for photovoltaic systems. It is made of Nickel hydroxide and iron oxide plates.

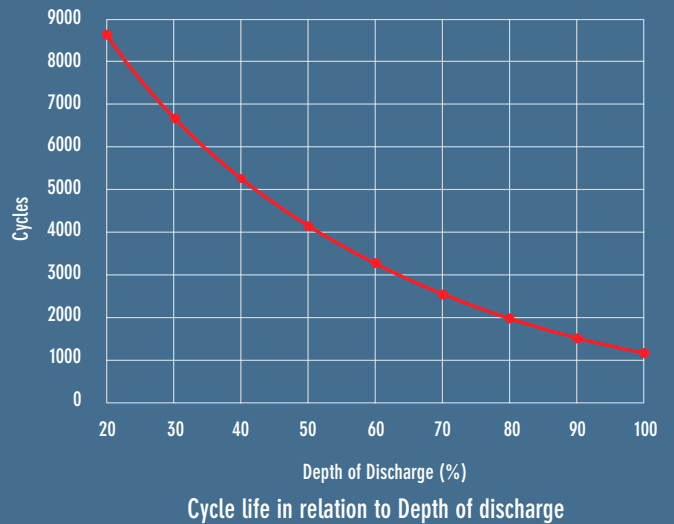
The wide operating temperature range from -20 °C to 60 °C, mechanical and electrical abuse and deep discharges are no problem. There is no acid so the battery will not corrode and it will still work after being discharged for longer time.



BENEFITS

- Long cycle life
- Low operation cost
- Environmentally friendly (no lead, cadmium or acid) & recyclable
- High/low temperature possible (Almost no possibility of burning or thermal runaway)
- High safety, high reliability, low maintenance
- Higher charge ratio and utilization ratio
- Easy to transport & install in remote and harsh areas
- No corrosion, no risk of "sudden death"
- Abnormal operation acceptable
- True 20+ years design life

SERVICE LIFE: 2000 CYCLES DOD 80%



APPLICATIONS



Railway



Telecom



Solar



UPS

TECHNICAL INFORMATION

For more details about layouts & terminals, flip to page 75 for more information.



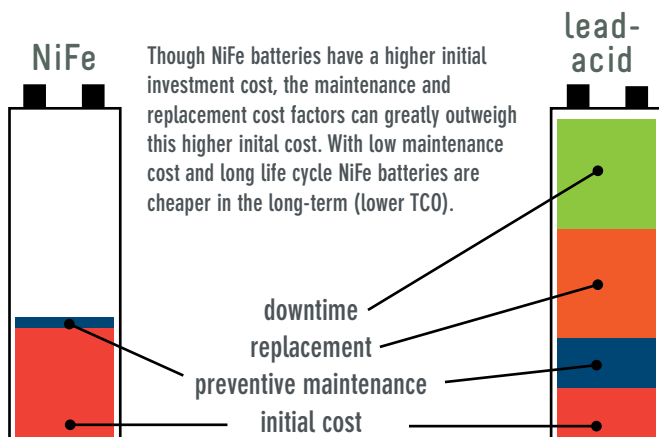
Ref.	Voltage (V)	Capacity (Ah/CS)	Dimensions (mm)			Weight (kg)	Terminals
			X	Y	H		
NiFe10-S	1,2	10	40	85	150	0,80	M8
NiFe20-S	1,2	20	55	134	270	1,65	M8
NiFe30-S	1,2	30	55	134	270	1,75	M10
NiFe40-S	1,2	40	70	140	295	3,30	M10
NiFe50-S	1,2	50	70	140	295	3,60	M10
NiFe60-S	1,2	60	80	140	295	4,13	M10
NiFe70-S	1,2	70	80	140	295	4,45	M10
NiFe80-S	1,2	80	80	140	295	4,51	M10
NiFe100-S	1,2	100	80	140	365	6,00	M10
NiFe120-S	1,2	120	80	140	365	6,20	M10
NiFe150-S	1,2	150	165	167	354	8,50	M20
NiFe200-S	1,2	200	165	167	354	9,50	M20
NiFe250-S	1,2	250	170	285	350	20,40	2 x M20
NiFe300-S	1,2	300	170	285	350	21,00	2 x M20
NiFe350-S	1,2	350	170	285	350	21,50	2 x M20
NiFe400-S	1,2	400	140	280	490	24,60	2 x M20
NiFe500-S	1,2	500	175	285	490	33,40	2 x M20
NiFe600-S	1,2	600	175	285	490	34,70	2 x M20
NiFe700-S	1,2	700	185	395	560	52,60	3 x M20
NiFe800-S	1,2	800	185	395	560	55,00	3 x M20
NiFe900-S	1,2	900	185	395	560	57,00	3 x M20
NiFe1000-S	1,2	1000	185	395	560	59,00	3 x M20

MAIN RANGES OF APPLICATION

Thanks to the outstanding characteristics, the NiFe batteries have replaced the lead-acid batteries in a wide range of applications, especially for solar PV and renewable energy power systems. Suitable for commercial and residential buildings, railway and light trains (crossing gates, lighting & signage), navigation aids like remote lighthouses, beacons, offshore. Also utilities like electric power supply for remote areas and islands can use these batteries. And so do oil and gas fields (emergency lighting on offshore platforms and cathodic protection for pipelines) and telecommunication systems (base stations, radio repeaters, emergency telephones, ...)

Speaking of a wide range of applications!

COST EFFECTIVENESS



COMPARISATION VRLA ↔ NiFe

Characteristics	Lead acid battery	NiFe batterie
Nominal voltage	2V	1.2V
Floating charge volt.	2.23V~2.3V/cell	1.45V~1.5V/cell
Temperature factor during floating charge	-3mV/°C per cell	-3mV/°C per cell
Operating voltage	Average	Good
Standard charge and discharge current	0.1A (C10)	0.25A (C5)
High rate discharge performance	Poor	Good
Overcharge performance	Poor	Good
Over discharge performance	Extremely poor	Good
Effect from floating charge voltage	When charge voltage > 2.35V/cell then service life reduced by 1/2 for every 0.1V/cell increase	Not affected
Operation life	3 years	20 years
Storage life	2 years	4 years
High temperature performance	temp > 50°C = capacity decrease which affect the service life	Not affected
Low temperature performance	will affect the service life	Little effect on the service life
Thermal danger if shorted	Yes	No
Premature capacity loss	Yes	No
Environmentally friendly	No	Yes

Stationary

NICD

NICD POCKET PLATE M-RANGE

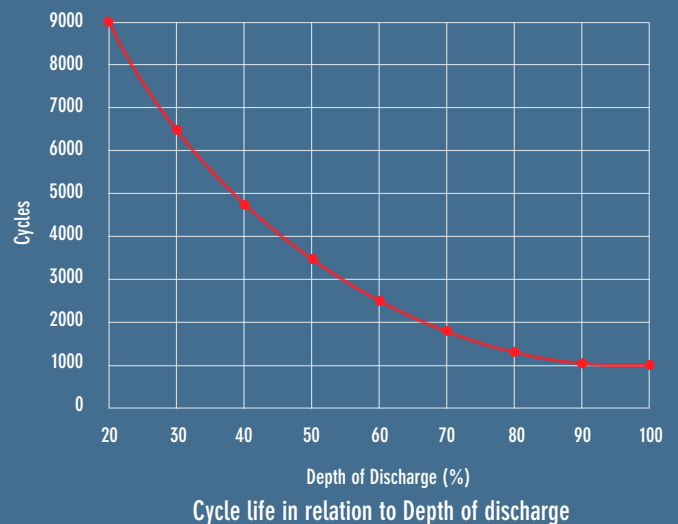
M-Series Medium Discharge Rate nickel cadmium battery is made of pocket plate. The battery is suitable for medium discharge periods between 30 minutes and 5 hours such as standby for UPS, gas turbine control. etc.



BENEFITS

- Easy storage & installation
- Low maintenance
- Deep cycle ability
- Wide operating temperature range (-40°C to +70°C)
- Superior reliability
- Excellent fast charging ability
- Long service life
- Assured quality
- Prolonged warranty

SERVICE LIFE: 1300 CYCLES DOD 80%



APPLICATIONS



Railway



Telecom



Solar



UPS



Marine

TECHNICAL INFORMATION

For more details about layouts & terminals, flip to page 75 for more information.



Ref.	Voltage (V)	Capacity (Ah/CS)	Dimensions (mm)			Weight (kg)	Terminals
			X	Y	H		
M-series - Medium Discharge Rate Type							
NiCd10-M	1,2	10	43	85	260	1,20	M10
NiCd20-M	1,2	20	55	134	270	1,90	M10
NiCd30-M	1,2	30	55	134	270	2,40	M10
NiCd40-M	1,2	40	60	140	270	3,60	M10
NiCd50-M	1,2	50	70	140	295	4,20	M16
NiCd60-M	1,2	60	70	140	295	4,40	M16
NiCd70-M	1,2	70	70	140	295	4,60	M16
NiCd80-M	1,2	80	80	140	365	6,50	M16
NiCd90-M	1,2	90	80	140	365	6,70	M16
NiCd100-M	1,2	100	105	165	345	9,20	M20
NiCd120-M	1,2	120	105	165	345	9,50	M20
NiCd150-M	1,2	150	165	167	345	12,50	M20
NiCd200-M	1,2	200	165	167	345	14,00	M20
NiCd250-M	1,2	250	140	280	450	21,50	2 x M16
NiCd300-M	1,2	300	140	280	450	22,50	2 x M16
NiCd350-M	1,2	350	170	285	350	24,00	2 x M20
NiCd400-M	1,2	400	175	285	500	32,00	2 x M20
NiCd500-M	1,2	500	175	285	500	37,00	2 x M20
NiCd600-M	1,2	600	175	285	500	40,00	2 x M20
NiCd700-M	1,2	700	186	398	565	55,00	3 x M20
NiCd800-M	1,2	800	186	398	565	58,00	3 x M20
NiCd900-M	1,2	900	186	398	565	61,00	3 x M20
NiCd1000-M	1,2	1000	186	398	565	64,00	3 x M20
NiCd1100-M	1,2	1100	186	398	565	66,00	3 x M20

TECHNICAL INFORMATION

Layout					
0	1	2	3		
4	6	9	6 Volt: 0	6 Volt: 1	
Terminals					
Flag	T1	T2	M5	M6	M8

Heights		
T1, T2	M5, M6, M8*	1, 3, Flag,...
*Height without bolt.		

Dimensions are overall dimensions including the terminals

Chargers

ZIVAN - HIGH-FREQUENCY CHARGERS

THE ELECTRONIC CHARGER OF THE FUTURE FOR ALL TYPES OF BATTERIES!



 **ZIVAN**[®]
HIGH FREQUENCY BATTERY CHARGERS

**HIGH
FREQUENCY**
0,5 → 36kW

CHARACTERISTICS HIGH FREQUENCY

All Zivan high frequency chargers work in accordance with the principle of SMPS (Switching Mode Power Supply)

Principle: the 220 volt AC or 3 x 380V.AC of the network comes to an EMI filter. The filter is located behind the diode bridge. The mains voltage is rectified and then sufficiently smoothed (= AC / DC conversion). This high DC voltage arrives at the primary side of the transformer. The transformer for its part is switched by one or more mosfet(s) or power transistor(s). At the gate or base of the power components, a pulse-counting signal (PWM = Pulse Width Modulation) arrives. This PWM signal causes the cutting of the high input voltage with a **high frequency**. The PWM signal is supplied by the control stage which is on its part controlled by the control logic, which gets the information at the battery side. By switching the power component on the primary side of the transformer, there's a pulse shaped signal at the secondary side, which is rectified backward to a much lower voltage (V) than those at the primary side but with a higher current value (A). Before this current is brought to the battery it passes again through an EMI filter which eliminates the last differences of tension and suchlike.

Result: There's always a constant current to the battery, independent of the variations on the mains voltage.

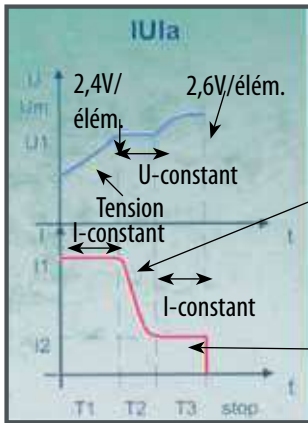
FUNCTIONING OF A ZIVAN HIGH FREQUENCY CHARGER

Controlled recharging = recharging according to the state of discharge. The Zivan charger controls constantly the tension of your battery! The charger starts with a maximum charging current until the battery reaches 2.4V/cell. When the 2.4V/cell is reached, the current drops back and the charger starts to charge the battery with a charging current which comes to 4 % of the battery capacity.

So: The charge of your battery is always adapted to the state of discharge -> the more your battery is discharged, the longer is the charge time; the less discharged, the shorter the charge time!

Maximum efficiency: Saving of approximately 25 % on your energy bill. Thanks to the use of a microprocessor which controls permanently the depth of discharge and the state of charge of your battery, the energy consumption is reduced during the charge cycles, as the charger only delivers the current needed to charge the discharged part of the battery! Also, the classic transformer is replaced by a special transformer in a HF-charger: this means less loss of warmth --> less energy loss --> more efficiency.

Advantages: less heating of the battery = less energy & water consumption!



IU1a: IU1a: Constant I - constant U - constant I - turn off

The current decreases: to keep and not to increase the 2,4V/elem.: less water consumption.

Final charge: 4% of the battery capacity

I = current (ampere)

U = tension (volt)

1Kw
Transformer
Classical charger

±0,75
Significant loss of warmth!

1Kw
Transformer
HF-Charger

±0,85
Almost no loss of warmth!

WHY DO HIGH FREQUENCY BATTERY CHARGERS HAVE SUCCESS?

- Because they guarantee several advantages if compared to the traditional technology ones, above all because we're talking about "CONTROLLED" battery chargers.
- What's the meaning of "CONTROLLED"?
It means that the battery charger is able to make the optimal recharge by succeeding in controlling and adjusting the current, the voltage and all the charging parameters as stated by the batteries manufacturers.

MULTI-CURVE ZIVAN: VERSATILE, EFFICIENT RELIABLE

Flexible and intuitive to use: same item may recharge multiple battery chemistries and a wide window of battery capacities. This means reduction of the number of part numbers in customer warehouse and less references on the IT system.

By an easy adjustment, the most suitable charging profile (cyclic traction charge including week end equalization, maintenance floating charge, power supply stationary charge, other peculiar to implement) fitting to specific application {material handling: lift trucks, pallet trucks, aerial platforms, UPS& telecom systems, boating, solar, windmills, EV, NEV, AGV, LGV, industrial cleaning}.

CAN BUS INTERFACE NEW RANGE: ADDITIONAL FEATURES

- Chargers units are parallelable
- Insulated can bus communication
- Data logging and clock calendar
- Storage up to 1500 cycles (corresponding to battery standard lifetime)
- Can open function: charger can work with run time parameters controlled by external devices (e.g. BMS - PC - Vehicle Master controller)
- Dynamic compensation of the voltage drop on the output cable
- Digital display shows parameters: voltage, current, charged Ah, and time left to the end of the charge
- Suitable for several battery types (Lead acid, gel, Li-Ion ...)
- Flashable micro controller

HIGH FREQUENCY ADVANTAGES

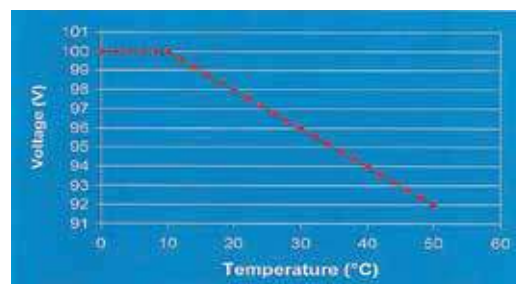
- Exceptional charging quality.
- Up to 15% of saving on the charging costs on the energy invoice.
- Water consumption almost halved.
- Battery maintenance reduced of about 50%.
- Gas emissions reduced (lower risk of explosion).
- Weight and size about 10 times reduced:
➔ Every battery charger can be built-in.

THERMAL SENSOR OPTION:

By using the thermal sensor option, the charge profile is automatically adjusted and compensated based on the battery temperature.

It is warmly suggested when the battery often works in stress conditions and/or when the climate environment is characterized by important modifications during the year.

VARIATION OF GASIFICATION VOLTAGE FOR A 80V BATTERY BASED ON BATTERY TEMPERATURE



The thermal sensor prevents damages to the battery. If an element is faulty, the rest of the battery is safeguarded.

The charger automatically stops the charge if the temperature of the battery increases above a predetermined value.

Temperature effect: As you know life of the battery is shortened if it works at higher temperatures. By using the Zivan HF charger battery life is extended.

Chargers

ZIVAN - HIGH-FREQUENCY CHARGERS

Reference	Volts	Amp	IMAX	Charging time (Ah/C5)			L	W	H	Ah	
				7-8,5h	9-11h	12-13h				From	To
UBC 12/18	12	15,0	18,0	70-95	120		235	115	65	70	120
BC1 12/35	12	30,0	36,0	145	190	240	285	105	75	145	240
NG1 12/60	12	50,0	60,0	240-360	400-480	520-560	300	160	80	240	560
UBC 24/6	24	6,0		45	50	55	235	115	65	45	55
UBC 24/15	24	12,5	15,0	80	100	125	235	115	65	80	125
BC1 24/30	24	25,0	30,0	200	250	300	285	105	75	200	300
NG1 24/30-35	24	30,0	36,0	145-215	240-290	310-335	300	160	80	145	335
NG1 24/40-45	24	37,5	45,0	180-270	300-360	390-420	300	160	80	180	420
NG3 24/60	24	50,0	60,0	240-360	400-480	520-560	430	220	110	240	560
NG3 24/80-95	24	80,0	96,0	385-575	640-770	830-895	430	220	110	385	895
NG3 24/100	24	100,0	100,0	480-720	800-960	1040-1120	430	220	110	480	1120
NG5 24/100	24	100,0	120,0	480-720	800-960	1040-1120	545	265	115	480	1120
NG9 24/120	24	120,0	144,0	575-865	960-1150	1250-1345	545	265	115	575	1345
NG9PLUS 24/200	24	120,0	200,0	960-1440	1600-1920	2080-2240	545	265	115	960	2240
NG1 36/20-25	36	20,0	24,0	95-145	160-190	210-225	300	160	80	95	225
NG3 36/60	36	50,0	60,0	290-430	480-575	625-670	430	220	110	290	670
NG9 36V 145A	36	120,0	144,0	575-865	960-1150	1250-1345	545	265	115	575	1345
NG9PLUS 36/200	36	170,0	170,0	815-1225	1360-1630	1770-1905	545	265	115	815	1905
NG1 48/15-18	48	18,0	21,6	85-130	145-175	185-200	300	160	80	85	200
NG3 48/45	48	36,0	43,2	175-260	290-345	375-405	430	220	110	175	405
NG3 48/60	48	50,0	60,0	240-360	400-480	520-560	430	220	110	240	560
NG5 48/80-95	48	80,0	96,0	385-575	640-770	830-895	545	265	115	385	895
NG7 48/120	48	100,0	120,0	480-720	800-960	1040-1120	545	265	115	480	1120
NG9 48V 145A	48	120,0	144,0	575-865	960-1150	1250-1345	545	265	115	575	1345
NG9PLUS 48/160	48	135,0	160,0	650-970	1080-1295	1405-1510	545	265	115	650	1510
BG15 48V 270A	48	225,0	270,0	1260-1620	1800-2160	2340-2520	767	362	540	900	2520
NG1 72/10-12	72	10,0	12,0	50-70	80-95	105-110	300	160	80	50	110
NG3 72/35	72	30,0	36,0	145-215	240-290	310-335	430	220	110	145	335
NG5 72/55-65	72	55,0	66,0	265-395	440-530	570-615	545	265	115	265	615
NG7 72/70-85	72	70,0	84,0	335-505	560-670	730-785	545	265	115	335	785
NG9 72/100-110	72	90,0	108,0	430-650	720-865	935-1010	545	265	115	430	1010
NG5 80/50-60	80	50,0	60,0	240-360	400-480	520-560	545	265	115	240	560
NG7 80/65-75	80	62,5	75,0	300-450	500-600	650-700	545	265	115	300	700
NG9 80/80-100	80	80,0	96,0	385-575	640-770	830-895	545	265	115	385	895
NG9PLUS 80/120	80	100,0	120,0	480-640	800-960	960-1120	545	265	115	480	1120
BG15 80V 160A	80	135,0	160,0	750-960	1070-1290	1390-1500	767	362	540	536	1500

Options for chargers

Reference

Pump

Standard reference + P

NG1 / NG3 & NG5 & NG7 & NG9 & NG9PLUS & IP54

The UBC e BC1 item references refer to lead acid traction batteries WUIA curve only.

The recharging times are purely indicative and refer to batteries discharged at the 80% of their capacities.

BATTERY CHARGER OVERVIEW

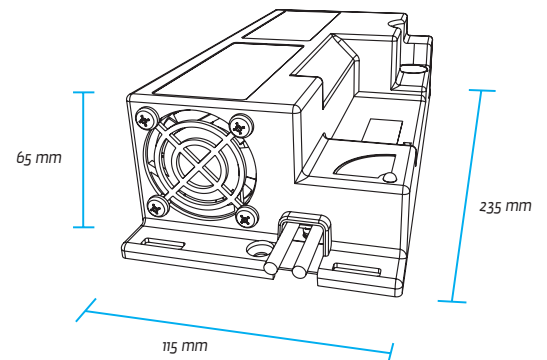


420V									
250V									
72/80V									
36/48V									
24V									
12V									
	0,5 kW	0,7 kW	1 kW	3 kW	5 kW	9 kW	18 kW	36 kW	

Chargers

ZIVAN - HIGH-FREQUENCY BATTERY CHARGERS

UBC BATTERY CHARGER SINGLE-PHASE



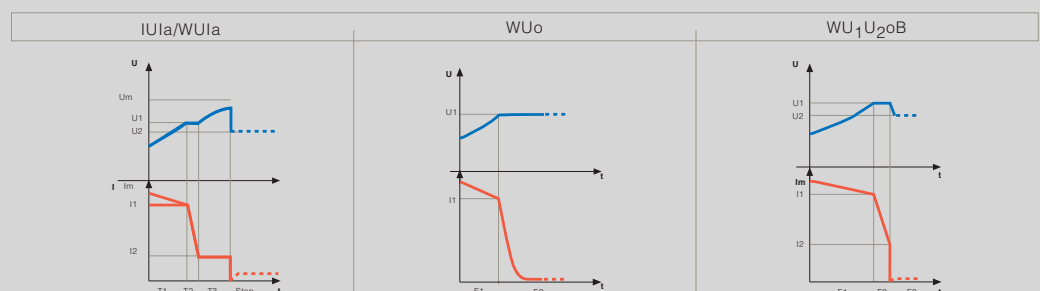
UBC SINGLE PHASE

The Single Phase Battery Charger UBC is an innovative device with extraordinary versatility, reliability and efficiency. Different software may be installed to change the charging features and adapt them to every kind of battery. Due to its size and light weight, this model is especially suitable for on-board installation, in addition to the "on wall" installation. Consequently, the machine can be recharged from any available outlet, without driving the machine to a specific charging area.

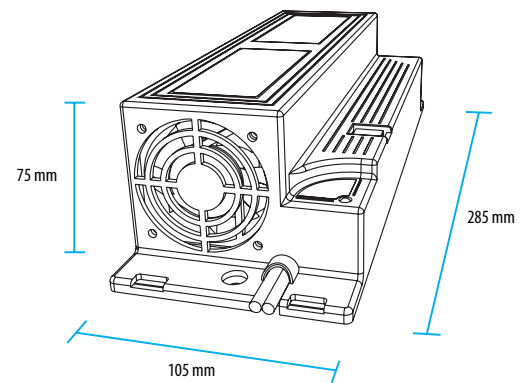
TECHNICAL FEATURES

- Input voltage: 230 VAC \pm 10%
115 VAC \pm 10%
- Input frequency: 50 – 60 Hz
- Efficiency: > 85%
- Current absorbed by the battery: < 1 mA
- Operating temperature: from -20 to $+50^{\circ}\text{C}$
- Output short-circuit protection (fuse)
- Inverse polarity protection (fuse)
- Accuracy on output voltage: \pm 0,5%
- Cooling: forced
- Case: metal base, cover in self-extinguishable ABS
- Size: 235 x 115 x 65 mm
- Weight: 0,850 kg
- Enclosure class: IP20
- **CE** In conformity with the requirements of the Low Voltage Directive and of the Directive EMC.
- Vibration Test: Sinusoidal vibrations (referring regulation IEC 68-2-6); Shock Test (referring regulation IEC 68-2-27); Bump Test (referring regulation IEC 68-2-29).
- Options: adjustable charging curves or battery capacity

Battery Voltage	Charging time			Type	VAC	I1	IMAX	Mains
	7-8,5 h	9-11 h	12-13 h					
12	70-95	120		12V 18A	230	15	18	2
24	80	100	125	24V 15A	230	12,5	15	3



BC1 BATTERY CHARGER SINGLE-PHASE



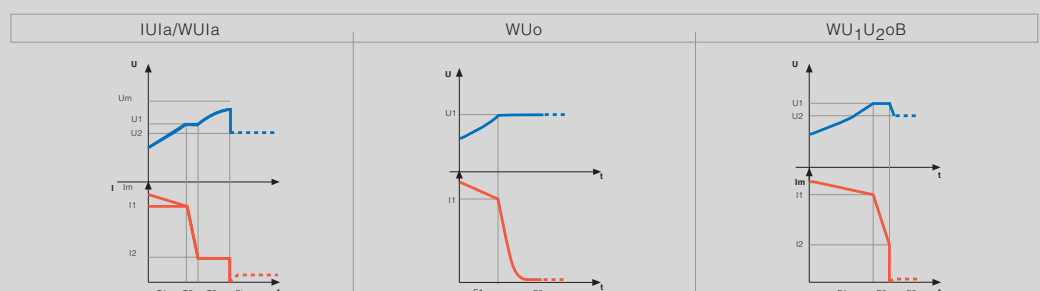
BC1 SINGLE PHASE

The Single Phase Battery Charger BC1 is an innovative device with extraordinary versatility, reliability and efficiency. Different software may be installed to change the charging features and adapt them to every kind of battery. Due to its size and light weight, this model is especially suitable for on-board installation, in addition to the "on wall" installation. Consequently, the machine can be recharged from any available outlet, without driving the machine to a specific charging area.

TECHNICAL FEATURES

- Input voltage: 230 VAC \pm 10%
- Input frequency: 50 – 60 Hz
- Efficiency: > 85%
- Current absorbed by the battery: < 1 mA
- Operating temperature: from -20 to $+50^{\circ}\text{C}$
- Output short-circuit protection (fuse)
- Inverse polarity protection (fuse)
- Accuracy on output voltage: \pm 0,5%
- Cooling: forced
- Case: metal base, cover in self-extinguishable ABS
- Size: 285 x 105 x 75 mm
- Weight: 1,390 kg
- Enclosure class: IP20
- **CE** In conformity with the requirements of the Low Voltage Directive and of the Directive EMC.
- Vibration Test: Sinusoidal vibrations (referring regulation IEC 68-2-6); Shock Test (referring regulation IEC 68-2-27); Bump Test (referring regulation IEC 68-2-29).
- Options: adjustable charging curves or battery capacity

Battery Voltage	Charging time			Type	VAC	I1	IMAX	Mains
	7-8,5h	9-11h	12-13h					
12	145	190	240	12V 35A	230	30	36	3
24	200	250	300	24V 30A	230	25	30	5



Chargers

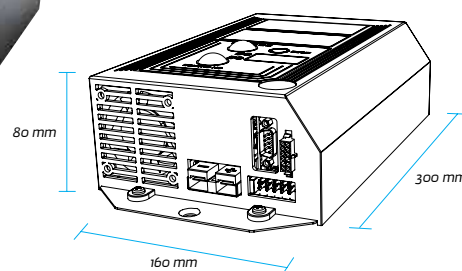
ZIVAN - HIGH-FREQUENCY CHARGERS

NG1 CAN BUS BATTERY CHARGER SINGLE-PHASE

POWER IS COMMUNICATION

NG1 CAN BUS

The new single-phase battery charger with CAN BUS interface represents an innovation in Zivan's range. Its powerful "flash" microcontroller, with integrated CAN-BUS interface, paves the way for communication with other devices such as the controller, BMS, PC, DISPLAYS, etc.; allowing integration into the most advanced systems. Large onboard memory provides access to relevant items of the charge history, thereby increasing the charger's performance and flexibility. Using a single button on the optional display, it is easy to modify charging features and parameters allowing correct matching to any type of battery (including Lithium technologies). The high power and efficiency of Zivan's chargers guarantees significant energy savings and subsequent economic advantage. All of these features position ZIVAN as leaders in the market, providing state-of-the-art technology and high quality while maintaining a competitive price.



TECHNICAL FEATURES

- Insulated CAN BUS Interface
- Input voltage: 230 VAC \pm 10%
115 VAC \pm 10%
- Input frequency: 50 – 60 Hz
- Efficiency: > 85%
- Minimum power absorbed: < 5 W
- Current absorbed by the battery: < 0.2 mA
- Operating temperature: from – 20 to + 50°C
- Output short-circuit protection (fuse)
- Inverse polarity protection (fuse)
- Charging curve: programmable
- Accuracy on output voltage: \pm 0,5%
- Thermal compensation of battery voltage (optional with thermal sensor)
- Acoustic alarm
- Auxiliary contacts of main presence and end of charge (Standard Charger) or of air pump control and end of charge (Charger with air pump)
- Cooling: forced
- Case: Metal base, cover in self-extinguishable ABS
- Size: 300 x 160 x 80 mm
- Weight: 2,2 kg

- Enclosure class: IP20
- **CE** in conformity with the requirements of the Low Voltage Directive and of the Directive EMC.

INNOVATIVE FEATURES

- Powerful and flexible logic control with can bus connection option
- Data logging and clock calendar functions
- Storage of up to 1000 charging cycles
- Parallelable
- Can open function: charger can work with run-time parameters controlled by an external device (e.g. bms)
- Internet connection for remote managing & flashing
- Digital display shows parameters: voltage, current, charged Ah and time left to the end of charge
- Dynamic compensation of the voltage drop on the output cable
- Suitable for several battery types (Li-Ion, lead acid, gel, NiMH, etc.)

Battery Voltage	Charging time			Type	VAC	I1	Code	IMAX	Mains
	7 - 8,5 h	9 - 11 h	12 - 13 h						
12	240 - 360	400 - 480	520 - 560	12V 60A	230	50,0	GGAQCB-07040Q	60,0	5
24	145 - 215	240 - 290	310 - 335	24V 35A	230	30,0	GGBMCB-07040Q	36,0	7
	180 - 270	300 - 360	390 - 420	24V 50A	230	37,5	GGBOCB-07040Q	45,0	8
36	95 - 145	160 - 190	210 - 225	36V 25A	230	20,0	GGCHCB-07040Q	24,0	6
48	85 - 130	145 - 175	185 - 200	48V 22A	230	18,0	GGEHCVB-07040Q	21,6	6
72	50 - 70	80 - 95	105 - 110	72V 12A	230	10,0	GGHECB-07000Q	12,0	6

Further models are available for other battery voltages.

The recharging times are purely indicative and refer to batteries discharged at the 80% of their capacities.

Every model is available for acid circulation batteries (please, allocate the correct code in the Purchase Order).



Air pump
NG1 CAN BUS Murale

ACCESSORIES

Thermal sensor

Compensates the recharging parameters depending on battery temperature.

Zivan CAN console

Software for the visualization of charging parameters through PC.

PC CONNECTION KIT

USB to CAN adaptor

Cable for connecting battery charger to PC through ZIVAN Can Console.

Master-slave connection kit

Inter-connection cable for connecting more devices in parallel (available in the following versions: MASTER-SLAVE, MASTER-2 SLAVES, MASTER-3 SLAVES).

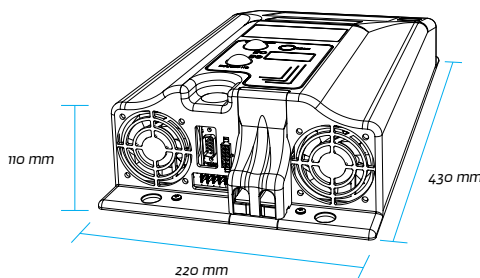
NG3 CAN BUS BATTERY CHARGER SINGLE-PHASE



POWER IS COMMUNICATION

NG3 CAN BUS

The new single-phase battery charger with CAN BUS interface represents an innovation in Zivan's range. Its powerful "flash" microcontroller, with integrated CAN-BUS interface, paves the way for communication with other devices such as the controller, BMS, PC, DISPLAYS, etc.; allowing integration into the most advanced systems. Large onboard memory provides access to relevant items of the charge history, thereby increasing the charger's performance and flexibility. Using a single button on the optional display, it is easy to modify charging features and parameters allowing correct matching to any type of battery (including Lithium technologies). The high power and efficiency of Zivan's chargers guarantees significant energy savings and subsequent economic advantage. All of these features position ZIVAN as leaders in the market, providing state-of-the-art technology and high quality while maintaining a competitive price.



TECHNICAL FEATURES

- Insulated CAN BUS Interface
- Input voltage: 230 VAC \pm 10%
115 VAC \pm 10%
- Input frequency: 50 – 60 Hz
- Efficiency: > 85%
- Minimum power absorbed: < 5 W
- Current absorbed by the battery: < 0,5 mA
- Operating temperature: from -20 to+ 50°C
- Output short-circuit protection (fuse)
- Inverse polarity protection (fuse)
- Charging curve: programmable
- Accuracy on output voltage: \pm 0,5 %
- Thermal compensation of battery voltage (optional with thermal sensor)
- Acoustic alarm
- Auxiliary contacts of main presence and end of charge (Standard Charger) or of air pump control and end of charge (Charger with air pump)
- Cooling: forced
- Case: Metal base, cover in self-extinguishable PST
- Size: 430 x 220 x 110 mm
- Weight: 5,5 kg
- Enclosure class: IP20
- **CE** In conformity with the requirements of the Low Voltage Directive and of the Directive EMC.



INNOVATIVE FEATURES

- Powerful and flexible logic control with can bus connexion option
- Data logging and clock calendar functions
- Storage of up to 1000 charging cycles
- Parallelable
- Can open function: charger can work with run-time parameters controlled by an external device (e.g. bms)
- Internet connection for remote managing & flashing
- Digital display shows parameters: voltage, current, charged Ah and time left to the end of charge
- Dynamic compensation of the voltage drop on the output cable
- Suitable for several battery types (Li-Ion, lead acid, gel, NiMH, etc.)

Battery Voltage	Charging time			Type	VAC	I1	Code	IMAX	Mains
	7 - 8,5 h	9 - 11 h	12 - 13 h						
12	480 - 720	800 - 960	1040 - 1120	12 100	230	100	G7AVCB-07050Q	100,0	11
	240 - 360	400 - 480	520 - 560	24 60	230	50	G7BQCB-07020Q	60,0	11
	335 - 505	560 - 670	730 - 785	24 85	230	70	G7BSCB-07030Q	84,0	15
	385 - 575	640 - 770	830 - 895	24 95	230	80	G7BTCB-07030Q	96,0	17
24	480 - 720	800 - 960	1040 - 1120	24 100	230	100	G7BVCB-07030Q	100,0	22
	240 - 360	400 - 480	520 - 560	36 60	230	50	G7CQCB-07020Q	60,0	16
36	290 - 430	480 - 575	625 - 670	36 70	230	60	G7CRCB-07020Q	72,0	19
	175 - 260	290 - 345	375 - 405	48 45	230	36	G7ENCB-07020Q	43,2	16
48	240 - 360	400 - 480	520 - 560	48 60	230	50	G7EQCB-07020Q	60,0	22
	105 - 160	175 - 210	230 - 245	72 25	230	22	G7HICB-07020Q	26,4	14
72	145 - 215	240 - 290	310 - 335	72 35	230	30	G7HMCB-07020Q	36,0	19
	105 - 160	175 - 210	230 - 245	80 25	230	22	G7IICB-07000Q	26,4	16
80	130 - 195	215 - 260	280 - 300	80 30	230	27	G7ILCB-07020Q	32,4	19

Further models are available for other battery voltages.

The recharging times are purely indicative and refer to batteries discharged at the 80% of their capacities.

Every model is available for acid circulation batteries (please, allocate the correct code in the Purchase Order).



**Air pump
NG3 CAN BUS Murale**

ACCESSORIES

Thermal sensor

Compensates the recharging parameters depending on battery temperature.

Zivan CAN console

Software for the visualization of charging parameters through PC.

PC CONNECTION KIT

USB to CAN adaptor

Cable for connecting battery charger to PC through ZIVAN Can Console.

Master-slave connection kit

Inter-connection cable for connecting more devices in parallel (available in the following versions: MASTER-SLAVE, MASTER-2 SLAVES, MASTER-3 SLAVES).

Chargers

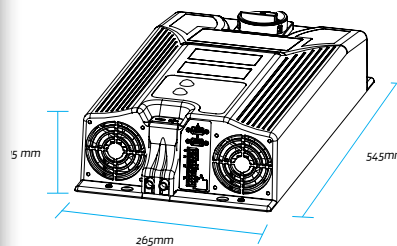
ZIVAN - HIGH-FREQUENCY CHARGERS

NG5/NG7/NG9 CAN BUS BATTERY CHARGER THREE-PHASE

POWER IS COMMUNICATION

NG5/NG7/NG9 THREE PHASE

The new three-phase battery charger with CAN BUS interface represents the innovation in Zivan's range. Thanks to a "flash" microprocessor endowing with high calculation power and huge storage capacity it is able to view in historical perspective the main data concerning last recharging cycles, elevating its feasibility and performance. By a sole button it is easy to modify the charging features, visualize them on the display and fit them to any type of battery. The high power and efficiency of these Zivan's chargers guarantee a significant energy saving and subsequent economic advantage. This allows to amortize within short times the investment on choosing high frequency, ranking these chargers among the leader items available on the market with the best relationship between quality and price.



TECHNICAL FEATURES

- Input voltage: 400 VAC \pm 15% Three Phase
- Input frequency: 50 – 60 Hz
- Efficiency: > 87%
- Minimum power absorbed: < 10 W
- Current absorbed by the battery: < 0,5 mA
- Operating temperature: from -20 to+ 50°C
- Output short-circuit protection (fuse)
- Inverse polarity protection (fuse)
- Charging curve: programmable
- Visualization by display of the parameters: Voltage, Current, charged Ah and time left to the end of charge
- Accuracy on output voltage: \pm 0,5%
- Thermal compensation of battery voltage (optional with thermal sensor)
- Dynamic compensation of the voltage drop on the output cable
- Acoustic alarm
- Auxiliary contacts of main presence and end of charge (Standard Charger) or of air pump control and end of charge (Charger with air pump)
- Cooling: forced
- Case: Metal base, cover in self-extinguishable ABS
- Size: 545 x 265 x 115 mm
- Weight: 9kg
- Enclosure class: IP20
- **CE** In conformity with the requirements of the Low Voltage Directive and of the Directive EMC.

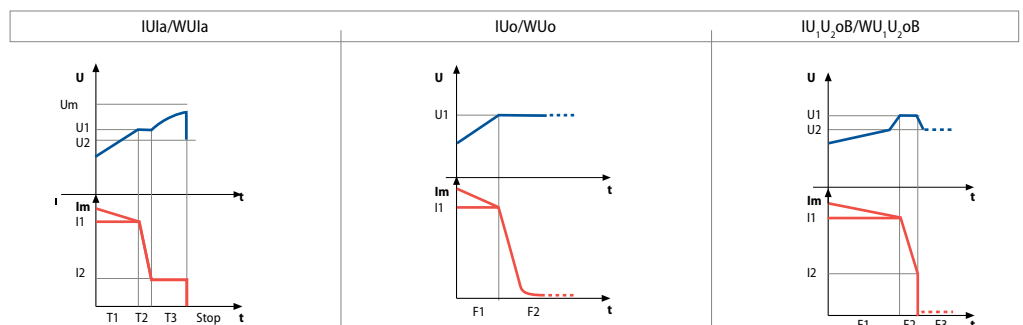


NG5 with Air pump

Every model is available for acid circulation batteries (please, allocate the correct code in the Purchase Order).

INNOVATIVE FEATURES

- LOGIC BOARD WITH "FLASH" MICROPROCESSOR
- STORAGE OF OVER 250 CHARGING CYCLES
- EVEN MORE FLEXIBLE SOFTWARE
- DELAYED START
- MASTER AND SLAVE CONFIGURATION WITH POWER EXCEEDING 70KW
- DESULPHATION CHARGING CURVE
- SUITABLE FOR SEVERAL BATTERY TYPES (LEAD ACID, GEL, LITHIUM-ION, NI-MH, ETC.)



More and different charging curves are available for special batteries and non-standard applications



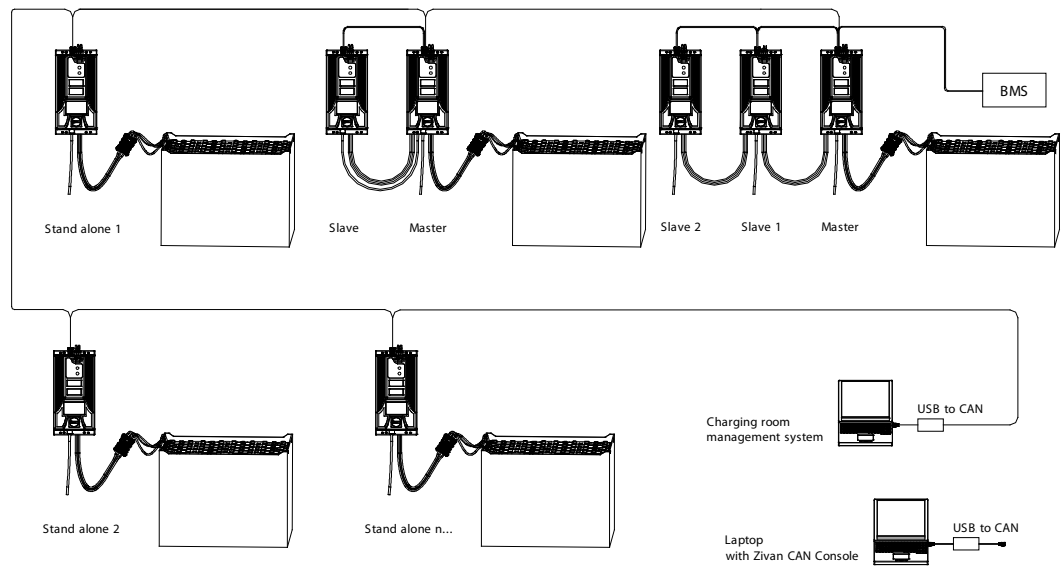
Simplified programming without PC

By pressing the MODE button it can be selected the following:

- Node (MASTER, SLAVE, STAND ALONE)
- Battery type
- Curve type
- Battery capacity in Ah
- Recharging time

Master-Slave connection

Through the inter-connection cable it can be put in parallel up to 9 devices. The Ext connector is used to connect PC, make adjustments and readings. To set the Master, adjust Node 0: then follow step by step the procedure recommended by the system paying attention to select a battery capacity corresponding to C5.



Battery Voltage	Charging time			Model	Type	VAC	I1	Code	IMAX	Mains
	7 - 8,5 h	9 - 11 h	12 - 13 h							
24	480 - 720	800 - 960	1040 - 1120	NG5	24 120	400	100,0	GJBVCB-D70D0Q	120	5
	575 - 865	960 - 1150	1250 - 1345	NG9	24 145	400	120,0	GJBZCB-D70E0Q	144	6
	960 - 1440	1600 - 1920	2080 - 2240	NG9+	24 200	400	120,0	GJBXCB-D70P0Q	200	8
36	480 - 720	800 - 960	1040 - 1120	NG5	36 120	400	100,0	GJCVCB-D70D0Q	120	7
	575 - 865	960 - 1150	1250 - 1345	NG9	36 145	400	120,0	GJCZCB-D70E0Q	144	9
	815 - 1225	1360 - 1630	1770 - 1905	NG9+	36 170	400	170,0	GJCKCB-470E0X	170	12
48	385 - 575	640 - 770	830 - 895	NG5	48 95	400	80,0	GJETCB-D70D0Q	96	8
	480 - 720	800 - 960	1040 - 1120	NG7	48 120	400	100,0	GJEVCB-D70D0Q	120	10
	575 - 865	960 - 1150	1250 - 1345	NG9	48 145	400	120,0	GJEZCB-D70E0Q	144	12
	650 - 970	1080 - 1295	1405 - 1510	NG9+	48 160	400	135,0	GJEWCB-D70P0Q	162	13
72	265 - 395	440 - 530	570 - 615	NG5	72 65	400	55,0	GJHRCB-D70D0Q	66	8
	335 - 505	560 - 670	730 - 785	NG7	72 85	400	70,0	GJHSCB-D70D0Q	84	14
	430 - 650	720 - 865	935 - 1010	NG9	72 110	400	90,0	GJHUCB-D70D0Q	108	13
80	240 - 360	400 - 480	520 - 560	NG5	80 60	400	50,0	GJIQCB-D70D0Q	60	8
	300 - 450	500 - 600	650 - 700	NG7	80 75	400	62,5	GJISCB-D70D0Q	75	10
	385 - 575	640 - 770	830 - 895	NG9	80 100	400	80,0	GJITCB-D70D0Q	96	13
	480 - 640	800 - 960	960 - 1120	NG9+	80 120	400	100,0	GJIVCB-470E0Q	120	10

On the three-phase models 480Vac, the 2nd digit of the part number must be replaced by a "D" (example: GDBVCB-D70D0Q).

The recharging times are purely indicative and refer to batteries discharged at the 80% of their capacities.

Further models are available for other battery voltages.

Chargers

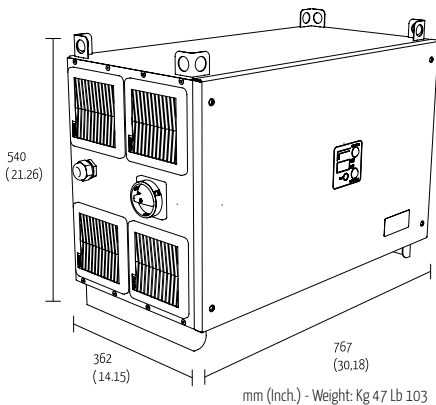
ZIVAN - HIGH-FREQUENCY CHARGERS

BG15 BATTERY CHARGER THREE-PHASE



BG15 THREE PHASE

The charger's heart is a flashable microprocessor equipped with Can Bus interface suitable to several devices connection (PC, BMS, CONTROLLER). Its memory is able to record and store up to 1000 charging cycles insuring a complete analysis on the battery behavior and its use. High power allows fast and opportunity charging to any kind of battery and all adjustments can be done by its programmable display. Through the MODE button you can select the battery chemistry (lead acid, gel, AGM, Li-Ion), choose among multiple charging profiles (IU1A, IU1U20, IU0), battery capacities and reduces times of recharge according to specific application. A desulphation charge and a delayed start is available as well as a stainless steel box to prevent corrosion in open-air application.



TECHNICAL FEATURES

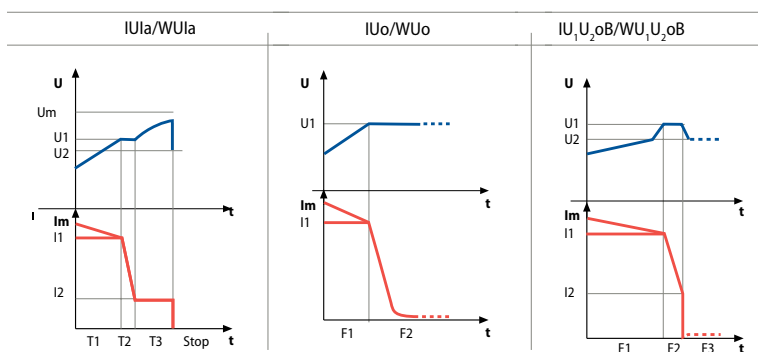
- Input voltage: 400 VAC \pm 15 % Three phase
- Input frequency: 50 – 60 Hz
- Efficiency: > 87%
- Minimum power absorbed: < 20 W
- Current absorbed by the battery: < 1 mA
- Operational temperature: from – 20 to 50°C
- Output short-circuit protection (fuse)
- Inverse polarity protection (fuse)
- Charging curve: programmable
- Accuracy on output voltage: \pm 0,5%

- Thermal compensation of battery voltage (optional with thermal sensor)
- Thermal Alarm
- Cooling: forced
- Case: Metal
- Size: 767 x 540 x 362 mm
- Weight: 47 kg
- Enclosure class: IP20
- **CE** In conformity with the requirements of the Low Voltage Directive and of the Directive EMC.

Battery Voltage	Charging time			Type	VAC	I1	IMAX	Mains
	7-8,5h	9-11h	12-13h					
48	1260-1620	1800-2160	2340-2520	48V 270A	400	270	270	26
80	750-960	1070-1290	1390-1500	80V 160A	400	200	160	32

Every model is available for acid circulation batteries (please, allocate the correct code in the Purchase Order). Further models are available for other battery voltages.

More and different charging curves are available for special batteries and non-standard applications.



More and different charging curves are available for special batteries and non-standard applications



THERMAL SENSOR ADVANTAGES

- The thermal sensor prevents damages to the battery. If an element is faulty, the rest of the battery is safeguarded.
- The charger automatically stops the charge if the temperature of the battery increases above a predetermined value.
- Temperature effect: as you know life of the battery is shortened if it works at higher temperatures. By using the Zivan HF charger battery life is extended.

Please insert the sensor in the middle of the battery, along the free space among cells for a depth of around 20 cm.

Never inside the cells, because acid damages the sensor!



Chargers

ACCESSORIES

UBC & BC1



▶ **BAT/23419**
SCHUKO SUPPORT - Disables the machine when the plug of the charger is removed from its location.



▶ **BAT/28998** 50 cm
▶ **BAT/41869** 100 cm
▶ **BAT/28999** 250 cm
▶ **BAT/29000** 400 cm
KIT LED EXTENSION Ø 10 – Displays the charging phase of the charger (fixing hole Ø 14 mm).



▶ **BAT/29001** 28 cm
LED EXTENSION Ø 5 - fixing hole Ø 6,5 mm.



▶ **BAT/41870** 250 cm
REMOTE INDICATOR Ø 20 - Displays the charging phase of the charger - fixing hole Ø 22 mm.

ALL CHARGERS



▶ **BAT/48423**
CABLE HOLDER FRAME AIR PUMP KIT.


NG1 / NG3 / NG5 / NG7 / NG9



▶ **BAT/476943** m
▶ **BAT/49406** 3 m with micro fit
Remote indicator diameter 20
Displays the charging phase of the charger.



▶ **ZIV/P14011** 2 m
▶ **ZIV/P14014** 5 m
▶ **ZIV/Z-P14025** 2 m with micro fit 12P
Thermal sensor - controls the charging voltage depending on the battery temperature.



▶ **BAT/48422** 2 m
Thermal sensor and led indicator diameter 10.



▶ **BAT/47886** 200 cm
▶ **BAT/47887** 10 m
THERMAL SENSOR AND REMOTE INDICATOR – Ø 20 - fixing hole Ø 22 mm.

NG3



▶ **BAT/42150**
CABLES WAY THROUGH – Allows an appropriate wall installation, thanks to an adequate passage of the cables behind the charger.



▶ **BAT/47888**
ROLL BAR.

NG5 / NG7 / NG9



▶ **BAT/42209**
STAND – A support to place the charger on the ground.



Chargers

ZIVAN - IP54 RANGE

NG9 80/100 IP54 INO
STAINLESS STEEL



NG5 NG7 NG9 METAL GENERATION

TECHNICAL FEATURES

- Dimensions [base plate]: 630 l x 417 w x 210 h
- Cooling: Forced ventilation
- Protection: IP 54
- Case: Inox
- Switching frequency: 20 kHz
- Input voltage: 400 Vac \pm 10 % - 480 Vac \pm 10 %
- Accuracy on output voltage: \pm 0,5 %
- Output short-circuit protection: Electronic
- Inverse Polarity protection: Fuse
- Adjustable curves: Infinite
- Operating Temperature: -20°C to +50°C
- Auxiliary relay: 2
- Can bus communication: up to 2 channel
- Display: Yes
- Memory: Up to 255 cycles

	Current (A)
24V	200
36V	160
48V	70, 100
80V	96, 100, 120



The charger's heart is a **flashable microprocessor** equipped with Can Bus interface suitable to several devices connection (PC, BMS, CONTROLLER).

Its **memory** is able to record and store up to 1000 charging cycles insuring a complete analysis on the battery behavior and its use.

High power allows fast and opportunity charging to any kind of battery and all adjustments can be done by its programmable display.

Through the **MODE button** you can select the battery chemistry (lead acid, gel, AGM, Li-Ion), choose among multiple charging profiles (IU1A, IU1U20, IU0), battery capacities and reduces times of recharge according to specific application.

A **desulphation charge** and a **delayed start** is available as well as a stainless steel box to prevent corrosion in open-air application.

- Flashable microcontroller: for any update and modification
- Large Internal Memory: (250 cycles for monthly reports, extendable to 1000 yearly)
- Optimized Battery life time: Programmable Desulphation and seasonal Thermal compensation
- More than 1000 available algorithms: over 30 years development and test experience in cooperation with Market Leaders
- Flexible Software with variable Set Points: Programmable start of charge cycle adjustable V-A-Time for any curve creation
- Multifunction charger: opportunity, fast, ultra fast charging capability
- Remote Battery and Charger Monitoring: ZIVAN Proprietary DATA DRONE integrated system for customer server based data capture
- LI-ION ready
- CAN BUS Modular architecture: matches with Battery Data Logger
- Adjustable cable voltage drop compensation: dynamic adjustment of the voltage drop depending on current output

▶ **BG9**

for the 9kW model
H 444 x W 211 x D 694



▶ **BG15**

for the 15kW model
H 540 x W 362 x D 767



▶ **BG18**

for the 18kW model
H 540 x W 362 x D 767



	VAC	Type	Ah	Charging time			
				2h	6h	8h	12h
B9	480 or 400	24 200	500 - 1700	400	400 - 800	400 - 1500	1600 - 1700
	480 or 400	36 150	500 - 1500	300	400 - 600	650 - 1100	1100 - 1500
	480 or 400	48 150	500 - 500	300	400 - 600	650 - 1000	1200 - 1500
	480 or 400	80 120	500 - 1400	240	300 - 400	400 - 770	800 - 1400
	480 or 400	96 80	250 - 800	150	100 - 250	250 - 550	600 - 800
BG15	400	48V 270A	900 - 2520	-	900	1620	2340
	400	80V 160A	536 - 1500	-	536	964	1393
BG18	480 or 400	24 400	500 - 1700	400 - 700	750 - 1400	1450 - 1700	-
	480 or 400	36 300	500 - 1500	400 - 600	700 - 1200	1250 - 1500	-
	480 or 400	48 300	500 - 1500	400 - 600	700 - 1200	1250 - 1500	-
	480 or 400	80 240	500 - 1700	400	400 - 800	400 - 1500	1600 - 1700
	480 or 400	96 160	500 - 1500	300	400 - 560	600 - 1100	1200 - 1500

For battery technologies: Lead Acid, AGM, GeL, LI-ION

Chargers

ZIVAN - ULTRA FAST CHARGERS - HF



► **MG18 - Box type "2"**

for the 18kW model
H 825 x W 472 x D 402



► **MG27 - Box type "3"**

for the 27kW model
H 255 x W 173 x D 306



► **MG36 - Box type "4"**

for the 36kW model
H 255 x W 173 x D 306

A turnkey system made by a battery data logger and the zivan data drone app enables an overview over forklift, battery and recharge as well as on maintenance and operating costs in real time

EFFICIENCY AND SAFETY

IP20 protection degree. The battery is everyday charged up to 80% to avoid gas emissions. The charger is equipped with a 55° safety cutoff and seasonal dynamic compensation of gas value depending on ambient temperature. It is provided with a every day / once a week / never / on demand adjustable equalization charge in order to prevent possible battery degradation (cells unbalancing, plates sulfatisation). the equalization profile consists of an IUIA 17A/100 charge followed by a proper balancing phase. the equalization profile guarantees a 100% battery S.O.C. the system is able to reboot a huge battery capacity range from 500 up to 1500Ah

CONSIDERABLE SAVING

The scope of the ultra fast range is to avoid recharging battery room installations, to reduce battery replacements enabling the truck to work for up to 3 shifts per day nonstop by adding as much as possible Ah by intermediate or opportunity charging cycles during breaks. We recommend using onefast-charger for each lift truck and applying the necessary adjusting specific for that particular battery. The system modulates the charging cycle depending on the battery depth of discharge (dod) and the battery temperature by real time communication with battery data logger.

The multi-module charger box includes several can bus units in a master/slave configuration network up to 36KW power.

The data drone software provides report charts which are wifi-stored in a protected and customised cloud.

- Flashable microcontroller: for any update and modification
- Large Internal Memory: (250 cycles for monthly reports, extendable to 1000 yearly)
- Optimized Battery life time: Programmable Desulphation and seasonal Thermal compensation
- More than 1000 available algorithms: over 30 years development and test experience in cooperation with Market Leaders
- Flexible Software with variable Set Points: Programmable start of charge cycle adjustable V-A-Time for any curve creation
- Multifunction charger: opportunity, fast, ultra fast charging capability
- Remote Battery and Charger Monitoring: ZIVAN Proprietary DATA DRONE integrated system for customer server based data capture
- LI-ION ready
- CAN BUS Modular architecture: matches with Battery Data Logger
- Adjustable cable voltage drop compensation: dynamic adjustment of the voltage drop depending on current output

	VAC	Type	Ah	Charging time			
				2 h	6 h	8 h	12h
MG18	400	24 340	500 - 1700	450 - 700	750 - 1400	1450 - 1700	-
	400	36 300	500 - 1500	400 - 600	700 - 1200	1250 - 1500	-
	400	48 300	500 - 1500	400 - 600	700 - 1200	1250 - 1500	-
	400	80 240	500 - 1700	400	400 - 800	400 - 1500	1600 - 1700
	400	96 160	500 - 1500	300	400 - 560	600 - 1100	1200 - 1500
MG27	400 or 480	36/48 480	500 - 1700	500 - 900	500 - 1700	500 - 1700	-
	400 or 480	72/80 360	500 - 1700	500 - 700	500 - 1700	500 - 1700	-
	400 or 480	96 270	500 - 1500	500	500 - 840	500 - 1500	-

For battery technologies: Lead Acid, AGM, Gel, LI-ION

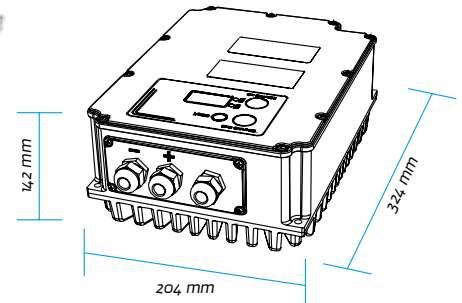
Chargers

ZIVAN - IP66 RANGE

SG3 SEALED BATTERY CHARGER SINGLE-PHASE

SG3 SINGLE FASE

The SG3 marks a new revolution of integrating an on-board charger to an electric vehicle platform. The active PFC filter is perfectly suited for applications around the world, accepting a supply voltage from 95 to 265 VAC. The innovative configuration of its heat sink, integrated into the rugged die-cast aluminium IP65 enclosure of the charger, allows for maximum flexibility of installation and extreme working conditions. The SG3 utilizes the latest generation flash microcontroller, which is necessary to handle the multitude of possible charging algorithms installed. The isolated CANBUS interface (2.0) enables integration of the unit into the system architecture of the vehicle. The abundant storage capacity is able to save up to 1K charging cycles, allowing for a complete analysis of the behaviour of the battery and use over its lifetime. Last but not least, the SG3 is optimized to allow for high efficiency conversion from standard household sockets, allowing for the charging of all kinds of battery technologies.



TECHNICAL FEATURES

- Universal Input Voltage: 95-265 VAC
- Input frequency: 50-60 Hz
- Power factor: 0,98
- Efficiency: up to 93%
- Absorbed standby power: < 3W
- Absorbed current from the battery: < 0,5 mA
- Output voltage accuracy: $\pm 0,5 \%$
- Operating case temperature: -30° to $+70^{\circ}\text{C}$
- Galvanic Insulated CAN-BUS Interface
- Output short-circuit protection
- Inverse polarity protection (fuse)
- Programmable charging curve
- Optional: visualization by display of the parameters: Voltage, Current, charged Ah and Time
- Thermal compensation of battery voltage (optional with external thermal sensor)
- Programmable auxiliary contacts: main presence, charge in progress, air pump function
- Clock Calendar
- Data Logging
- Delayed start
- Able to be paralleled
- Vibration-proof structure
- Die cast aluminium box
- Size: 324x204x142 mm
- Weight: 8 kg.
- Enclosure class: IP65
- External Fan class: IP55
- **CE** In conformity with the requirements of the Low Voltage Directive and of the Directive EMC

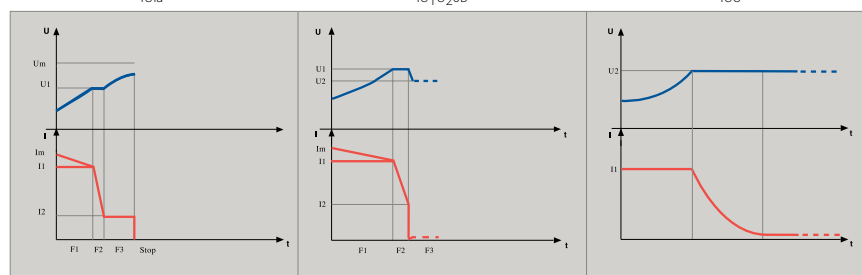


Battery Voltage	VAC	Charging time			Type	I1 230VAC	I1 120VAC	Mains
		7-8,5h	9-11h	12-13h				
24	230	320 - 575	640 - 770	830 - 895	24V 80	80	40	11
	120	160 - 290	320 - 385	415 - 450				
36	230	240 - 430	480 - 576	624 - 672	36V 60	60	30	13
	120	120 - 215	240 - 285	310 - 330				
48	230	200 - 360	400 - 480	520 - 560	48V 50	50	25	14
	120	100 - 180	200 - 240	260 - 280				
72	230	140 - 252	280 - 330	360 - 390	72V 35	35	18	15
	120	70 - 125	140 - 175	180 - 195				
80	230	120 - 215	240 - 290	310 - 335	80V 30	30	15	14
	120	60 - 105	120 - 145	155 - 175				
84	230	120 - 215	240 - 290	310 - 335	84V 30	30	15	15
	120	60 - 105	120 - 145	155 - 175				
96	230	100 - 180	200 - 240	260 - 300	96V 25	25	13	14
	120	50 - 90	100 - 120	130 - 105				

IUIa

IU₁ U₂ 0B

IUo



Product range under expansion. For further models please contact us.

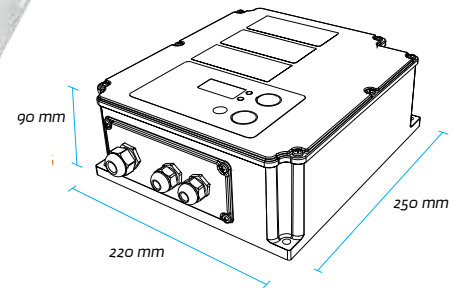
The recharging times are purely indicative and refer to batteries discharged at the 80% of their capacities.

Charging curves specimen

Chargers

ZIVAN - IP66 RANGE

SG6 SEALED BATTERY CHARGER SINGLE-PHASE

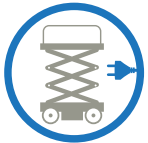
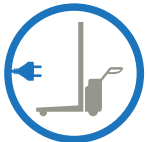


SG6 SINGLE FASE

The single-phase SG6 represents the innovation in Zivan's product range. It is a rugged high frequency battery charger sealed to IP65 housed in a strong die cast aluminium enclosure. Thanks to its IMS technology, its small size and a vibration-proof structure, it can be easily installed as an on-board charger. The powerful flash microcontroller, with integrated CAN-BUS interface, enables it to communicate with other devices such as the controller, BMS, PC, display, etc.; allowing integration into the most advanced systems. The SG6 properly applies the correct charge curve for all different battery types (GEL, Li-ion, LiPo, NiMh, Pb etc.). The new SG6 has the possibility to save up to 1000 charging cycles, with several fields for every record, to monitor the behaviour of the battery. Through the CLOCK CALENDAR option it is possible to date all events for history analysis.

TECHNICAL FEATURES

- Input Voltage: 230 VAC \pm 10%
115 VAC \pm 10%
- Input frequency: 50-60 Hz
- Efficiency: up to 93%
- Absorbed minimum power: < 5W
- Absorbed current from the battery: < 0,5 mA
- Operating temperature (case): from -30° to +70°C
- Charging curve: programmable
- Optional: visualization by display of the parameters: Voltage, Current, charged Ah and time left to the end of charge
- Accuracy on output voltage: \pm 0,5 %
- Thermal compensation of battery voltage (optional with external thermal sensor)
- Programmable auxiliary contacts: main presence (default), battery charger state, fan management
- Die cast aluminium box
- Clock Calendar
- Insulated Can Interface
- Data Logging
- Delayed start
- Able to parallel up to 9 units
- Cover in self-extinguishable Nylon 6/6
- Vibration-proof structure
- Size: 250x220x90 mm
- Weight: 5 kg.
- Enclosure class: IP65
- **CE** In conformity with the requirements of the Low Voltage Directive and of the Directive EMC

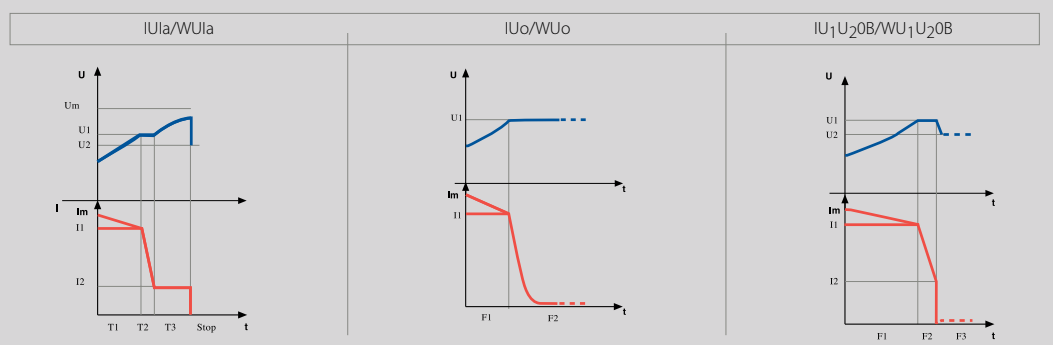


Battery Voltage	VAC	Charging time			Type	I1	IMAX	Code	Mains
		7-8,5 h	9-11 h	12-13 h					
12	230	240 - 360	400 - 480	520 - 560	12 60	50	60	G6ARQ9-12000Q	7
24	230	240 - 360	400 - 480	520 - 560	24 50	50	50	G6BQ9-12000Q	11
36	230	215 - 325	360 - 430	470 - 505	36 55	45	55	G6CP9-12000Q	14
48	230	170 - 250	280 - 335	365 - 390	48 45	35	42	G6EN9-12000Q	15
72	230	105 - 160	175 - 210	230 - 245	72 26	22	26	G6HI9-12000Q	14
80	230	95 - 145	160 - 190	210 - 225	80 24	20	24	G6IH9-12000Q	14
84	230	85 - 130	145 - 175	185 - 200	84 24	20	24	G6LH9-12000Q	15
96	230	85 - 130	145 - 175	185 - 200	96 21	18	21	G6MH9-12000Q	15

Further models are available for other battery voltages.

The recharging times are purely indicative and refer to batteries discharged at the 80% of their capacities.

Charging curves specimen



BATTERY DATA LOGGER

12-80V - WI-FI



INCLUDED

- Current sensor
- Electrolyte level sensor
- Thermal sensor

Optional:

- The datalogger can be programmed by PC with following tools:
 - CAN To USB Converter (ZIV/Z-C13105)
 - CAN Cable (BAT/49317)
- The datalogger can be programmed by WIFI:
 - Internet connection of your PC by hardware cable or UMTS
 - Datalogger connection by WIFI

▶ BAT/49294

THANKS TO THE ZIVAN DATALOGGER THE BATTERY CAN COMMUNICATE WITH THE CHARGER = PERFECTLY CHARGED BATTERY UPON DISCHARGE OF THE BATTERY

▶ BAT/49206 (Universal WiFi datalogger)

The data logger is connected to an industrial vehicle battery. It monitors the main battery parameters, recording all essential values then ensuring its utmost care and efficiency. By external sensors (bidirectional current sensor, thermic sensor, liquid level sensor) all battery data can be read, recorded and broadcasted along working and charging cycle of the machine. Collected data allows detecting battery status as well as introducing appropriate corrections to charging process insuring an extended battery lifetime. By battery CAN Bus charger it is possible to modify real-time the charge algorithm.

MORE INFO: SEE PAGE 106



HIGH FREQUENCY BATTERY CHARGERS



TAKE ME SYSTEM MASTER UNIT

OVERVIEW

The Take Me System is a simple yet very effective way to properly manage a charging room, made of up to 20 Zivan CanBus battery chargers. The Master Unit infact will track the charging process of all the chargers it is connected to, in order to determine which charge has ended first and communicate it to the user who needs to pick up a battery in the charging room. In this way you will make sure that all your battery fleet is regularly cycled, instead of having just a few over-cycled batteries.

To inform the user which battery is ready for being picked up, the Master Unit forces on the green BIG LED in the related charger. All the chargers, when set to work for the Take Me System, will have the red BIG LED on. As soon as the battery is picked up, the Master Unit will light on the green BIG LED of the charger who finished the charge second, and so on.

BASIC PRINCIPLES

The Master Unit tracks the charging process of all the battery chargers connected to the CanBus; as soon as a charger finishes the charging process (that is, completing equalization), the Master Unit will save that node in a First-In First-Out (FIFO) queue. The first charger in the queue will have its green BIG LED turned on; all the other chargers will have the red BIG LED on. This is true as long as each charger have the Take Me option enabled and the communication from the Master Unit is correctly working. If one of these conditions is not met, the charger will light up the BIG LED accordingly to its original specification.

By drawing the correct battery, the drawing queue will be shifted down. Any charger that completes a charge will be placed on top of the queue.

By drawing a battery which is not the one indicated by the Master Unit, the system will enter an alarm state (wrong battery drawing). This means that, for 60 seconds, the buzzer of both the charger and the Master Unit will beep. Additionally, the Master Unit enables the Auxiliary Output.

The Take Me System has been designed in order to be user-fault-tolerant. For this reason, if the wrongly taken battery is reconnected within the 60 seconds limit, the alarm condition is cleared: the charger will resume the charge from the point it was interrupted and the Master Unit will insert the charger node in the position it was occupying before the alarm, like shown in the image below. In this case, the system completely recovers from the fault, just like it never happened.

AUTOMATIC WATERVALVE



▶ BAT/48449

Automatic Watervale (220V)
Works on every charger.
The valve is connected by the charger which gives the "end of charge" signal and opens the valve for an xx adjustable time.



▶ BAT/48450

For Zivan CANBUS version > 1.06

Chargers

AQ-TRON® STANDARD CHARGERS 12 HOURS - WA



AQ-TRON®

TECHNICAL SPECIFICATIONS Wa

- Mains input 230/400Vac $\pm 5\%$ 50-60Hz
- Characteristics of charge current Wa
- Microprocessor controlled charging process
- Clear and recognisable visualisation of charging level through 5mm LEDs and display
- Display and acoustic Safety timer over the 12h
- Last 5 charge cycles saved on board memory
- Starting charge automatic or manual
- Suitable for rated battery voltages from 12V - 24V - 36V - 48V - 80V
- Maintenance charge
- Phase failure signalling
- Intelligent post-charge
- Conformity to European normative **CE** marking

RECOMMENDATIONS

Before buying a charger, next data must be determined:

a) CHARGE CYCLE

We advise you to consider your choice of the battery, and to examine all our chargers. Every model was designed for a specific application. Before you choose, check the next points:

- 1) Is the battery totally or partly discharged when it's connected to the charger?
- 2) How much time is there to charge the battery?
- 3) Do you need a charger which can charge batteries with different tension and capacity? Contact us!

AQ-TRON® PRACTICAL 12 HOUR CHARGER TO KEEP YOUR BATTERIES IN TOP CONDITION

	Ref.	Tension (V)	Power supply (V)	Current (A)	Dim. XxYxH	Average C5 (Ah)	
12 V	AQ12M15	12	230	15	250 x 160 x 180	75	
	AQ12M20	12	230	20	250 x 160 x 180	110	
	AQ12M25	12	230	25	250 x 160 x 180	140	
	AQ12M30	12	230	30	340 x 260 x 260	170	
24 V	AQ24M10	24	230	10	250 x 160 x 180	55	
	AQ24M15	24	230	15	250 x 160 x 180	75	
	AQ24M20	24	230	20	250 x 160 x 180	110	
	AQ24M25	24	230	25	340 x 260 x 260	140	
	AQ24M30	24	230	30	340 x 260 x 260	170	
	AQ24M40	24	230	40	340 x 260 x 260	220	
	AQ24M50	24	230	50	340 x 260 x 260	290	
	AQ24M60	24	230	60	340 x 260 x 260	360	
	AQ24M80	24	230	80	340 x 260 x 260	460	
	AQ24T80	24	3x400	80	500 x 350 x 400	460	
	AQ24M100	24	230	100	500 x 350 x 400	600	
	AQ24T100	24	3x400	100	500 x 350 x 400	600	
	AQ24T120	24	3x400	120	500 x 350 x 400	750	
	AQ24T140	24	3x400	140	500 x 350 x 400	875	
36 V	AQ36M20	36	230	20	340 x 260 x 260	110	
	AQ36M25	36	230	25	340 x 260 x 260	140	
	AQ36M30	36	230	30	340 x 260 x 260	170	
	AQ36M40	36	230	40	340 x 260 x 260	220	
	AQ36M50	36	230	50	340 x 260 x 260	290	
	AQ36M60	36	230	60	500 x 350 x 400	360	
	AQ36M80	36	230	80	500 x 350 x 400	460	
	AQ36T80	36	3x400	80	500 x 350 x 400	460	
	AQ36T100	36	3x400	100	500 x 350 x 400	600	
	AQ36T120	36	3x400	120	500 x 360 x 900	750	
AQ36T140	36	3x400	140	500 x 360 x 900	875		
48 V	AQ48M50	48	230	50	500 x 350 x 400	290	
	AQ48T50	48	3x400	50	500 x 350 x 400	290	
	AQ48M60	48	230	60	500 x 350 x 400	360	
	AQ48T60	48	3x400	60	500 x 350 x 400	360	
	AQ48M80	48	230	80	500 x 350 x 400	460	
	AQ48T80	48	3x400	80	500 x 350 x 400	460	
	AQ48M100	48	230	100	500 x 360 x 900	600	
	AQ48T100	48	3x400	100	500 x 360 x 900	600	
	AQ48T120	48	3x400	120	500 x 360 x 900	750	
	AQ48T160	48	3x400	160	500 x 360 x 900	1000	
72 V	AQ72T80	72	3x400	80	500 x 360 x 900	460	
	AQ72T100	72	3x400	100	500 x 360 x 900	600	
	AQ72T120	72	3x400	120	500 x 360 x 900	750	
80 V	AQ80T80	80	3x400	80	500 x 360 x 900	460	
	AQ80T100	80	3x400	100	500 x 360 x 900	600	
	AQ80T120	80	3x400	120	500 x 360 x 900	750	
	AQ80T140	80	3x400	140	500 x 360 x 900	875	
	BAT/19591	UNIVERSAL TRANSFORMATION KIT 12V-96V					



M = monofase / monophasé / mono-phase

T = driefase / triphasé / three-phase

Chargers

AQ-TRON® EQUIPMENT

AQ-TRON®

▶ BAT/34544	Electronic card for single phase charger
▶ BAT/34543	Electronic card for three-phase charger
▶ BAT/34545	Rectifier bridge for single phase charger 20 A
▶ BAT/21090	Rectifier bridge for single phase charger 30 A
▶ BAT/15417	Rectifier bridge for single phase charger 40 A
▶ BAT/34548	Rectifier bridge for single phase charger 50 A
▶ BAT/33100	Rectifier bridge for single phase charger 60 A
▶ BAT/34550	Rectifier bridge for three-phase charger 60 A
▶ BAT/34551	Rectifier bridge for three-phase charger 80 A
▶ BAT/34552	Rectifier bridge for three-phase charger 100 A
▶ BAT/34553	Rectifier bridge for three-phase charger 120 A
▶ BAT/34554	Rectifier bridge for three-phase charger 140 A
▶ BAT/34555	Single phase fuses 20/30/40/60/80A
▶ BAT/34556	Three-phase fuses 80/100/120/140/160A

CHECKLIST

- 1 ✓ Compact size
- 2 ✓ Solid body
- 3 ✓ Simple use
- 4 ✓ Clear indication of the charge phase
- 5 ✓ Equalization charge
- 6 ✓ Safety timer
- 7 ✓ CE-label
- 8 ✓ Exact calibration of the mains voltage
- 9 ✓ Connection cables included



▶ BAT/33368

Protecting cage for chargers
Size: 520 x 380 x 920 (h)



▶ BAT/33369

Protecting cage for chargers
Size: 520 x 380 x 460 (h)



Chargers

FUSES FOR BATTERY CHARGERS

► DIN 72581 CERAMIC

Center distance: 30



Ref.	Amp.
BAT/18200	30
BAT/18202	50
BAT/18204	80
BAT/18206	100
BAT/18208	150

► DIN 72582 CERAMIC

Center distance: 30



Ref.	Amp.
BAT/17120	30
BAT/17121	50
BAT/17122	80
BAT/17126	100
BAT/18214	150

► DIN 43561 CERAMIC

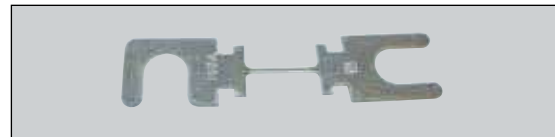
Center distance: 60



Ref.	Amp.
BAT/17661	35
BAT/18218	40
BAT/17662	50
BAT/18220	63
BAT/18222	80
BAT/17663	100
BAT/18224	125
BAT/18226	135
BAT/18228	150
BAT/18230	160
BAT/18232	175
BAT/18234	200
BAT/18236	225
BAT/17565	250
BAT/17569	275
BAT/17566	300
BAT/18238	325
BAT/17567	355
BAT/17412	400
BAT/18240	425
BAT/18242	500

► DIN 43560 CERAMIC

Center distance: 60



Ref.	Amp.
BAT/16669	35
BAT/16670	40
BAT/16671	50
BAT/16672	63
BAT/16673	80
BAT/16674	100
BAT/17129	125
BAT/17132	135
BAT/17135	150
BAT/17137	160
BAT/17139	175
BAT/17141	200
BAT/18247	225
BAT/18249	250
BAT/18251	275
BAT/18253	300
BAT/18255	325
BAT/18257	355
BAT/18259	400
BAT/18261	425
BAT/18263	500

► TYPE LET 240V

Center distance: 42



Ref.	Amp.
BAT/18426	25
BAT/18430	35
BAT/18432	50
BAT/18434	63
BAT/18436	80
BAT/18438	100
BAT/18440	125
BAT/18442	160
BAT/18444	180

Chargers

AQ-TRON® INDUSTRIAL CHARGERS

RECOMMENDATIONS

Before buying a charger, next data must be determined:

a) CHARGE CYCLE

We advise you to consider your choice of the battery, and to examine all our chargers. Every model was designed for a specific application. Before you choose, check the next points:

- 1) Is the battery totally or partly discharged when it's connected to the charger?
- 2) How much time is there to charge the battery?
- 3) Do you need a charger which can charge batteries with different tension and capacity? Contact us!

b) TENSION OF THE CHARGER

The tension of the charger must be the same as that of the battery: 2.0V per cell.

c) CHARGE CURRENT

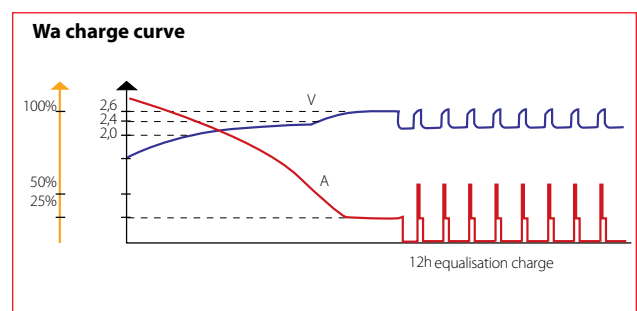
The charge current must be chosen in accordance with the battery capacity. With charge current, we mean the current which is given by the charger when the battery is at its nominal voltage (2.0V/cell). The current decreases to 50% when the battery tension rises up to 2,4V/cell and to 25% when 2.65V/cell is reached. For example: 48V - 100A / 57,6V - 50A / 63.6V - 25A.



Wa charge curve

Wa charge curve:

Consists in a principal charge phase and a final charge phase. The charger starts to charge with a maximal current (100 %), during the charge, the battery tension increases and the charge current decreases correspondingly. When 2.4V/cell is reached, the charge current is decreased to 50 % and the principal charge phase is ended. During the final charge phase, the charge current decreases to 25 %, and a battery tension of 2.65V/cell is reached (= full battery tension).



CAPACITY TABLE FOR AQ-TRON® BATTERY CHARGERS

BATTERY DATA		POWER REQUIRED	MAXIMUM CURRENT AND FUSES					
VOLT V	AMP A		MAIN POWER KVA	SINGLE -PHASE		THREE PHASE		
		VOLT 230		FUSE aM	VOLT 230	FUSE aM	VOLT 400	FUSE aM
24	25	0.90	3.9	6,3				
24	30	1.08	4.7	6,3				
24	40	1.44	6.3	8,0	3.6	6	2.1	4
24	60	2.16	9.4	12,0	5.4	8	3.1	4
24	80	2.88	12.5	16,0	7.2	12	4.2	6
24	100	3.60	15.7	20,0	9,0	16	5.2	8
24	120	4.32			10.9	20	6.2	10
24	140	5.04			12.7	20	7.3	12
36	30	1.62	7,0	12,0	4.1	6	2.3	4
36	40	2.16	9.4	16,0	5.4	8	3.1	4
36	60	3.24	14.1	20,0	8.1	12	4.7	8
36	80	4.32	18.8	32,0	10.9	16	6.2	10
36	100	5.40	23.5	40,0	13.6	20	7.8	12
36	120	6.48	28.2	50,0	16.3	25	9.4	12
36	140	7.56			19,0	32	10.9	16
48	40	2.88	12.5	20,0	7.2	12	4.2	6
48	60	4.32	18.8	32,0	10.9	16	6.2	10
48	80	5.76	25,0	40,0	14.5	25	8.3	12
48	100	7.20			18.1	32	10.4	16
48	120	8.64			21.7	35	12.5	20
48	140	10.08			25.3	40	14.6	25
48	160	11.52					16.6	25
72	60	6.48			16.3	25	9.4	16
72	80	8.64			21.7	35	12.5	20
72	100	10.80			27.1	40	15.6	25
72	120	12.96					18.7	32
72	140	15.12					21.8	40
72	160	17.26					25,0	40
80	60	7.20			18.1	32	10.4	16
80	80	9.60			24.1	40	13.9	25
80	100	12.00			30.2	50	17.3	25
80	120	14.40					20.8	32
80	140	16.80					24.3	40
80	160	19.20					27.7	50
80	180	21.60					31.2	50
96	60	8.64			21.7	35	12.5	20
96	80	11.52			29,0	50	16.6	25
96	100	14.40					20.8	40
96	120	17.28					25,0	40
96	140	20.16					29.1	50
96	160	23.04					33.3	50
96	180	25.92					37.5	63

Battery regeneration

SERVICE CHARGERS

▶ BAT/47835 - SERVICE CHARGER



- ➔ Adjustable charger and power supply
- ➔ For all types of batteries
- ➔ Microcomputer controlled
- ➔ Desulphates sulphated batteries

Technical specification	BAT/48163
Mains supply:	50–255 V, (50–200 power limited), 45–65 Hz
Current draw:	max 4,5 A
Power factor:	~1 (PFC)
Max. current:	10 A
Max. voltage:	120 V
Max. power:	800 W
Max. ripple out:	30 mV RMS
Efficiency:	> 86%
Frequency:	> 100 kHz
Cooling:	Temperature-controlled fan
Weight:	1,6 kg
Dimension:	258 x 136 x 89 mm
Protection:	IP20, (Electrically II, with or without earth)
Cables:	One set of laboratory cables is included

Service chargers 12V/50A, 36V/30A, 54V/20A and 72V/15A are also available.

Characteristics

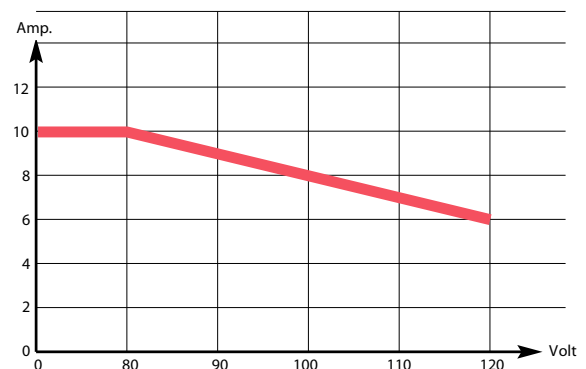
At least 200 V main supply is needed for full power of 800 W.

Areas of use

SMP can be used in a battery workshop to desulphate batteries that has been deeply discharged or not charged for a long time. Thanks to the low weight (1.6 kg) and small dimensions it is also very useful in service workshops and for service technicians who work with batteries, chargers and forklift trucks.

TECHNICAL FEATURES

- Power supply from 0–120 V and 10 A
- Can save batteries that have been discharged for a long time
- Freely adjustable voltage limit
- Freely adjustable current limit
- Can simulate a battery when fault finding on a charger
- Assist to start charger when battery is deeply discharged
- Voltage and current levels to be read from separate clear displays



Battery regeneration

MULTIVOLTAGE BATTERY CHARGER

CONSTANT CURRENT GENERATOR CAN BUS

MULTI VOLTAGE CHARGER

CONSTANT CURRENT GENERATOR

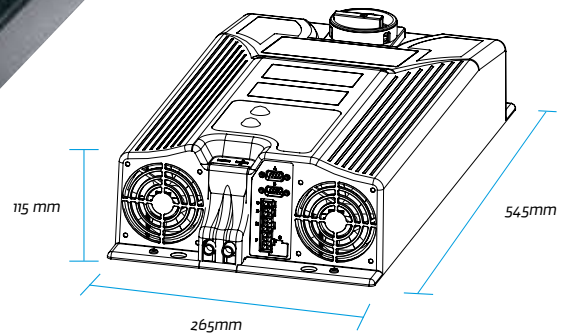
The New Current Generator with CAN BUS is a fully digital device with a double function: constant Current Generator and Battery Charger, with CAN BUS interface. Versatility, efficiency, and on the spot service remain its fundamental points of strength, combined together with the innovative features of CAN BUS chargers: "flash" microprocessor endowing enabling high calculation power and huge storage capacity, regulation of all charging features by a single button, and the possibility to view in historical data concerning previous charge cycles.

AS CURRENT GENERATOR:

Allows recovery of sulphated or total discharged batteries. Using MODE button, a constant current charge can be sustained for a long duration, achieving de-sulphation of batteries.

AS BATTERY CHARGER:

Allows the recharge of batteries from 2 to 96V nominal, with adjustable current from 0 to 50 A, and selectable time from 1 to 100 hours.



TECHNICAL FEATURES

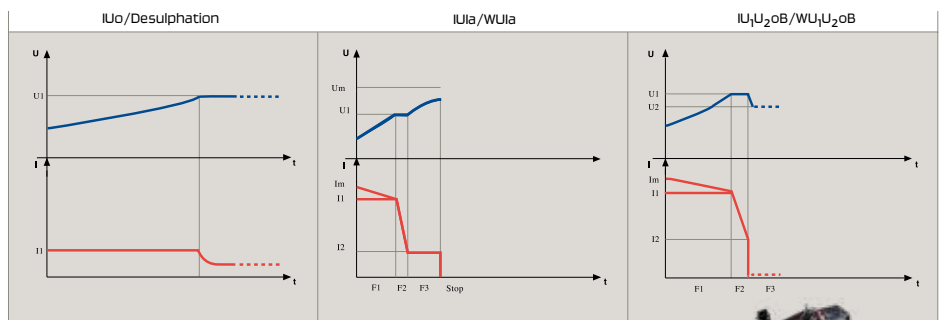
THREE-PHASE CURRENT GENERATOR Mod. NG7 CAN BUS

- Input voltage: 400 VAC \pm 15 % Three phase
- Input frequency: 50 - 60 Hz
- Minimum power absorbed: < 10 W
- Current absorbed from the battery: < 0,5 mA
- Operating temperature: from -20 to + 50°C
- Output short-circuit protection
- Inverse polarity protection (fuse)
- Programmable operating mode: Battery Charger/ Current Generator
- Visualization by display of the parameters: Voltage, Current, charged Ah, Time left to the end of charge (Charger mode) or Time spent (Current Generator mode)
- Charging curve: programmable (Charger mode)
- Dynamic compensation of the voltage drop on the output cable (Charger mode)
- Auxiliary contacts for beginning and end of charge
- Accuracy on output voltage: \pm 0,5%
- Acoustic and visual alarm
- Cooling: forced
- Case: Metal base, cover in self-extinguishable ABS
- Size: 545 x 265 x 115 mm
- Weight: 9 Kg.
- Enclosure class: IP20
- **CE** In conformity with the requirements of the Low Voltage Directive and of the Directive EMC.

BAT/17254

Battery Voltage	VAC	Charging time			Type	I1	IMAX	Code	Mains
		10 h	11 - 12 h	13 - 18 h					
2 V -> 96 V	400	50 - 400	450 - 520	560 - 950	2-96 50	50	60	G9MRCG-D70D0X	1 A -> 15 A

Charging curves specimen



Programming without PC

By pressing the MODE button the user can select between Charger and Current Generator mode. On the digital panel the following parameters can be displayed:

Charging mode:

- Battery type
- Battery voltage
- Curve type
- Battery capacity in Ah

Current generator mode:

- Battery voltage
- Current
- Desulphation/charging time

ACCESSORIES

BAT/42209

A support to place the Charger on the ground.



Battery regeneration

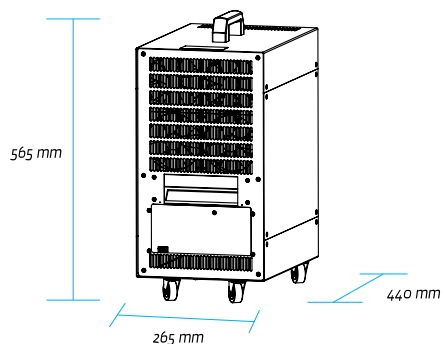
BATTERY DISCHARGERS

AT CONSTANT CURRENT



BATTERY DISCHARGER

The battery discharger, with constant current, is a portable device that can determine the efficiency of a battery, new or used, it can measure the Ah supplied by the battery before reaching the level at which it is considered discharged (typically 1,7V/Cell).



BAT/14934 FSIA11

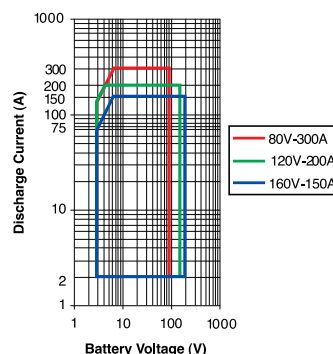
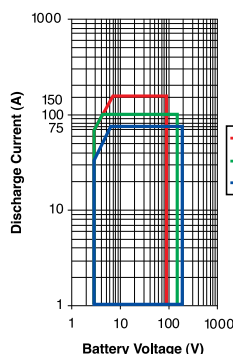
Code	Type	Nominal voltage	Maximum voltage	Adjustable discharging current	Case
FSIA11	80V 150A max	80V	96V	1 - 150A	A
FSPD11	120V 100A max	120V	160V	1 - 100A	A
FSSA11	160V 75A max	160V	192V	1 - 75A	A
FSPD15	220V 50A - 120V 100A max	220-120V	264-160V	1 - 50A - 1 - 100A	A
FSIC11	80V 300A max	80V	96V	2 - 300A	A+B
FSPE15	120V 200A max	120V	160V	2 - 200A	A+B
FSSB15	160V 150A max	160V	192V	2 - 150A	A+B

These models are available with optional isolated port **RS232**, the last two characters of the code are replaced with the characters "15" (ex: **FSIA11** becomes **FSIA15**), except on model 120V 100A becoming **FSPD17**.

TECHNICAL FEATURES

- Input Voltage: 230 VAC
- Input frequency: 50 - 60 Hz
- Absorbed power: 150W
- Tolerance of reading value: $\pm 15\%$
- Thermal protection
- Inverse polarity protection
- Over voltage protection
- Serial port RS232 (not isolated)
- Size: 565 x 265 x 440 mm
- Weight: 26 kg

DISCHARGING FEATURES



Battery regeneration

BATTERY REGENERATORS

THE MOST PROFESSIONAL
PIECE OF BATTERY
MAINTENANCE EQUIPMENT
FOR YOUR WORKSHOP!



80% of the batteries breaking down and losing capacity are sulphated, but can be restored with the correct equipment. Want to extend the lifespan of your batteries? The electrical high-frequency pulsation process of our battery regenerators will restore them quickly and easily. You get the ability to reuse old and sulphated batteries in no time. It's also ideal to use for annual maintenance. From starter to stationary and even Ni-Cad batteries: our versatile regenerator is ready to patch them up.

WHAT IS SULPHATION?

When using batteries small sulphate crystals form. But no panic: these are normal and not harmful at all. But during prolonged charge deprivation, the amorphous lead sulphate converts to a crystalline form that deposits on the negative plates. This leads to the development of larger crystals. These reduce the battery's active material that is responsible for high capacity and low resistance.

Sulphation build-up can simply not be avoided. It's a process that accelerates over time. Why? There are several reasons:

- The battery was inactive for too long.
- The battery was discharged too deeply.
- The wrong charger was used.
- A bad cell was left untreated.
- The battery has reached too high/low temperatures.
- The charge cycles weren't observed.

LUCKILY FOR YOU, OUR REGENERATOR IS READY TO HELP:

- Save money
- Offer professional battery maintenance services to your clients
- Applicable to following industries: forklift, MEWP, ground support golfcarts, cleaning, telecom, UPS and solar power
- Combination of battery discharger and charger, 2-in-1
- Detailed test reports
- Extended lifespan of batteries
- Quick regenerations
- Free analysing software
- Wireless connection between regenerator and computer
- Possibility to monitor the regenerator process via smartphone or laptop.
- 18-month warranty
- CE certified, MET-certified (US market)

For more information on the Energic Plus battery regenerator range, visit the Energic Plus website: www.energicplus.com

Chargers

EV CHARGING STATIONS



CHARGING STATION TO CHARGE AT YOUR HOME OR COMPANY

A charging station can be easily installed at your home. All you have to do is plug in the cable and you can start charging at a higher speed than with a Portable charger. An EV charging station guarantees faster charging of your electric car.

You can choose between different capacities of charging stations 7, 11 & 22KW and you have the choice between different charging plugs type 1 & 2.

The EV charging stations are equipped with a socket. This allows you to charge different types of electric vehicles with 1 car charging station. This requires a compatible charging cable.



- IP67 and wall mount / stand installation provides high adaptability
- CE UL TUV certificate



Standard provided for wall mounting.

◀ **BAT/49503 - Mounting post**

Optional

◀ **BAT/49660 - Plug holder**

for plug type 1

◀ **BAT/49661 - Plug holder**

for plug type 2

Reference	BAT/49491	BAT/49492	BAT/49493
Input Voltage (V)	230 ± 20%	400 ± 20%	400 ± 20%
Phase	1 phase	3 phase	3 phase
Output Voltage (V)	230 ± 20%	400 ± 20%	400 ± 20%
Output Current (A)	32	16	32
Total Power (kW)	7,4	11	22
Charging Interface	Type2	Type2	Type2
Operating Temperature	-30 °C to +60 °C	-30 °C to +60 °C	-30 °C to +60 °C
Storage Temperature	-40 °C to +80 °C	-40 °C to +80 °C	-40 °C to +80 °C
Protection Class	IP65	IP65	IP65
Weight (kg)	3,51	3,7	3,85
Dimension (W x H x D) (mm)	320 x 200 x 95	320 x 200 x 95	320 x 200 x 95

PORTABLE CHARGER

With a portable charger you can easily and safely charge your electric car from a standard household power outlet.



Reference	BAT/49494	BAT/49495
Install	plug TYPE 1	plug TYPE 2
Rated Voltage (V)	250	250
Rated Frequency (Hz)	50 / 60	50 / 60
Adjustable Current	6A min.- 16A max	6A min.- 16A max
Rated Power (kW)	3,8	3,8
Charging Cable Length	5m	5m
Operating Temperature	-30 °C to +65 °C	-30 °C to +65 °C
Storage Temperature	-40 °C to +80 °C	-40 °C to +80 °C
Protection Class	IP65	IP65
Control Box Size (mm)	255 x 109 x 55	255 x 109 x 55
Weight (kg)	3,4	3,4

CHARGING CABLE

A charging cable is an important part to safely charge your electric car. With a quality charging cable you can charge safely both at home and in public. As soon as the charging point is equipped with a Mennekes socket, you can charge with any charging cable.

A charging cable always consists of a rubber charging cable with a charging plug and a type 1 or type 2 charging plug depending on your type of vehicle.



Type 1



Type 2



Reference	BAT/49496	BAT/49497	BAT/49498	BAT/49499	BAT/49500	BAT/49501
Type plug	Type 1 - Type 2	Type 1 - Type 2	Type2 - Type 2	Type2 - Type 2	Type2 - Type 2	Type2 - Type 2
Rated Voltage (V)	AC 250	AC 250	AC 250	AC 480	AC 250	AC 480
Rated Current (A)	16 / Single Phase	32 / Single Phase	16 / Single Phase	16 / Three phase	32 / Single Phase	32 / Three phase
Charging Cable Length (m)	5	5	5	5	5	5
Operating Temperature	-30 °C to +65 °C	-30 °C to +65 °C	-30 °C to +65 °C	-30 °C to +65 °C	-30 °C to +65 °C	-30 °C to +65 °C
Storage Temperature	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
Protection Class	IP55	IP55	IP55	IP55	IP55	IP55

REPAIR

If you have a faulty charger or part, our electronics department can repair it and even provide you with a replacement during the period your part is being repaired.

Do you have old parts lying around? If they're repairable, we are interested in buying them! More info at page 150.



Accessories

BATTERY DATA LOGGER

BATTERY DATA LOGGER 12-80V - WI-FI



The ZTP-Drone battery datalogger can be programmed initially by WIFI, no interface needed.

▶ BAT/49206 (Universal)

The ZTP-Drone battery datalogger is connected to an industrial battery. All important parameters are measured as the total voltage of the battery, the current, the temperature and the level of the electrolyt.

New : also the voltage in the middle of the battery is measured to detect a defective cell. All these data are stored internally for more than 1 year if needed. The ZTP-Drone battery has several LED's to allow visual warnings as the low level of the electrolyt.

▶ BAT/49294 (Option)

The BAT/49294 is a ZTP-Drone battery datalogger with a canbus-connection to control the ZIVAN charger. The datalogger will take over the control of the charger to allow an optimal charging profile in function of the battery (automatic choice of voltage, current, etc based on type of battery, temperature, SOC% ...)

Optional:

The datalogger can be programmed by PC with following tools:

- CAN To USB Converter (ZIV/Z-C13105)
- CAN Cable (BAT/49317)

The datalogger can be programmed by WIFI:

- Internet connection of your PC by hardware cable or UMTS
- Datalogger connection by WIFI

TECHNICAL FEATURES

- Multivoltage 24-96V
- Dimensions 164x46x38 mm
- Input for voltage (+ ; - and middle voltage), current sensor (Hall), temperature sensor and electrolyt level sensor. The sensors are included
- Wifi communication
- Internal memory
- IP68

Supplied complete of:

- current sensor
- thermic sensor
- electrolyte level sensor

When the ZTP-Drone datalogger detects a local Wifi network, the data is send to the ZTP-Cloud application. The ZTP-Drone datalogger doesn't need a continuous Wifi network, it's sufficient to have a local network at the charger room. If there is no local Wifi network or you don't want to use your local network, a local Wifi hotspot with 4G is a good alternative.

The free ZTP-Cloud application converts all data of all your dataloggers to one main screen. This dashboard gives an overall view of the use of the batteries of each department, you can find easily all fault messages (high temperature, wrong charger, defective cells but also opportunity charging ...) and shows all detailed information of each battery in simple graphs for fast analysis. You can export all data to an excel datasheet.

In case of remarks the ZTP-Cloud always points out some actions to solve the problem

Actions required

More than 95% of the cycles appear to be incomplete charges.
 • Check the charging cycle is correct.
 • Check the use of the battery, avoiding opportunity charging.

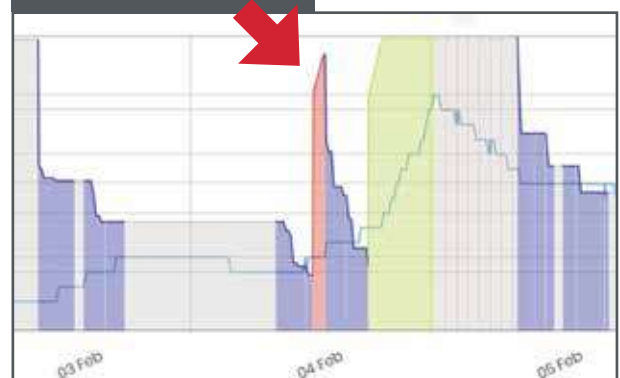
History

Alarm number	Cycle	Date	State	Alarm detail
1720	1778	Wednesday, February 26, 2020 8:44 PM	Warning	Warning high voltage
1781	1760	Wednesday, February 26, 2020 8:53 AM	Event	Event opportunity charge
1709	1760	Tuesday, February 25, 2020 7:17 PM	Warning	Warning high voltage
1698	1702	Tuesday, February 25, 2020 8:46 AM	Event	Event opportunity charge
1674	1694	Monday, February 24, 2020 9:45 AM	Event	Event opportunity charge

Simple graphics/interface



Warning opportunity charging



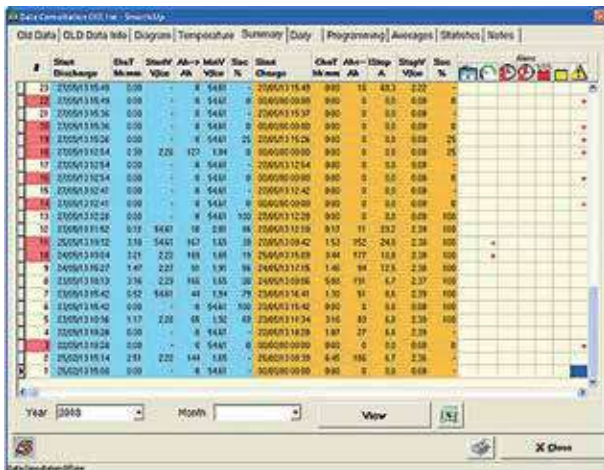
SMART.UP VERSION 24/36/48/72/80/96 VOLT

SmartUP is a device designed for the monitoring and control of lead batteries.

FEATURES

- Battery Monitoring devices
- Data Memory 400 working cycles
- For batteries 24/36/48/72/80/96V (12V available on request)
- Hall effect sensor
- Discharge time and capacity
- Battery faults and failures occurring during the charging process USB Flash memory for data downloading
- USB Cable for programming
- Possibility to connect with RS 485 & CAN BUS
- IP54 protection
- Working temperature -20° to +50°

SUMMARY



The data analysis can be done in an intuitive way. You can consult the "Monthly Summary" Tab.

On a table are shown all of the battery working cycles:

1. In blue the discharging phase
2. In orange the charging phase

The anomalies are indicated with red dots:

3. Low electrolyte level
4. Overdischarged Battery
5. Timer 1° phase
6. Timer 2° phase
7. Overrecharge
8. Low battery efficiency
9. Recharging not completed

OPTIONAL



▶ **BAT/47499**
USB cable



▶ **BAT/47500**
USB Flash drive



▶ **BAT/37099**

100 ÷ 340 Ah

▶ **BAT/37102**

350 ÷ 740 Ah

▶ **BAT/37100**

750 ÷ 1500 Ah

TECHNICAL DATA

Stored working cycles	400
Current and voltage graphic data	11400 samples (47 days setting Sampling Time = 6min)
Stored daily data	Last 30 days

WORKING RANGE

Current size: BAT/37099	Suitable for batteries from 100Ah to 340Ah
Current size: BAT/37102	Suitable for batteries from 350Ah to 740Ah
Current size: BAT/37100	Suitable for batteries from 750Ah to 1500Ah

ELECTRICAL DATA

Power supply min ÷ max	18V ÷ 144V
Average absorbed power	< 1.5W
Internal protection	Fuse at the supply port
Working temperature	-20°C ÷ +50°C

PHYSICAL DATA

Mechanical size	60mm x 60mm x 130mm
Weight	200g
Protection grade	IP 54

SUMMARY



400 working cycles stored (Discharge/Recharge)

- Discharging time and capacity
- Recharging time and capacity
- Detailed working data
- Battery faults during the battery use and recharge



Battery voltage and current diagrams

- Working cycle Data e Time
- Zoom capability



Accessories

BATTERY DATA LOGGER

The eGO! battery life monitor is the latest and most advanced battery life monitor available on the market, turning any lead-acid battery into a smart battery. This data can be used to:

- Improve maintenance procedures.
- Increase run-time and reduce costs.
- Assign accountability for battery abuse.

The wide range of metrics recorded by the eGO! can be used to improve the overall performance of a battery fleet.

Data is key. The eGO! unlocks the potential in your batteries, providing key metrics to help maximise performance.

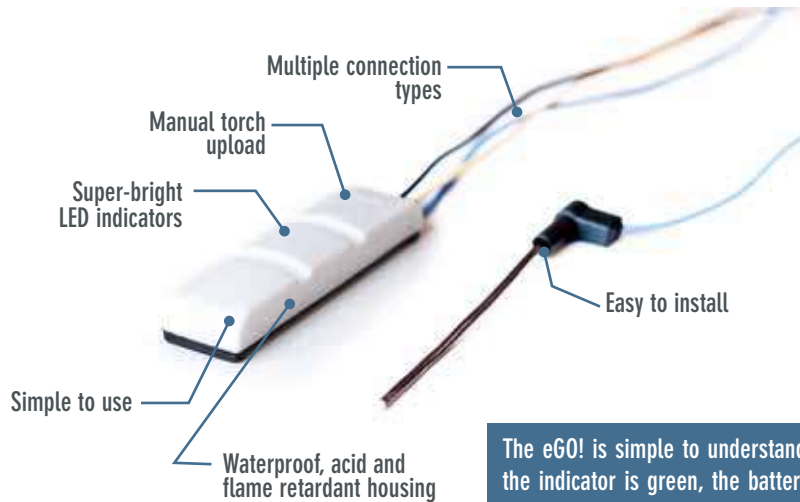
Reference	BAT/50603
Operating voltage	12V
Nominal Current	30 - 100mA
LED Indications	Amber: Over temperature Green: OK Red: Fill now Blue: Comms Operating
SmartDelay	24 hours (Standard) 5 Day (Optional)
SmartSense	Yes
Reverse Polarity protection	Yes
Housing	Translucent Overmold
Over-discharge threshold	80%
Connections	(S) M4 Steel Ring and Screw (Q) FlexiTap
Fuses	M4 FlexiTap
	1 x board, 2 x In-line 1 x board, 2 x FlexiTap
Warranty	1 Year
Flame retardant	Yes
M4 Connection	EGOC-12SE EGOC-12SG
FlexiTap connection	EGOC-12QE EGOC-12QC
Cable Colours(s)	Black (-), Yellow (+), Blue (P)
Flashing Patterns Flooded VRLA	OK / Fill Soon / Fill Now / Over temperature / Comms On Over temperature / Comms On
Dimensions Length Width Height	100mm 30mm 18mm
Weight Flooded VRLA	0,08kg (80g) 0,1kg (100g)

DATA DONE RIGHT

The data that the eGO! records is automatically captured and uploaded via our CloudLink gateway, giving you a fully integrated and seamless feedback loop. It tracks and records:

- Download data
- eGO! serial number
- Cell voltage at download
- Temperature at download
- Electrolyte status at download

From work, rest, charge, and cool down hours to opportunity and abuse cycles, once uploaded, the complete performance of a battery can be seen online.



The eGO! is simple to understand. When the indicator is green, the battery water levels are good, and when it is red, the battery needs water. Three green pulses and one red means fill soon. The orange indicates the battery is above temperature (40°C - Electrolyte / 37°C - Gel), and a blue LED indicates communication.

The eGO! has been designed with ease of use in mind and works perfectly with the eGO!Tools app. You can now trigger manual data uploads directly from the app, access a tailored site list, and review key metrics. This synchronisation gives battery room technicians complete flexibility, speeding up productivity, and efficiency.



Avoid unnecessary wear
 Maximise charge cycles
 Prolong battery lifespan



FOR A MORE EFFICIENT BATTERY-POWERED FLEET

Batteries are integral to your business. But you know how challenging they can be to manage. They're hard to replace. They're expensive. They're difficult to monitor.

Our battery monitoring system integrates seamlessly with GemOne's telematics or works as a standalone solution so you can monitor the health and status of your batteries and boost your fleet efficiency.

LOWER YOUR OPERATIONAL COSTS

Monitoring battery conditions, fillings, improper use, and service intervals allows you to significantly lower the costs of your operations.

BATTERY MONITORING SOLUTION

The batteries that power your industrial fleet drive your business forward. Avoid their unnecessary wear. Maximise their charge cycles. Prolong their lifespan. Our battery monitoring solution unleashes the potential of your battery-powered fleet.

GET REAL TIME INFORMATION

Get reports and warnings on all relevant battery parameters, including voltage, current, temperature, internal resistance, state of charge, and state of health.

INSTALL OUR SOLUTION EASILY

An easy to set up system which allows you to monitor all your batteries on one single platform.

Reference	BAT/50960	BAT/50961
Working voltage	8-95V ± 0.1V	50-150V ± 0.1V
Measuring Current	±300A ±0.5A	±800A ±0.5A
Interlock relay	20A@5V	
Working temperature	-20°C to 70°C	
Connectivity	Global 4G network	
Level sensor	Bayonet or drill hole	
Bluetooth low energy	4.2/5.0	
RS485	MODBUS	
General input	Support up to 80VDC input	



Accessories

BATTERY CONNECTORS



VOLTAGE COLOR COMBINATIONS

All S-connectors can function until 600V DC. When several electric devices with different voltages are used, it's recommended to choose a color code for every voltage! None of these colors are interchangeable! Only connectors with the same color are interchangeable!

The recommended Voltage/color combinations are:

Yellow: 12V	Blue: 48V
Orange: 18V	Green: 72V
Red: 24V	Black: 80V
Grey: 36V	Brown: 96V

DIMENSIONS OF THE BATTERY CONNECTORS

	TYPE	Y	X	H
	SB 50	36,5	47,6	15,9
	SB 175	55,6	79,4	25,4
	SB 350	69,8	108,0	33,3
	SBX 175	71,2	92,2	25,0
	SBX 350	85,7	125,4	33,3
	SBE 160	71,2	92,2	25,4
	SBE 320	85,7	125,4	33,3

SB-SERIES

2 pole connector available in 50, 175 & 350A for usage till 600V DC & AC. SB175 is also available in 3 pole.

SBX-SERIES

2 pole connector available in 175 & 350A for usage till 600V DC & AC. The SBX series have extra option to use auxiliary contacts.

SBE-SERIES

The SBE is a further development of the SBX connector. 2 pole connector available in 80, 160 & 320A for usage till 150V DC & AC.

The SBE160 is also available in 3 poles.

The SBE series have extra option to use auxiliary contacts.

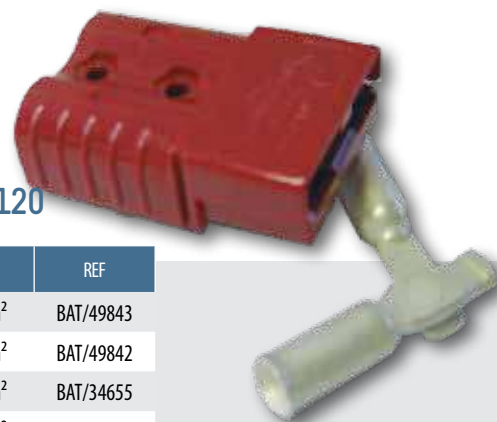


BATTERY CONNECTOR: SB / S 50

TYPE	color	V	cable	REF
SB / S 50	yellow	12V	16 mm ²	BAT/32713
SB / S 50	red	24V	6 mm ²	BAT/45879
SB / S 50	red	24V	16 mm ²	BAT/15995
SB / S 50	grey	36V	16 mm ²	BAT/15790

BATTERY CONNECTOR: SB120

TYPE	color	V	cable	REF
SB120	RED	24V	16mm ²	BAT/49843
SB120	RED	24V	25mm ²	BAT/49842
SB120	RED	24V	35mm ²	BAT/34655
SB120	GREY	36V	16mm ²	BAT/49845
SB120	GREY	36V	25mm ²	BAT/34656
SB120	GREY	36V	35mm ²	BAT/49844
SB120	BLUE	48V	16mm ²	BAT/49847
SB120	BLUE	48V	25mm ²	BAT/34657
SB120	BLUE	48V	35mm ²	BAT/49846





BATTERY CONNECTOR: SB/S175

TYPE	color	V	cable	REF
SB / S 175	yellow	12 V	50 mm ²	BAT/15440
	orange	18 V	50 mm ²	BAT/15996
	red	24 V	50 mm ²	BAT/15997
	grey	36 V	50 mm ²	BAT/15998
	blue	48 V	50 mm ²	BAT/15999



BATTERY CONNECTOR: SB/S350

TYPE	color	V	cable	REF
SB / S 350	yellow	12 V	70 mm ²	BAT/16000
	red	24 V	70 mm ²	BAT/16001
	grey	36 V	70 mm ²	BAT/15478
	blue	48 V	70 mm ²	BAT/16002
	green	72 V	70 mm ²	BAT/16003



BATTERY CONNECTOR: SBE 80

TYPE	color	V	cable	REF
SBE 80	red	24 V	16 mm ²	BAT/16144

BATTERY CONNECTOR: SBE / SAE 160 - SBX / SA 176

TYPE	color	V	cable	REF
SBE / SAE 160	yellow	12 V	50 mm ²	BAT/16008
	orange	18 V	50 mm ²	BAT/16009
	red	24 V	50 mm ²	BAT/15442
SBX / SA 176	grey	36 V	50 mm ²	BAT/15729
	blue	48 V	50 mm ²	BAT/15381
	green	72 V	50 mm ²	BAT/16010
	black	80 V	50 mm ²	BAT/16011

BATTERY CONNECTOR: SBE / SAE 160 - SBX / SA 176

TYPE	color	V	cable	REF
SBE / SAE 160	yellow	12 V	35 mm ²	BAT/16004
	orange	18 V	35 mm ²	BAT/16005
	red	24 V	35 mm ²	BAT/15377
SBX / SA 176	grey	36 V	35 mm ²	BAT/15396
	blue	48 V	35 mm ²	BAT/15397
	green	72 V	35 mm ²	BAT/16006
	black	80 V	35 mm ²	BAT/16007



BATTERY CONNECTOR: SBX / SA 350

TYPE	color	V	cable	REF
SBX / SA 350	yellow	12 V	70 mm ²	BAT/16012
	red	24 V	70 mm ²	BAT/17487
	grey	36 V	70 mm ²	BAT/16014
	blue	48 V	70 mm ²	BAT/15380
	green	72 V	70 mm ²	BAT/16015
	black	80 V	70 mm ²	BAT/16016

REDUCING BUSHING: TYPE SBE 160

cable	REF
4,83 mm ²	BAT/48625



BATTERY CONNECTOR: SBE / SAE 320

TYPE	color	V	cable	REF
SBE / SAE 320	yellow	12 V	70 mm ²	BAT/16017
	orange	18 V	70 mm ²	BAT/16018
	red	24 V	70 mm ²	BAT/16019
	grey	36 V	70 mm ²	BAT/16020
	blue	48 V	70 mm ²	BAT/15441
	green	72 V	70 mm ²	BAT/16021
	black	80 V	70 mm ²	BAT/15819
	brown	96 V	70 mm ²	BAT/16022
	violet	120 V	70 mm ²	BAT/16023



CONTACT SET (2pc)

TYPE	cable	REF
SB / S 50	16 mm ²	BAT/16508
SB / S 175	50 mm ²	BAT/16510
SBE / SAE 160 - SBX / SA 175	35 mm ²	BAT/16514
SBE / SAE 160 - SBX / SA 175	50 mm ²	BAT/16517
SB / S 350	70 mm ²	BAT/16520
SBX / SA 350	70 mm ²	BAT/16523
SBE / SAE 320	35 mm ²	BAT/16526

AUX. CONTACT KIT (2pc)

TYPE	cable	REF
SBX / SAE SBX / SA 175	1-4 mm ²	BAT/15437

Accessories

BATTERY CONNECTORS



BAT/17399 ▶



BATTERY CONNECTOR 3 POLE SB 3175

color	V	cable	REF
grey	36 V	50 mm ²	BAT/16676
Contact set (3 pcs)		50 mm ²	BAT/17747



BATTERY CONNECTOR 3 POLE SBE 3160



color	V	cable	REF
red	24 V	50 mm ²	BAT/17749
blue	48 V	50 mm ²	BAT/17751
Contact set (3 pcs)		50 mm ²	BAT/17753
Handle black			BAT/17399

AUX. CONTACT KIT: SB / SBE / SBX

TYPE	AWG	cable	REF
SB / SBE / SBX	18 - 12	1 - 4 mm ²	BAT/15437
Contact set (2 pcs)			

NYLON HANDLE



TYPE	color	REF
for SB 50	red	BAT/17755



NYLON HANDLE

TYPE	color	REF
for SB / SBX 175 / SBE 160	grey	BAT/15766
	red	BAT/15763
for SB / SBX 350 / SBE 320	grey	BAT/15820
	red	BAT/17330

HANDLE FOR BT

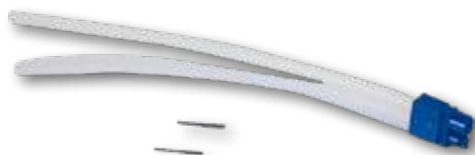


TYPE	color	REF
SBE 160 / SBX 175	black	BAT/17759



HANDLE FOR BT

TYPE	color	REF
SBE 160 / SBX 175	black	BAT/17761



AIR SYSTEM

TYPE	REF
SBE 160 / 320 - SBX 175 / 350	BAT/17557

EURO CONNECTOR

EURO CONNECTOR: V / F FT80



TYPE		cable	REF
FT80	V / F	16 mm ²	BAT/16067
	V / F	25 mm ²	BAT/16068
Contacts (pcs)		16 mm ²	BAT/16556
		25 mm ²	BAT/16559
Aux. contact kit (2 pcs)			BAT/16607
Handle for FT80 (red)			BAT/16624

EURO CONNECTOR: M FT80



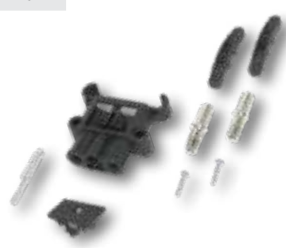
TYPE		cable	REF
FT80	M	16 mm ²	BAT/16065
	M	25 mm ²	BAT/16066
Contacts (pcs)		16 mm ²	BAT/16550
		25 mm ²	BAT/16553
Aux. contact kit (2 pcs)			BAT/16604
Handle for FT80 (red)			BAT/16624

**EURO CONNECTOR:
F EURO 80A - DIN 43589**



TYPE		cable	REF
80A	V / F	16 mm ²	BAT/47232
	V / F	25 mm ²	BAT/47233
	V / F	35 mm ²	BAT/47234

**EURO CONNECTOR:
F EURO 80A - DIN 43589
WITHOUT HANDLE**



TYPE		cable	REF
80A	V / F	16 mm ²	BAT/16070
	V / F	25 mm ²	BAT/15453
Contacts (pcs)		16 mm ²	BAT/16568
		25 mm ²	BAT/16571
Aux. contact kit (2 pcs)			BAT/16613
Handle for 80A (black)			BAT/15384

**EURO CONNECTOR:
M EURO 80A - DIN 43589
WITHOUT HANDLE**



TYPE		cable	REF
80A	M	16 mm ²	BAT/16069
	M	25 mm ²	BAT/15452
Contacts (pcs)		16 mm ²	BAT/16562
		25 mm ²	BAT/16565
Aux. contact kit (2 pcs) + adapter			BAT/16610
Handle for 80A (black)			BAT/15384

**METAL BATTERY HANDLE
EURO 160/320**



▶ **BAT/47893**
Metal handle

**BATTERY CONNECTOR:
F EURO 160A - DIN 43589**



TYPE		cable	REF
160A	V / F	25 mm ²	BAT/16072
	V / F	35 mm ²	BAT/15395
	V / F	50 mm ²	BAT/47231

Metal handle BAT/47893

**BATTERY CONNECTOR:
M EURO 160 A - DIN 43589
WITHOUT HANDLE**



TYPE		cable	REF
160A	M	25 mm ²	BAT/15797
	M	35 mm ²	BAT/15393
	M	50 mm ²	BAT/15394
Contacts (pcs)		25 mm ²	BAT/16574
		35 mm ²	BAT/16577
		50 mm ²	BAT/16580
Aux. contact kit (2 pcs)			BAT/16616
Handle (black)			BAT/15764

Metal handle BAT/47893

**BATTERY CONNECTOR:
F EURO 160A - DIN 43589 -
WITHOUT HANDLE**



TYPE		cable	REF
160A	V / F	25 mm ²	BAT/47953
	V / F	35 mm ²	BAT/48150
	V / F	50 mm ²	BAT/15389
Contacts (pcs)		25 mm ²	BAT/16583
		35 mm ²	BAT/16586
		50 mm ²	BAT/16589
Aux. contact kit (2 pcs)			BAT/16619
Handle (black)			BAT/15764

Metal handle BAT/47893

Accessories

BATTERY CONNECTORS

BATTERY CONNECTOR: F EURO 320 A - DIN 43589



TYPE		cable	REF
320A	V / F	50 mm ²	BAT/15793
	V / F	70 mm ²	BAT/15794
	V / F	95 mm ²	BAT/16077
Contacts (pcs)		50 mm ²	BAT/16598
		70 mm ²	BAT/16601
		95 mm ²	BAT/17806
Aux. contact kit (2 pcs) + adapter			BAT/16660
Handle (black)			BAT/15764

Metal handle BAT/47893

BATTERY CONNECTOR: M EURO 320 A - DIN 43589



TYPE		cable	REF
320A	M	50 mm ²	BAT/16074
	M	70 mm ²	BAT/16075
	M	95 mm ²	BAT/16076
Contacts (pcs)		50 mm ²	BAT/16592
		70 mm ²	BAT/16595
		95 mm ²	BAT/19589
Aux. contact kit (2 pcs) + adapter			BAT/16622
Handle (black)			BAT/15764

Metal handle BAT/47893

EURO CONNECTOR "AIR" Complete (case + adapter + handle + contacts)



TYPE	V/F	M
80 A	16 mm ²	BAT/17817 BAT/17730
	25 mm ²	BAT/17819 BAT/17732
160 A	25 mm ²	BAT/17739 BAT/15727
	35 mm ²	BAT/15728 BAT/16642
	50 mm ²	BAT/15726 BAT/16645
320 A	50 mm ²	BAT/16101 BAT/16102
	70 mm ²	BAT/16639 BAT/16650
80 A Contact aux. (1pc.)		BAT/17736
160 A Contact aux. (1pc.)		BAT/17829
320 A Contact aux. (1pc.)		BAT/17410
80 A Adapter blue		BAT/17734 BAT/17744
160 A Adapter blue		BAT/16194 BAT/17741
320 A Adapter blue		BAT/17263 BAT/17264

REMA MRC CONNECTORS

Molded REMA Connector



The MRC® Power Solution Series features:

- 75% current overload capability
- Fully compatible and interchangeable with existing cable and connector assemblies according to DIN 43589
- Connector housing and cable insulation material in one molded piece resulting in increased durability and environmental protection
- Acid-resistant housing and cable insulation
- RemaFlex® power cable suitable for applications requiring small bend radius
- Cable insulation and connector housing halogen free
- Operating temperature range: -40 °C to +120 °C
- Definition of new amperage classes:
 - MRC 120 > DIN 80
 - MRC 260 > DIN 160
 - MRC 400 > DIN 320



FEMALE CONNECTOR AND CABLE

Ref.	Amp (A)	Cable size (mm ²)	Lenght (mm)
BAT/50946	80	25	800
BAT/48862	80	25	1200
BAT/50950	160	35	1000
BAT/50951	160	35	1200
BAT/50952	160	35	1800
BAT/50953	160	50	1000
BAT/50954	160	50	1200
BAT/48676	160	50	1500
BAT/50955	160	50	1800
BAT/50956	320	70	1200
BAT/50957	320	95	2000
BAT/50958	320	95	2300



MALE CONNECTOR AND CABLE

Ref.	Amp (A)	Cable size (mm ²)	Lenght (mm)
BAT/50962	80	16	3000
BAT/48861	80	25	3000
BAT/50963	160	25	3000
BAT/50964	160	35	3000
BAT/50965	320	25	3000

BATTERY CONNECTOR PROTECTION



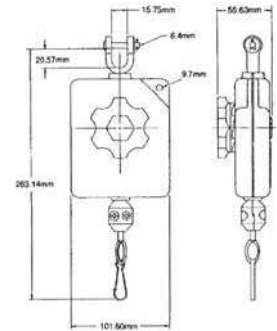
BAT/18931
Balancer 1-2 Kg
(1,6m)

BAT/18933
Support

BAT/36200
Bolt

BAT/17268
Brace

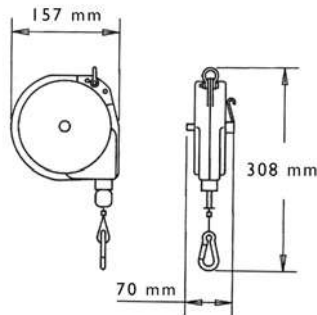
Standard-duty balancers 0,5 - 1,8 kg



- Long-life heavy-duty spring for lasting performance
- Easy tension adjustment, no tools required
- Full range of motion with 360° swivel hanger
- Quick installation
- Durable nylon cable for long life and reduced maintenance
- Convenient snap-type tool clip for easy tool handling
- Alignment of hanger and tool hook for smooth, efficient use

Ref	Cable travel (m)	Weight (kg)
BAT/50992	2	0,5 - 0,9
BAT/50993	2	0,9 - 1,8

Heavy-duty balancers 0,5 - 6,8 kg



- Easy tension adjustment, no special tools
- Heavy-duty steel construction for long life
- Easy spring replacement
- Long-lasting main spring designed to minimise spring flexing & fatigue
- Tool can be set in desired position with adjustable cable stop
- Durable 2,5 mm diameter stranded steel aircraft cable
- Ratchet lock holds cable in desired position

Ref	Cable travel (m)	Weight (kg)	Ratchet lock
BAT/50994	2,4	0,5 - 2,3	No
BAT/50995	2,4	0,5 - 2,3	Yes
BAT/50996	2,4	1,8 - 4,5	No

Complete

The connector saver offers a simple and inexpensive solution to a problem commonly to all users of electric trucks.

Potential problem:

Inadvertent damage to connectors and cabling results in high repair costs and replacements. Damaged cable is a fire and safety hazard.

Answer:

This is the only solution that retracts the cable safely whilst at the same time ensuring that there is virtually no tension on the battery connection during the charging operation. The complete kit with installation instructions includes: cable balancer – cable clamp – wall bracket and fixings. (several types available).

Ref	Cable length (mm)	Pull back force (kg)
BAT/51005	1600	1,8
BAT/51006	2000	2,7

Accessories

INDUSTRIAL PLUGS



INDUSTRIAL PLUGS 230V



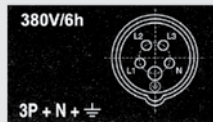
Female

Reference			Amp
BAT/37198	2P + \perp		16A
BAT/49528	2P + \perp		32A
BAT/49529	3P + \perp		16A
BAT/49530	3P + \perp		32A
BAT/49531	3P + N + \perp		16A
BAT/49532	3P + N + \perp		32A

Male

Reference			Amp
BAT/37196	2P + \perp		16A
BAT/37197	2P + \perp		32A
BAT/48855	3P + \perp		16A
BAT/48856	3P + \perp		32A
BAT/49533	3P + N + \perp		16A
BAT/49534	3P + N + \perp		32A

INDUSTRIAL PLUGS 380V

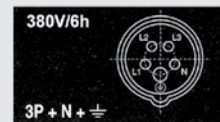


male

BAT/35613	16A
BAT/35614	32A

male

BAT/35615	16A
BAT/35390	32A

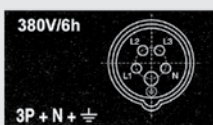
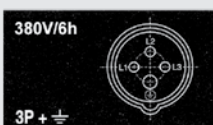


female

BAT/35920	16A
BAT/35922	32A

female

BAT/35924	16A
BAT/35926	32A



male

BAT/35928	16A
BAT/35930	32A

male

BAT/35932	16A
BAT/35934	32A



female

BAT/35936	16A
BAT/35938	32A

female

BAT/35940	16A
BAT/35942	32A

Accessories

MEASUREMENT AND TEST EQUIPMENT

DIGITAL HYDROMETER

▶ BAT/47703



CHARACTERISTICS

- Measuring range: - Density: 0 g/cm³ to 3 g/cm³
- Temperature: 0°C to 40°C
- Viscosity: 0 mPa.s to 1000 mPa.s
- Sample volume: 2 ml
- Dimensions (L x W x H): 140 x 138 x 27 mm
- Data memory: 1024 measured results
- Power supply: two 1,5V alkaline batteries

- Easy operation
- Compact, lightweight design enabling one-hand measurement
- No-hassle measurement of hard-to-reach samples
- Large LCD display with backlight
- Measuring cell with inspection window and backlight
- The communication is done via infra red, if your pc or laptop doesn't have a standard infra red access gate you need to use a USB to Infra red receiver.
- Install the driver on the laptop, connect the infra red stick in the pc and then put the digital hydrometer in front of the USB stick, then select export all data from the hydrometer and the data will be sent automatically to your desktop.

ACID HYDROMETER



▶ BAT/13883

Acid hydrometer

BATTERY CABLES

DOUBLE BATTERY CABLE: EXTRA FLEXIBLE



REF	Ø mm ²	color
BAT/39715	2 x 10	red / black
BAT/18689	2 x 16	red / black
BAT/18691	2 x 25	red / black
BAT/15762	2 x 35	red / black
BAT/18693	2 x 50	red / black

BATTERY CABLE: DOUBLE ISOLATED AND FLEXIBLE IN RUBBER



Ø mm ²	REF - Black	REF - Red
10	BAT/18676	BAT/18682
16	BAT/17682	BAT/17683
25	BAT/18678	BAT/18684
35	BAT/18680	BAT/18686
50	BAT/16416	BAT/16417
70	BAT/16414	BAT/16415

Accessories

WATER INJECTOR SYSTEMS

THE WORLD'S FASTEST BATTERY WATERING SYSTEM!



The Water Injector System™ is the world's fastest and most reliable way to add water to industrial batteries. This is eight times faster than filling a battery with a float-based system.

Each Injector has its own precision level-sensing valve enclosed in a protective housing. When the electrolyte level rises to the tip of the Injector, the valve shuts off instantly.

Low profile reduces risk of damage caused by battery cables (1.10 in. or 2.79 cm).



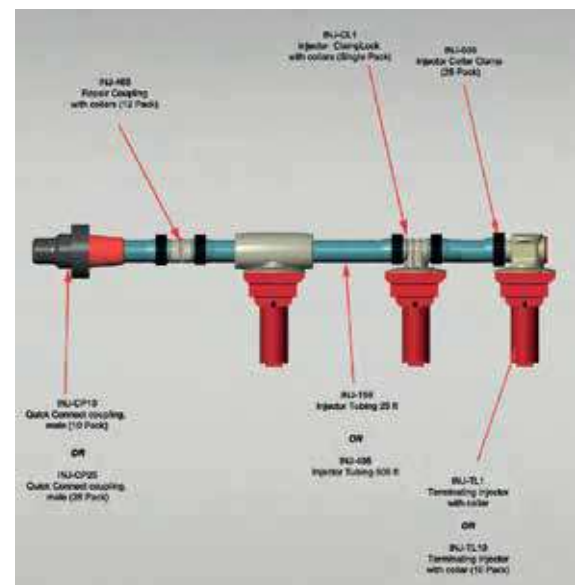
Snap-fit, rotatable base allows for easy installation; easy to snap into place.

PRODUCT SPECIFICATIONS

Input/Operating Pressure:	25 to 35 psi	Flow Rate:	8 to 10 gpm (30 to 38 lpm) per string
Acceptable Filling Temperature:	2° to 71°C	System Exposure Temperature:	-29° to 71°C
Valve Body Material:	Polypropylene	Tubing Material:	Proprietary flexible PVC
Max. Valve Height above Vent Opening:	2.79 cm	Fitting:	DIN Openings

FEATURES

- **Fast operation:** An average 18-cell industrial truck battery can be filled in 15 seconds or less.
- **Easy installation:** Flexible tubing and the snap-fit base make installation fast and easy.
- **Precise filling:** A precision level-sensing valve shuts off instantly when electrolyte levels rise to the Injector tip.
- **Safe:** Prevents direct contact with electrolyte during battery filling and prevents overfilling.
- **Compact:** Low profile allows Injectors to fit on any industrial battery and minimizes damage from battery cables. Injectors can snap in and out to allow inspection of electrolyte levels and specific gravities.
- **Heat resistant:** System will survive high battery temperatures without failing.
- **No-freeze tubing:** Tubing drains surplus water into cells after filling is complete, so the system can be used in cold storage environments.



HYDRO-CART MAX INJECTOR WATER SUPPLY



◀ BAT/48319

This sturdy polypropylene tank easily transports water to your batteries. Fill the tank from any available water source.

- Capacity: 75,7 liters
- AC powered
- 110 VAC / 60 Hz
- 6,1 meters of industrial hose
- 7,6 meters of power cord

Accessories

ELECTROLYTE LEVEL WARNING SYSTEMS



◀ BAT/48099 - Blinky

- LED blinks green when electrolyte is OK
- LED goes out when water is needed
- Reverse polarity protected
- Translucent overmold super bright LED
- Low-cost solution for electrolyte monitoring

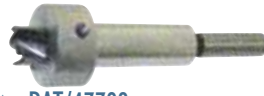


◀ BAT/15101 - SMARTBLINKY

- LED blinks green when electrolyte is OK
- LED blinks red when water is needed
- Super bright LED
- Eliminates false indication and maximizes watering intervals to prevent unnecessary watering
- 5-day delay option



DRILL FOR SMARTBLINKY CYCLOPS



▲ BAT/47708



◀ BAT/47707 - SMARTBLINKY CYCLOPS

- Ideal for batteries that don't leave the truck
- LED is mounted in a rugged connector which is located behind the battery connector
- Whenever battery is disconnected from the charger, LED is in the operatives hand so the warning signal can't be missed



◀ BAT/48171 - SMARTBLINKY PRO

- Intelligent battery monitoring system with light and sound
- SmartBlinky Pro produces an audible alarm that alerts you even when you can't see the battery. The signal informs you if a battery needs watering and the variable frequency even tells you how long the electrolyte level has been low
- Brightest light indication on the market
- Revolutionary ease of installation
- SmartBlinky Pro indication to avoid boil over



SMARTBLINKY TRAY MONITOR

The SmartBlinky Tray Monitor prevents costly damage from spills in the battery tray.

◀ BAT/48173

Let your batteries tell you when there is electrolyte in the tray.

When you clean or water your batteries there's a good chance corrosive electrolyte will end up in the battery tray due to run off from the cleaning process finding its way between the cells or following boil over after a battery is watered at the wrong time.

Easy to use:

With its bright red/blue LED the SmartBlinky TM is simple to use, a heart beat white LED flash means it is on, a red and blue flash means there is electrolyte in the tray.



SMARTBLINKY BATTERY TEMPERATURE MONITOR

The SmartBlinky BTM avoids costly damage to batteries through high temperatures.

◀ BAT/48172

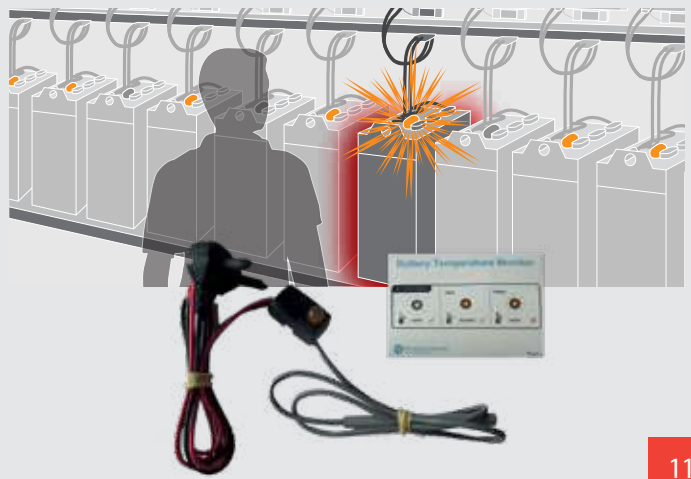
Let your batteries tell you when they are over temperature.

Using a lead acid battery over 40°C damages the battery and reduces its life span.

A good rule to remember is that for every 10 degrees over 40°C the battery cycle life halves; therefore, if the average lifetime temperature of a battery with a 1500 cycle life is 50°C it will only deliver 750 cycles.

Easy to use:

With its bright amber LED the SmartBlinky BTM is easy to use: A solid amber LED means alert and when it flashes it means the battery temperature is critical.



Accessories

BATTERY MANAGEMENT

iBOS®



- Get more performance from your batteries.
- Reduce labor costs.
- Don't use more batteries and chargers than you need.
- Make your batteries last longer.

HOW IT WORKS

The system knows when the chargers finish charging and a simple screen or pick light automatically tells the operator exactly which charger to get their next battery from. It is like a navigation system for your battery room!

BENEFITS

- **Simplified and directed battery selection:** This will make sure that all batteries are fully charged and properly cooled down. Operator judgment is eliminated.
- **Faster battery changes:** Save 2 to 5 minutes per change.
- **Fewer battery changes:** 30 minutes longer battery run time resulting in 10 to 20% fewer battery changes.
- **Longer battery life:** 6 months additional life due to longer battery cool down. This leads to fewer battery purchases each year.
- **More accurate battery purchases:** Right-size your battery fleet with information that saves tens of thousands of dollars per year.
 - Too many batteries:** Wastes capital. This is a very typical situation in most non-managed battery rooms.
 - Too few batteries:** Decreases productivity.
- **Greater battery room visibility:** Identify non-working equipment and problems in the battery room via management reports.

Model	Basic	Plus	Pro
Number of Chargers per Controller	50	100	350
Number of Battery Pools	1	9	9
Compatible with All Chargers	•	•	•
Blue "Pick Light" to Indicate Correct Battery	•	•	•
Universal Voltage Sentinel	•	•	•
Daisy Chain Wiring with Cable Included	•	•	•
Built-in Shouter	•	•	•
Built-in Touch Screen		•	•
7 Days On-Site Data		•	•
Built-in Configuration Wizard		•	•
Optional Web-Based Reporting		•	•
Optional 3G Modem for Web Connectivity		•	•
Optional Battery Tracker (Barcode)		•	•
Optional Charger Splitter		•	•
Optional Operations Display		•	•
Built-in UPS			•
Optional Wireless Display			•
Optional Remote Shouter			•
Optional Scrolling Displays			•





FEATURES

- SIMPLE OPERATION**
 A bright, easy to see blue LED tells you which charger to go to for the fully charged and most cooled down battery. The audible alarm quickly alerts users on any mispicks or potential issues.
- PROTECTED**
 The pick light is in an enclosed container protecting it from dirt and grime and the user interface is toughened to meet any environment.
- SIMPLE INSTALLATION**
 Installation can be completed with local maintenance staff and standard tools as no certified installation is required and no system configuration is needed.

BENEFITS

- BALANCED BATTERY SELECTION**
 Simplified and directed battery selection to make sure that all batteries are fully charged and properly cooled down.
- FASTER & FEWER CHANGES**
 Operators can save an average of 2 to 5 minutes per change. There will also be 10% to 20% fewer battery changes with an average 30 minutes longer battery run time.
- LONGER BATTERY LIFE**
 You can increase the life of each battery by an average of 6 months due to longer battery cool down times, which equates to fewer battery purchases each year.

iBOS Basic Controller

The iBOS® Basic saves money in your warehouse or facility by eliminating waste and increasing productivity. It the guesswork out of choosing the correct battery, the battery that is fully charged and most cooled down.



iBOS Plus Controller

This controller is capable of managing up to 100 chargers in up to 9 battery pools. This controller is designed for mid-size battery rooms that have single level battery racks. Configuration upon demand.



iBOS Pro Controller

This controller is designed for larger battery rooms that have multi-level battery racks and utilize a battery changer. Configuration upon demand.



Accessories

BATTERY DISCHARGE INDICATORS



MULTI-VOLTAGE BATTERY DISCHARGE INDICATOR



◀ **BAT/32561 - WITH HOUR COUNTER 24V - 80V**

Programmable multi-voltage battery discharge meter with hour counter. This battery indicator with hour counter & SMD-technology is based on a powerful microprocessor. One of the most important characteristics are the two touch buttons and a potentiometer on the back which make it possible to program according to the battery!
 At 70% depth of discharge, a flashing LED signals an "energy reserve" alert
 At 80% alternately flashing LEDs provide an "empty" status warning
 With pump cut-out - Ø 52 mm IP66



▲ **BAT/38510 - 24V - 80V**
 With pump cut-out - Ø 52 mm

BUZZER



◀ **BAT/45913**

Audio alarm when the battery is too deep discharged.
 Connectable on BAT/32561 & BAT/38510

BATTERY DISCHARGE INDICATOR



◀ **BAT/32146 - 12V- 24V**
 52 x 30 mm

LI-ION BATTERY CAPACITY INDICATOR



◀ **BAT/48769 - LI-ION BATTERY CAPACITY INDICATOR**

Ideal for all M+ and AQ-LITH® traction batteries. This indicator reads the CANBUS signals from the BMS and displays the SOC, voltage, current, temperature and all warnings.
 With potential-free contact for minimum State of Charge (adjustable)

LI-ION BATTERY CAPACITY INDICATOR FOR AQ-LITH® DROP-IN BATTERIES



Picture with 50A shunt

SOC (State of Charge) indicator based on coulomb counting

Max. current(A)	with contact MIN SOC%	With serial TTL communication
50	LIT/04.01.0200	LIT/04.01.0197
100	LIT/04.01.0201	LIT/04.01.0196
350	LIT/04.01.0203	LIT/04.01.0202
500	LIT/04.01.0205	LIT04.01.0204

Accessories

MAINTENANCE

BATTERY MAINTENANCE

Proper maintenance of the battery allows better performance and longer life.

Regular use of cleaning products provide you an unquestionable economic advantage. For these reasons, we offer a full range of cleaning products.



**BIO-
DEGRADABLE**



▶ **BAT/34502**

Battery Acid Cleaner & Neutralizer

Acid neutralizer and cleaner in spray. Cleans by acid affected surfaces and neutralizes the acid. The biodegradable "Solution Safe" maintenance products neutralize, clean (on the basis of citrus) and dissolve the corrosion of terminals, cables, plugs and containers. These products change of color when they come in contact with electrolyte (acid). In this way, the mechanic knows if there are acid radicals present. Easy in use: sprinkle and rinse. The waste water is harmless. 946 ml.

▶ **BAT/34506 - "Heavy Duty"**

Battery Acid Corrosion & Neutralizer

Acid neutralizer in spray: to neutralise bad corrosion by acid. This aggressive neutralizer is especially developed for tenacious corrosion, breaks down all corrosion: extremely efficient! 946 ml.



◀ **BAT/15214 : AQ-Cleaner**

Battery Neutralisator & Protector with color indicator
Prevents battery corrosion.
Prevents leakage current. Prolongs the battery life. Colors red when it gets in touch with acid. Colors green by neutralization. 400 ml.



◀ **BAT/48108**

Anti-corrosion gel
Prevents corrosion at the terminals! Easy to bring on: with little brush attached to the lid. Tin 227 g.



◀ **BAT/15152**

Tube anti-corrosion fat

Accessories

COMPONENT LIST FOR TRACTION BATTERIES



STANDARD FILLING PLUG

◀ **BAT/16277**
Manual filler cap Ø 35, color black



STANDARD AUTOMATIC FILLING PLUG

◀ **BAT/17368**
automatic standard filler cap = Europush = Push-in

MANUAL FILLING PLUG WITH REGENERATION FUNCTION



◀ **BAT/31572**
Reconverts the water vapours as much as possible in fluid. Adjustable height. Push-in connection



AUTOMATIC FILLING PLUG (BS)

◀ **BAT/45641**

PUSH-IN FILLING PLUG (BS) WITH FLOAT HOUSING



◀ **BAT/48164** with floater 54
BAT/48165 with floater 58
BAT/48166 with floater 62
BAT/48167 with floater 66
BAT/48168 with floater 70



BAT/45698 ▶

KIT AUTOMATIC FILLING SYSTEM

Automatic filling plug (type Europush 35), floater, hose, connectors, filter, link (M), end cap ...



KIT	VOLTAGE	FLOATER
BAT/44547	12V	34
BAT/42417	12V	39
BAT/20178	24V	14
BAT/20180	24V	20
BAT/20182	24V	24
BAT/20175	24V	29
BAT/20185	24V	34
BAT/20012	24V	39
BAT/45439	24V	44
BAT/20188	24V	49
BAT/20190	24V	59
BAT/20239	36V	14
BAT/20241	36V	20
BAT/20243	36V	24
BAT/20245	36V	29

KIT	VOLTAGE	FLOATER
BAT/20247	36V	34
BAT/20249	36V	39
BAT/20251	36V	49
BAT/20253	36V	59
BAT/20192	48V	14
BAT/20194	48V	20
BAT/20196	48V	24
BAT/20177	48V	29
BAT/20199	48V	34
BAT/20201	48V	39
BAT/41909	48V	44
BAT/20203	48V	49
BAT/20205	48V	59
BAT/20223	72V	14
BAT/20225	72V	20

KIT	VOLTAGE	FLOATER
BAT/20227	72V	24
BAT/20229	72V	29
BAT/20231	72V	34
BAT/20233	72V	39
BAT/20235	72V	49
BAT/20237	72V	59
BAT/20207	80V	14
BAT/20209	80V	20
BAT/20211	80V	24
BAT/20213	80V	29
BAT/20215	80V	34
BAT/20217	80V	39
BAT/20219	80V	49
BAT/20221	80V	59



BAT/12420
Current indicator



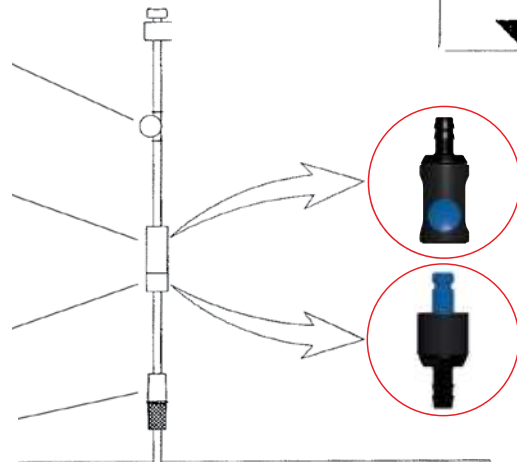
BAT/12419 (20L.)
BAT/15832 (60L.)
Receptacle

min 2 meter

BAT/15229
Link female

BAT/16298
Link male

BAT/16290
Filter H₂O

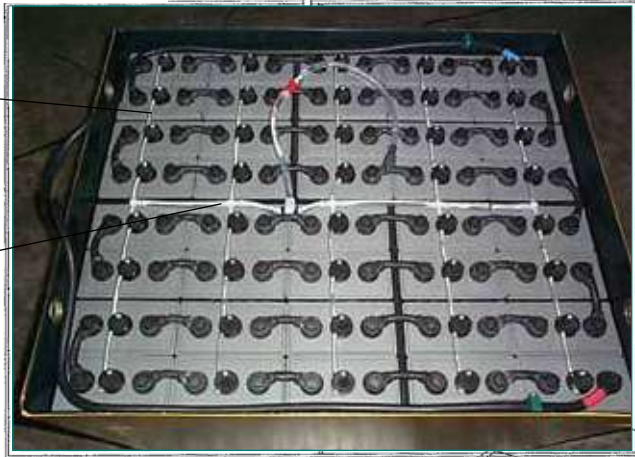


BAT/16287

Hose Ø 6 mm

BAT/16286

Hose Ø 10 mm

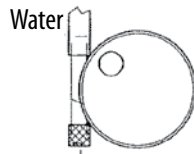


Connector

- "L" 6-10
- BAT/16293
- "L" 10-10
- BAT/16297
- "T" 6-10-6
- BAT/17354
- "T" 10-6-10
- BAT/16295
- "T" 10-10-10
- BAT/17356
- "X" 6-10-6-10
- BAT/16292
- "X" 10-10-10-10
- BAT/16291



BAT/17361
End cap



Water

Gas filter

Accessories

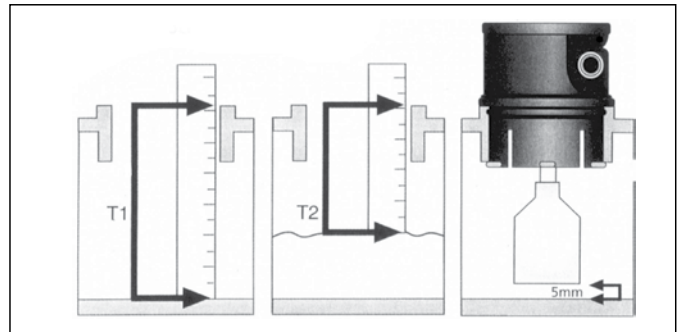
COMPONENT LIST FOR TRACTION BATTERIES

SET-UP

1. Determine the right battery filling plug by type and brand of the battery.
2. Determine the length of the float of T1 and T2.
3. Determine the length of the plastic tubes.
4. Install the tubes for the central water-filling system.

SELECT THE RIGHT BATTERY FILLING PLUG

Bajonet Euro 35 M27 M30



DETERMINATION OF THE FLOAT

- T1** Determine the distance between the top of the battery plates to the top of the battery cell opening.
- T2** Determine the distance between the battery fluid and the top of the battery cell opening.
- T3** Verify after selecting the float the free space, which has to be at least 5 mm.

BAT/float nr	BAT/17374	BAT/17375	BAT/17376	BAT/17377	BAT/17378	BAT/17379	BAT/17380	BAT/17381
	T1 T2	T1 T2	T1 T2	T1 T2	T1 T2	T1 T2	T1 T2	T1 T2
Europush 35	42/29	47/34	51/39	56/42	61/46	66/50	76/57	86/66
Bayonet connection	27/14	33/20	37/25	42/28	47/32	52/36	62/43	72/42
Screw thread M27/M30	30/17	36/23	40/28	45/31	50/35	55/39	65/46	75/45

FLOATS



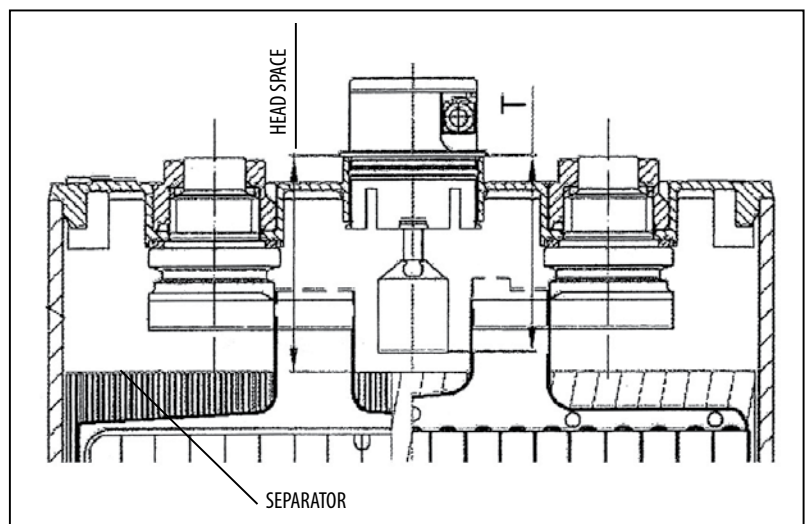
Reference	BAT/17374	BAT/17375	BAT/17376	BAT/17377	BAT/17378	BAT/17379	BAT/41910	BAT/17380	BAT/17381
Dimensions	07 / 22 / 14	07 / 22 / 20	07 / 22 / 24	07 / 22 / 29	07 / 22 / 34	07 / 22 / 39	07 / 22 / 44	07 / 22 / 49	07 / 22 / 59

INSTALLATION AUTOMATIC FILLING SYSTEM

- 1) Place the adapted floats on the filling plugs, which are determined by the cell type.

The distance from the cell top to the bottom of the float (T) must be at least 5 mm less than the distance from the cell top to the separator (head-space).

- 2) Place the filling plugs in the cell.
- 3) Connect the filling plugs with the adjusted materials.



SLIDE RULER



▲ **BAT/47527**



▲ **BAT/12419**

20-litre gravity tank with tap
X x Y x H: 353 x 165 x 446

▲ **BAT/15145**

Kit water tank 20L (Water tank, tube 3 m, indicator, link (F))



▲ **BAT/15832**

60-litre gravity tank with tap
X x Y x H: 460 x 350 x 500

▲ **BAT/15144**

Kit water tank 60L (Water tank, tube 3 m, indicator, link (F))



▲ **BAT/16286**

Water hose

BAT/16287 : Ø 6

BAT/22105 : Ø 8

BAT/16286 : Ø 10

BAT/45391 : Ø 12

AUTOMATIC FILLER CAPS WITH CENTRAL DEGASSING



◀ **BAT/48546**

Push-in plug central degassing double connector



◀ **BAT/20297**

Europush - Euro 35
Push-in plug central degassing single connector
End-plug

FEMALE CONNECTOR WATER

type	Connexion A	PA 11	d	AF	l	t	weight
BAT/15227	7 mm	•	24	22	68,3	25	16
BAT/15229	10 mm	•	24	22	73,3	30	17
BAT/15242	13 mm	•	24	22	73,3	30	19



MALE CONNECTOR WATER

type	Connexion A	PA 11	d	AF	l	t	n	weight
BAT/15243	7 mm	•	24	22	66,5	25	20	10
BAT/16298	10 mm	•	24	22	71,5	30	20	10
BAT/15244	13 mm	•	24	22	71,5	30	20	12



FEMALE CONNECTOR AIR

type	Connexion A	PA 11	d	AF	l	t	weight
BAT/47530	7 mm	•	24	22	68,3	25	16
BAT/47531	10 mm	•	24	22	73,3	30	17



MALE CONNECTOR AIR

type	Connexion A	PA 11	d	AF	l	t	n	weight
BAT/47532	7 mm	•	24	22	66,5	25	20	10
BAT/47533	10 mm	•	24	22	71,5	30	20	10



Accessories

COMPONENT LIST FOR TRACTION BATTERIES



▲ **BAT/33823**

Water filter with flow indicator NW6



▲ **BAT/12420**

Flow indicator with inner diameter 10mm



▲ **BAT/16290**

Water filter

▲ **BAT/33825**

Water filter with flow indicator NW10

VALVE FOR ACID CIRCULATION



▲ **BAT/21004**

Valve for acid circulation AT

TUBE FOR ACID CIRCULATION



▲ **BAT/16331**

Tube for acid circulation. H = 640 mm

L-CONNECTOR



▲ **BAT/34418**

L connector for acid circulation AT (without tube)

T-CONNECTOR



▲ **BAT/34419**

T connector for acid circulation AT (without tube)

T-CONNECTOR 90°>H655



▲ **BAT/34420**

T connector 90° for acid circulation AT (without tube)

FILTER-EX FOR CENTRAL DEGASSING



▲ **BAT/47526**

FilterEX for central degassing

CHARACTERISTICS

The use of the filterEX on batteries prevents:

- a flash-back of Hydrogen fire
- followed by a chain reaction between the battery cells

REQUIREMENTS

Normally, the filterEX is used in combination with the central degassing bfs plug

(A51210), where all cells are inter-connected through the degassing hoses in addition to the normal water hoses.

FilterEX will protect the battery under any of the following circumstances:

- An ignition from an external source - flame

propagation can be avoided by filterEX - mounted at the end of the degassing hose)

- An ignition source inside one of the battery cells - a propagation of the flame can be prevented by filterEX mounted after each plug

HANDLING

- The piping should be installed in such way that there are not more than 10 bfs plugs connected to one filterEX.
- The filterEX should be replaced after approximately 300 cycles, respectively when the white insert becomes discoloured. Replacement frequency depends on the gas discharge volume per battery cells.

REDUCER



◀ BAT/17277: 10/6

“L” CONNECTORS



◀ BAT/21762: 6/0

◀ BAT/19814: 6/6

◀ BAT/16293: 10/6

◀ BAT/16297: 10/10

“T” CONNECTORS



◀ BAT/17356: 10/10/10

◀ BAT/16295: 10/6/10

◀ BAT/17354: 6/10/6

◀ BAT/21764: 6/6/6

“X” CONNECTORS



◀ BAT/16291: 10/10/10/10

◀ BAT/16292: 6/10/6/10

◀ BAT/21766: 6/6/6/6

WASH LOCKER



◀ BAT/22107: Ø 14 mm

◀ BAT/22109: Ø 9 mm

END CAP



◀ BAT/21097



PLUG LIFTER

▲ BAT/47535

PROTECTION CAP

◀ BAT/34730: Protection cap for male link RC



SLIDE TOOL

▲ BAT/47536

Tool to fix wash locker

ASSEMBLING TOOL



▲ BAT/47534

To ease and quicken the assembly of a filler cap.



Accessories

COMPONENT LIST FOR TRACTION BATTERIES

FLEXIBLE INTERCELL CONNECTOR

Screwed cable connections



Reference	Ø mm ²	length mm	Reference	Ø mm ²	length mm
BAT/16225	25	75	BAT/16248	50	170
BAT/16226	25	85	BAT/16249	50	190
BAT/16227	25	95	BAT/16250	50	210
BAT/16228	25	110	BAT/16251	50	250
BAT/16229	25	130	BAT/16252	50	300
BAT/16233	35	75	BAT/16253	50	350
BAT/12444	35	85	BAT/34768	70	95
BAT/16234	35	95	BAT/45713	70	110
BAT/16235	35	110	BAT/34773	70	130
BAT/16236	35	130	BAT/34776	70	150
BAT/16237	35	150	BAT/34778	70	170
BAT/16238	35	170	BAT/34780	70	190
BAT/16239	35	190	BAT/34782	70	210
BAT/34760	50	75	BAT/47009	95	95
BAT/16244	50	95	BAT/47010	95	130
BAT/16245	50	110	BAT/47011	95	170
BAT/16246	50	130	BAT/34795	95	210
BAT/16247	50	150	BAT/47012	95	250



◀ BAT/16216

End cable screwed

Reference	Ø mm ²	length mm	Reference	Ø mm ²	length mm
BAT/16216	25	1500	BAT/16220	25	2000
BAT/16217	35	1500	BAT/16221	35	2000
BAT/16218	50	1500	BAT/16222	50	2000
BAT/16219	70	1500	BAT/16223	70	2000



◀ BAT/47481

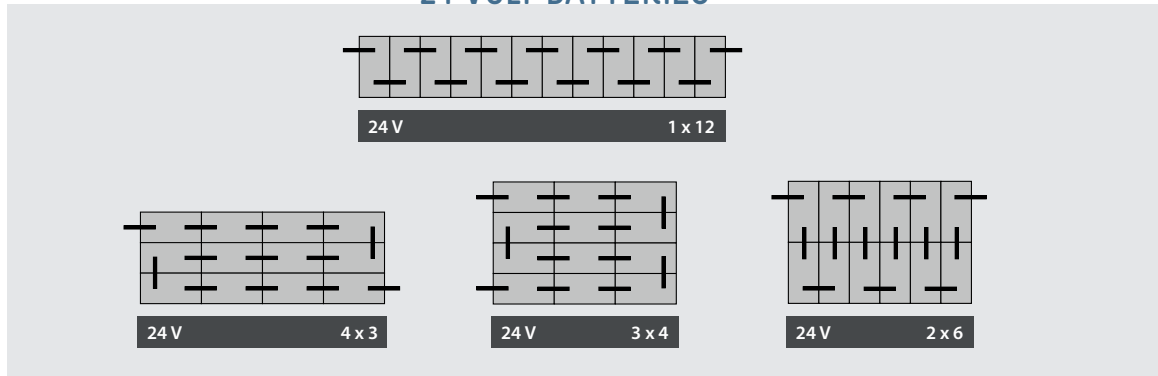
End cable with fuse

Reference	Ø mm ²	length mm	fuse	Reference	Ø mm ²	length mm	fuse
BAT/47481	35	1000	500A	BAT/47477	50	1500	400A
BAT/47482	35	1200	300A	BAT/47475	50	1500	500A
BAT/45672	35	1500	300A	BAT/48090	50	2000	500A
BAT/47483	35	1500	400A	BAT/47478	70	1200	250A
BAT/47476	50	1200	250A	BAT/47479	70	1500	400A

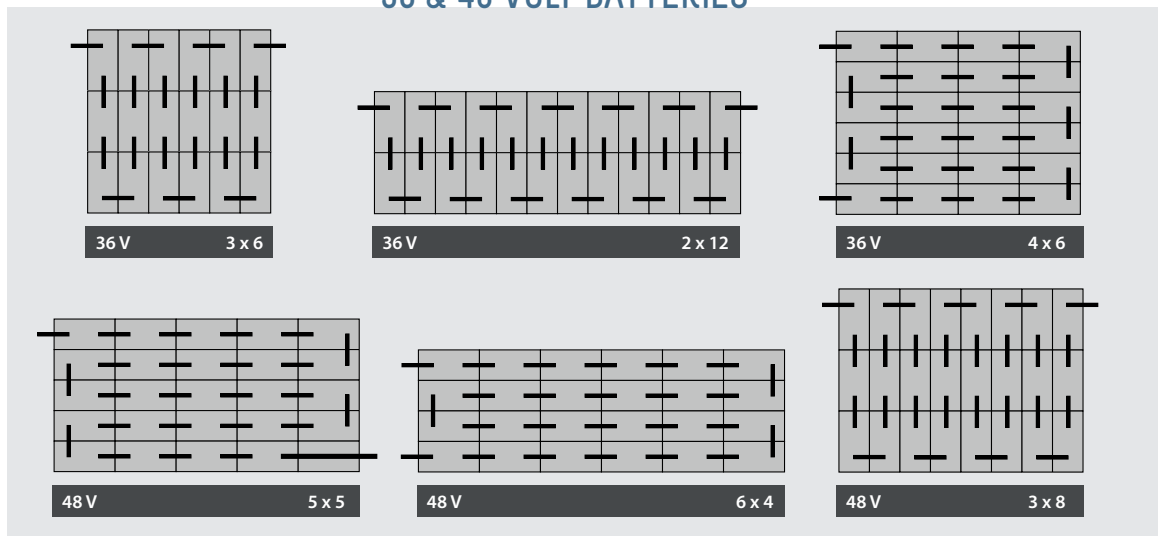
RECOMMENDED DIAMETER MM² CONNECTORS

0 - 250 Ah	25 mm ²	250 - 500 Ah	35 mm ²	500 - 750 Ah	50 mm ²	750 Ah - ...	70 mm ²
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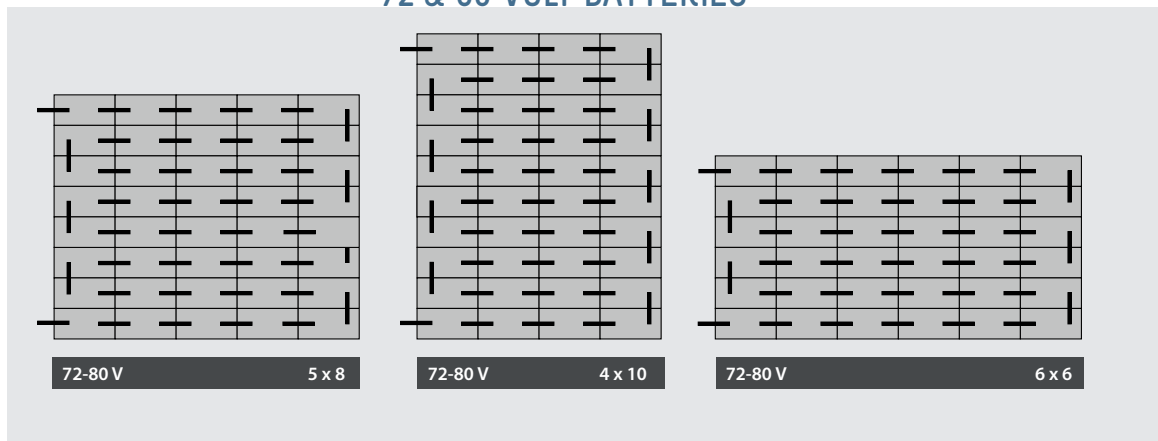
24 VOLT BATTERIES



36 & 48 VOLT BATTERIES



72 & 80 VOLT BATTERIES



▲ **BAT/12446**

Black bolt M10x22 for screwed connections



▲ **BAT/19799**

Bolt M10x23 with aux. Contact



▲ **BAT/46046**

Black bolt M10x18 for screwed connections

Accessories

COMPONENT LIST FOR TRACTION BATTERIES



▲ BAT/22161

Fixation for cable diameter = 35

▲ BAT/22163

Fixation for cable diameter = 50

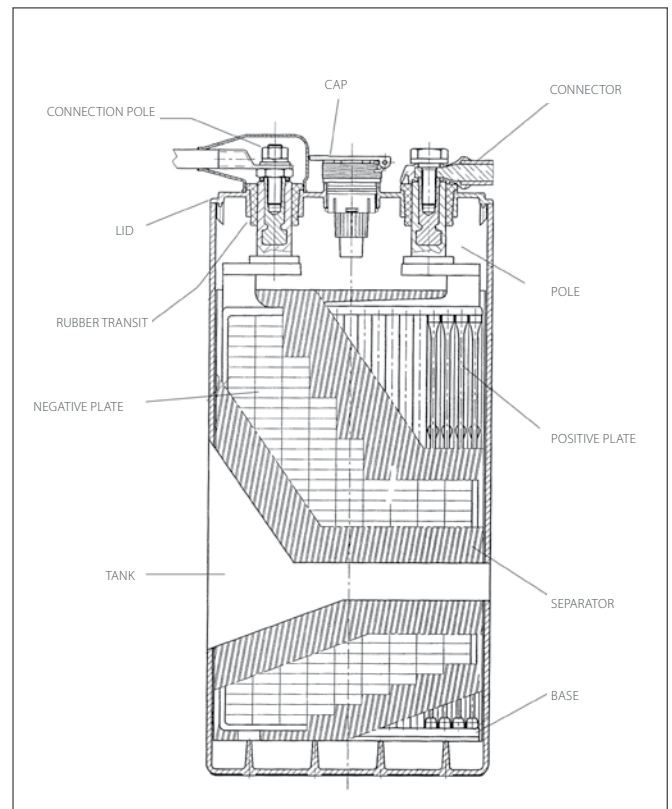
▲ BAT/22165

Fixation for cable diameter = 70



▲ BAT/22167

Fixation for cable diameter = 25



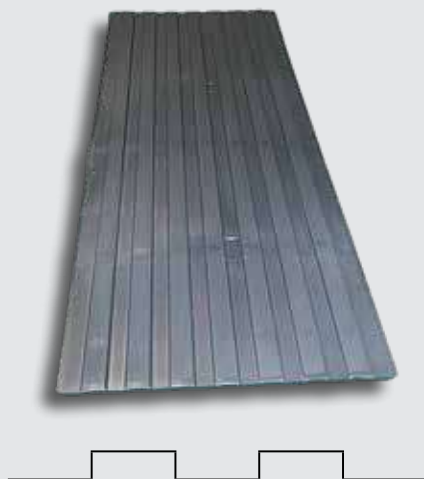
▲ BAT/16305

+ red

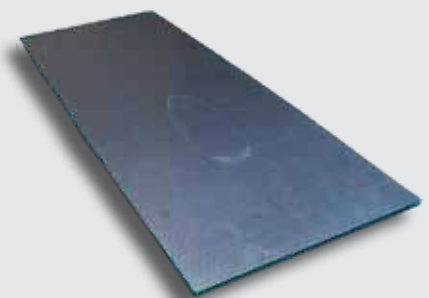
▲ BAT/16306

- blue

SPACER PLATES



REF	Size
BAT/12470	200 x 400 x 5 mm
BAT/21869	200 x 400 x 15 mm
BAT/21871	200 x 400 x 20 mm
BAT/12471	200 x 450 x 5 mm
BAT/21873	200 x 455 x 15 mm
BAT/21875	200 x 455 x 20 mm
BAT/12474	200 x 560 x 5 mm
BAT/21885	200 x 560 x 15 mm
BAT/21887	200 x 560 x 20 mm
BAT/21889	200 x 690 x 15 mm
BAT/21891	200 x 690 x 20 mm
BAT/21893	200 x 405 x 5 mm



REF	Size
BAT/12466	690 x 2000 x 5 mm
BAT/34871	690 x 2000 x 10 mm

ELEMENT CONTAINER

▼ BAT/21971

Element container grey



REF	Description	Height	REF	Description	Height
BAT/21971	2555-SH65 PF 20	330 mm	BAT/22203	25105-SH120 PF 30	565 mm
BAT/21973	3555-SH65 PF 20	330 mm	BAT/22205	35105-SH120 PF 30	565 mm
BAT/21975	4555-SH65 PF 20	330 mm	BAT/22207	45105-SH120 PF 30	565 mm
BAT/21977	5555-SH65 PF 20	330 mm	BAT/22209	55105-SH120 PF 30	565 mm
BAT/21979	6555-SH65 PF 20	330 mm	BAT/22211	65105-SH120 PF 30	565 mm
BAT/21981	7555-SH65 PF 20	330 mm	BAT/22213	75105-SH120 PF 30	565 mm
BAT/21983	8555-SH65 PF 20	330 mm	BAT/22215	85105-SH120 PF 30	565 mm
BAT/21985	9555-SH65 PF 20	330 mm	BAT/22217	95105-SH120 PF 30	565 mm
BAT/21987	10555-SH65 PF 20	330 mm	BAT/22219	105105-SH120 PF 30	565 mm
BAT/21989	12555-SH65 PM 20	330 mm	BAT/22221	125105-SH120 PF 30	565 mm
BAT/21991	2570-SH80 PF 20	400 mm	BAT/22223	125105-SH120 PM 30	565 mm
BAT/21993	3570-SH80 PF 20	400 mm	BAT/21249	25125-SH150 PM 50	690 mm
BAT/21995	4570-SH80 PF 20	400 mm	BAT/21250	35125-SH150 PM 50	690 mm
BAT/21997	5570-SH80 PF 20	400 mm	BAT/21251	45125-SH150 PM 50	690 mm
BAT/21999	6570-SH80 PF 20	400 mm	BAT/21252	55125-SH150 PM 50	690 mm
BAT/22001	7570-SH80 PF 20	400 mm	BAT/21253	65125-SH150 PM 50	690 mm
BAT/22003	8570-SH80 PF 20	400 mm	BAT/22230	75125-SH150 PM 50	690 mm
BAT/22005	9570-SH80 PF 20	400 mm	BAT/22232	85125-SH150 PM 50	690 mm
BAT/22007	10570-SH80 PF 20	400 mm	BAT/22234	95125-SH150 PM 50	690 mm
BAT/22009	12570-SH80 PF 20	400 mm	BAT/22236	105125-SH150 PM 50	690 mm
BAT/22011	12570-SH80 PM 20	400 mm	BAT/22238	125125-SH150 PM 50	690 mm
BAT/22013	2580-SH92 PF 30	460 mm	BAT/22240	25100D-SH115D PM 45	555 mm
BAT/22015	3580-SH92 PF 30	460 mm	BAT/22242	35100D-SH115D PM 45	555 mm
BAT/22017	4580-SH92 PF 30	460 mm	BAT/22244	45100D-SH115D PM 45	555 mm
BAT/22019	5580-SH92 PF 30	460 mm	BAT/22246	55100D-SH115D PM 45	555 mm
BAT/22021	6580-SH92 PF 30	460 mm	BAT/22248	65100D-SH115D PM 45	555 mm
BAT/22023	7580-SH92 PF 30	460 mm	BAT/22250	75100D-SH115D PM 45	555 mm
BAT/22025	8580-SH92 PF 30	460 mm	BAT/22252	85100D-SH115D PM 45	555 mm
BAT/22027	9580-SH92 PF 30	460 mm	BAT/22254	95100D-SH115D PM 45	555 mm
BAT/22029	10580-SH92 PF 30	460 mm	BAT/22256	105100D-SH115D PM45	555 mm
BAT/22031	12580-SH92 PM 30	460 mm	BAT/22258	125100D-SH115D PM45	555 mm
BAT/22033	2595-SH110 PF 20	510 mm	BAT/22260	25H50 PF 10	265 mm
BAT/22035	3595-SH110 PF 20	510 mm	BAT/22263	35H50 PF 10	265 mm
BAT/22037	4595-SH110 PF 20	510 mm	BAT/22265	45H50 PF 10	265 mm
BAT/22169	5595-SH110 PF 20	510 mm	BAT/22267	55H50 PF 10	265 mm
BAT/22171	6595-SH110 PF 20	510 mm	BAT/22269	65H50 PF 10	265 mm
BAT/22173	7595-SH110 PF 20	510 mm	BAT/22271	75H50 PF 10	265 mm
BAT/22175	8595-SH110 PF 20	510 mm	BAT/22273	85H50 PF 10	265 mm
BAT/22177	9595-SH110 PF 20	510 mm	BAT/22275	95H50 PF 10	265 mm
BAT/22179	10595-SH110 PF 20	510 mm	BAT/22277	105H50 PF 10	265 mm
BAT/22181	12595-SH110 PM 20	510 mm	BAT/22279	125H50 PM 10	265 mm
BAT/22183	25100-SH115 PF 20	530 mm	BAT/22281	25H160 PF 45	715 mm
BAT/22185	35100-SH115 PF 20	530 mm	BAT/22283	35H160 PF 45	715 mm
BAT/22187	45100-SH115 PF 20	530 mm	BAT/22285	45H160 PF 45	715 mm
BAT/22189	55100-SH115 PF 20	530 mm	BAT/22287	55H160 PF 45	715 mm
BAT/22191	65100-SH115 PF 20	530 mm	BAT/22289	65H160 PF 45	715 mm
BAT/22193	75100-SH115 PF 20	530 mm	BAT/22291	75H160 PF 45	715 mm
BAT/22195	85100-SH115 PF 20	530 mm	BAT/22293	85H160 PF 45	715 mm
BAT/22197	95100-SH115 PF 20	530 mm	BAT/22295	95H160 PF 45	715 mm
BAT/22199	105100-SH115 PF 20	530 mm	BAT/22297	105H160 PF 45	715 mm
BAT/22201	125100-SH115 PM 20	530 mm	BAT/22299	125H160 PM 45	715 mm

Accessories

EQUIPMENT

CABLE PINCERS



▲ BAT/15153

Cable cutter for cables up to 70mm².
For soft copper cable only.



▲ BAT/36046

Isolated torque wrench



▲ BAT/47709

Socket 22 mm 3/8" 6 point

MECHANIC CRIMPING TOOL

To squeeze the cable contacts (for battery connectors etc).



▲ BAT/18969

Pressure: 60 kN
Length: 620 mm
Different diametres for following cables:

Cable in mm²

10 mm ²	50 mm ²
16 mm ²	70 mm ²
25 mm ²	95 mm ²
35 mm ²	120 mm ²



▶ BAT/15173

Battery filler



▶ BAT/15167

Acid proof funnel



◀ BAT/21651

Mechanical grip pliers,
10 - 70 mm WM, ditto
like here above, but
squeezes 6 sides.



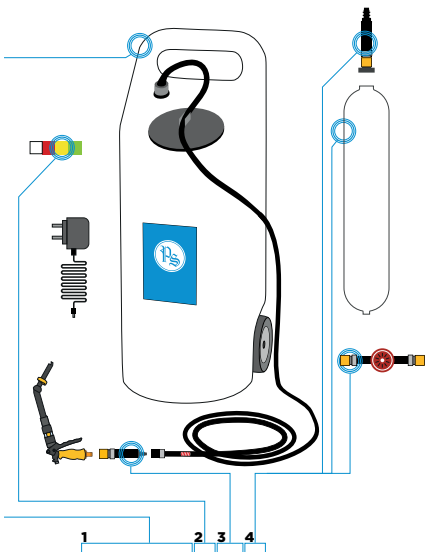
▶ BAT/18809 - 1 L

▶ BAT/19457 - 2 L

Automatic battery filler (1 litre). Stops automatically when the desired level is reached.

Accessories

FILLING PUMPS & GUNS



HYDROFILL™ PRO

WATER WHEN YOU NEED IT, WHERE YOU NEED IT

FEATURES

- 60 liter tank
- Tactile LCD display
- Integrated deioniser
- Cartridge & timer
- Battery powered
- Purity sensor
- Discharge indicator
- Low water alert
- Diagnostic information
- Multi-language
- Gun-X + adapter



▶ BAT/48311

The HydroPure™ deioniser cartridge fits inside the #HydroFill™ PRO making it the only mobile water cart with an integrated deioniser. You can now make pure water instantly, taking it to the batteries that need it, wherever they are.

SPECIFICATIONS

- Maximum capacity: 60L
- Height: 1.000 mm
- Width: 350 mm
- Output hose length: 3 m
- Water pressure: 14,5 psi / 1 bar
- Wheel size: 150 mm
- Shipping weight: 8 kg
- Max weight: 72,7 kg
- Controls: single button and 16 x 2 line OLED display

BENEFITS

- Easy to use
- Robust
- Transport water easily
- No assembly required

FILLING PUMP



▶ BAT/34880

Mobile filling system 60 litres (Battery 12V 6.5Ah + battery charger - water pump (ca. 17L/min, 1,9 bar) - 3 meter tube - 1 linking set for the fast filling system - 1 filling gun with automatic switch off.

▶ BAT/21534

water pump

DRAIN PUMPS



▶ BAT/34894

Manual system to drain battery cases. Acid proof synthetic, content: 6 litres, PVC suction tube 6 mm diam.



▶ BAT/34890

Electric pump with 12V battery included to drain superfluous water out of the container. Pipe to put between the cells: Ø 6 mm
Water bottle 60 litres
Capacity pump: 2,7L/min.
12V battery + charger included.

Accessories

FILLING PUMPS & GUNS



▶ **BAT/15145**

20 litres tank, 3m tube, filter, flow indicator and link.

▶ **BAT/28944**

20 Litres tank, 3m tube, Flow-indicator (BAT/12420), fast connector (BAT/15229) + filling gun (BAT/29133) with fast connector (BAT/16298), makes it possible to fill with automatic filling plugs or with water gun.



▶ **BAT/15144**

60 litres tank, 3m tube, filter, flow indicator and link.

▶ **BAT/17594**

60 Litres tank, 3m tube, Flow-indicator (BAT/12420), fast connector (BAT/15229) + filling gun (BAT/29133) with fast connector (BAT/16298), makes it possible to fill with automatic filling plugs or with water gun.



▶ **BAT/12419**

Water tank 20L with tap
X x Y x H: 353 x 165 x 446 mm



▶ **BAT/15832**

Water tank 60L with tap
X x Y x H: 460 x 350 x 500 mm



▶ **BAT/39588**

Tap for water tank 60L

AUTOMATIC WATERVALVE



▶ **BAT/48449**

Automatic Watervalve (220V)
Works on every charger.
The valve is connected by the charger which gives the "end of charge" signal and opens the valve for an xx adjustable time.

WATER BOX



◀ **BAT/17586**

Water bottle with demineralised water - 30L

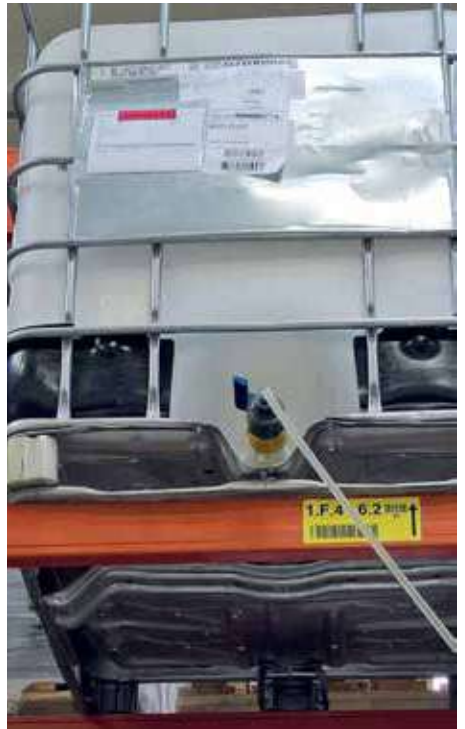


▶ **BAT/35007**

Water tank 1000L with tap - filled with demineralised water.

▶ **BAT/28837**

Water tank 1000L with tap -empty.



BAT/50212

Connector Ø 10 to fix the accessories

Accessories :

BAT/16286 PVC filling tube Ø 10

BAT/12420 Flow indicator

BAT/15229 link female (to fill the batteries with automatic filling system)

BAT/29133 filling gun – not acid proof (to fill the batteries without automatic filling system)



▶ **BAT/29133**

Solid water filling gun with ergonomic rubber handles - 25 cm



▶ **BAT/49468 - S-Type**

Watering gun for stationary battery applications.



▶ **BAT/49469 - RR-Type**

Watering gun for railroad battery applications.



▶ **BAT/46019 - X-Type**

Battery watering gun. This watering gun is popular for its reliable automatic shutoff and its ability to water batteries.

NOTE: for best results, remove baskets in flip top vent plugs. They are not required with automatic pistols.

Accessories

DEMINERALISATION

WATER DEIONIZER SYSTEM

MAXIMIZE BATTERY PERFORMANCE WITH PURE WATER FROM THE TAP

Hard water in your water supply may be causing poor battery performance. Metallic impurities in water can affect cell voltages and increase self discharge.

FEATURES

- Easy to use
- High capacity
- Exclusive battery-operated purity light
- Easy installation
- Pressure system



▶ **BAT/48176**
Replacemant cartridge



▶ **BAT/48174**
Deionizer single

▶ **BAT/48175**
Deionizer double

	Purity of Incoming Tap Water		Output of a single Deionizer Cartridge
	TDS (PPM)	Conductivity (µS/cm)	Liters
Good	20	30.0	13.627
	50	75.0	5.451
	75	112.5	3.634
Average	100	150.0	2.725
	125	187.5	2.180
	150	225.0	1.817
Poor	200	300.0	1.363
	250	375.0	1.090
	300	450.0	908

SPECIFICATIONS

- Flow rate: 2,0 lmp (with provided restrictor)
- Purity Light Power Source (included) : 2 D-Cell Batteries
- Life Estimate: 2 Years
- Purity Light Setting: 50 ppm total dissolved solids
- Dimensions: Mounting plate: 1115mm x 155mm
Disposable Cartridge: 690mm x 123mm
- Hose Dimensions: 9.5mm x 3m (input)
9.5mm x 6m (output)



- ▶ **BAT/15179 : ± 1.000 L**
- ▶ **BAT/15180 : ± 2.000 L**
- ▶ **BAT/15181 : ± 3.000 L**

Demineralisation systems movable or for fixing to the wall equipped with warning systems to replace the resins. The replacement of the resins is very simple.



- ▶ **BAT/49859 = syst. BAT 15175**
- ▶ **BAT/15183 = syst. BAT 15179**
Replace unit of the resins.

Accessories

CLEANING



AQ STEAMER

Cleans your traction batteries in a nature-friendly way: without sewage water!

The most important mark of the steaming technique is the very low water use (ca. 2 litres/hour). That's why it's extremely appropriate to clean traction batteries. A small amount of cleaner can be adjusted to the steam, so it will clean, degrease and neutralize the battery acid.

ADVANTAGES

- Environment-friendly: no polluted sewage water or cleaning cloths
- Battery can stay into the fork-lift truck
- Time-saving: battery cases don't need to be drained
- Money-saving: prolongs the life span of your battery -> prevents leakage currents
- Protected against overpressure, overheating, low water indications etc.



AQ-STEAM BASIC

◀ [BAT/22467](#)

Technical Data			
Voltage	230 V	Warm up time	10 min.
Wattage	3400 W	Water tank	5 L
Pressure	6,5 Bar	Steam Regulator	yes
Stainless Steel Boiler (content)	1 L	Chemical tank	2 L
Material elements	Stainless steel / Inox	Boiler Warranty	1 year
Number of elements	1	Machine Warranty	1 year
Max. Boiler temp.	160 °C	Machine Weight	24 kg
Retiring temp.	130 °C	Vacuum/Water Piston	now
Water consumption	2 - 2,5 L/hour	Size	60x55x33 cm

Accessories

BATTERY TRANSPORT

BATTERY CHANGING BEAMS

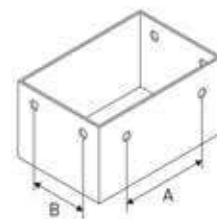


◀ BAT/50999

Lifting beams are specifically designed to remove and replace forklift truck batteries safely and economically without the risk of damage. Supplied complete with 4 swivel hooks. Secured safely to the forks by thumb screws.

Technical specifications:

- Maximum fork section: 150 x 70 mm
- A: min 590 mm - max 1010 mm
- B: min 180 mm - max 900 mm
- Capacity: 2000 kg
- Fully tested and **CE** certified
- Weight: 50 kg
- Delivered with 4 hooks



BATTERY MOVER ASSEMBLY



◀ BAT/50926

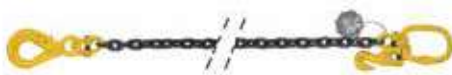
Complete kit



▲ BAT/50928

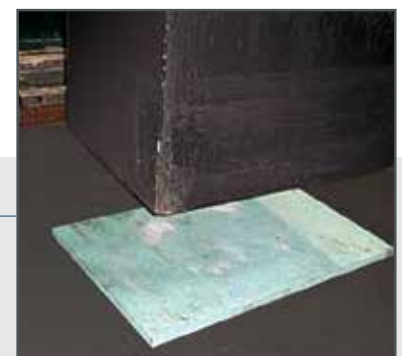
Lower chains, with YELLOW hooks

- To remove traction batteries from forklifts
- Capacity: 2000 kg
- Length: 1050 mm



▲ BAT/50927

Upper chains, with RED hook



▶ BAT/28351

Cover mat - soft finish.
120 x 100 x 2 cm



▶ BAT ref. on demand

Rollerbed on cart



▶ BAT ref. on demand

Rollerbed handpallet truck



▶ BAT ref. on demand

THE MODULAR RACK SYSTEM

THE MOST FLEXIBLE BATTERY STORAGE SYSTEM AVAILABLE TODAY

The modular rack system has been designed with flexibility in mind. No matter what changes need to be made to the battery room, before, during or after the installation, this system will be able to be reconfigured quickly and easily to meet the demand.

By allowing this flexibility the modular rack system greatly reduces the cost of restructuring the battery room. Easy to change the configuration on site at a fraction of the cost of a new installation and frees up valuable space.



THE NEW MODULAR RACK SYSTEM

Our modular rack system is the new, modern and flexible way to store batteries whilst they are being charged.

- It holds up to 20% more batteries freeing up valuable warehouse space.
- 100% acid resistant, dent and rust proof components.
- Colour co-ordinated with integrated battery dividers ensuring battery are arranged neatly in their own space.

If your needs change, it can easily change too.

The ability to change quickly and with minimal disruption makes it one of the most cost effective racking system available in the industry today.

WHAT IT'S MADE OF

The modular rack system is an award winning battery racking system. A set of components that can be bolted together on site to match the needs of a customer.

- Heavy duty, acid resistant perimeter frame.
- Acid and rust resistant roller beams powder coated to your colour specifications.
- Low energy, acid resistant polymer wheels.
- Easily adjustable battery stops.
- Single bolt construction.
- Supports up to 1500kg batteries.

All of our components have been rigorously tested to make sure we're using the best and most durable materials.

Not only will this ensure the durability of the modular rack system, when the time comes to reconfigure, it will look as if it's a new installation

Custom branded roller beams

Adjustable battery side stops



Modular perimeter frames

Quick & simple installation

Accessories

BATTERY TRANSPORT

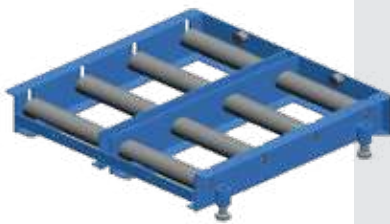
ROLLERBEDS FOR BATTERIES

FIXED ADJUSTABLE TABLE WITH SINGLE COMPARTMENT



Max. dimensions battery box / Overall (mm)		Width					
		300 / 394	400 / 494	500 / 594	600 / 694	700 / 794	800 / 894
Length	865 / 914	TRS 300-4R	TRS 400-4R	TRS 500-4R	TRS 600-4R	TRS 700-4R	TRS 800-4R
	1065 / 1114	TRS 300-5R	TRS 400-5R	TRS 500-5R	TRS 600-5R	TRS 700-5R	TRS 800-5R
	1265 / 1314	TRS 300-6R	TRS 400-6R	TRS 500-6R	TRS 600-6R	TRS 700-6R	TRS 800-6R

FIXED ADJUSTABLE TABLE WITH DOUBLE COMPARTMENT



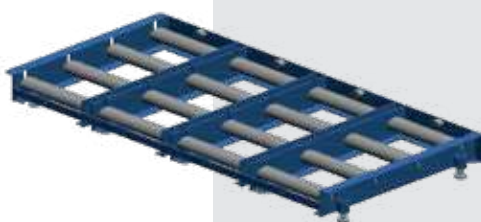
Max. dimensions battery box / Overall (mm)		Width					
		300 / 752	400 / 952	500 / 1152	600 / 1352	700 / 1552	800 / 1752
Length	865 / 914	TRD 300-4R	TRD 400-4R	TRD 500-4R	TRD 600-4R	TRD 700-4R	TRD 800-4R
	1065 / 1114	TRD 300-5R	TRD 400-5R	TRD 500-5R	TRD 600-5R	TRD 700-5R	TRD 800-5R
	1265 / 1314	TRD 300-6R	TRD 400-6R	TRD 500-6R	TRD 600-6R	TRD 700-6R	TRD 800-6R

FIXED ADJUSTABLE TABLE WITH TRIPLE COMPARTMENT



Max. dimensions battery box / Overall (mm)		Width			
		300 / 110	400 / 1410	500 / 1710	600 / 2010
Length	865 / 914	TRT 300-4R	TRT 400-4R	TRT 500-4R	TRT 600-4R
	1065 / 1114	TRT 300-5R	TRT 400-5R	TRT 500-5R	TRT 600-5R
	1265 / 1314	TRT 300-6R	TRT 400-6R	TRT 500-6R	TRT 600-6R

FIXED ADJUSTABLE TABLE WITH QUADRUPLE COMPARTMENT



Max. dimensions battery box / Overall (mm)		Width	
		300 / 1468	400 / 1868
Length	865 / 914	TRQ 300-4R	TRQ 400-4R
	1065 / 1114	TRQ 300-5R	TRQ 400-5R
	1265 / 1314	TRQ 300-6R	TRQ 400-6R

► Height of rollerbeds:

P1 = 111/171 | P2 = 180/241 | P3 = 246/305 | P4 = 320/370
(height: floor/bottom rollers)

THE ACCESSORIES FOR ROLLERBEDS

Charger support table, socket support structure, protective bumper,... can be chosen based on the type of table & width of compartment.

type of table	width of compartment					
	300	400	500	600	700	800
TRS	300	400	500	600	700	800
TRD	300	400	500	600	700	800
TRT	300	400	500	600	700	800
TRQ	300	400	500	600	700	800

▶ Socket support structure



▶ Structure for charger on roller table



▶ Charger support table



▶ Protective bumper 80 x 120 cm



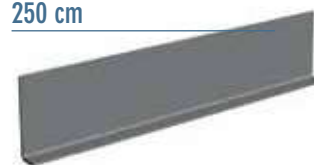
▶ Adjustable stopper for back side

Type B1: length 140

Type B2: length 250



▶ Protective bumper 80 x 250 cm



TRANSPORT TABLE FOR PALLET TRUCK

TYPE	Overall dimensions	Interior useful dimensions
TR 1244	1164 x 600 x 640	1069 x 470
TR 1242	1395 x 600 x 640	1300 x 470
TR 1251	1395 x 780 x 640	1300 x 650



Accessories

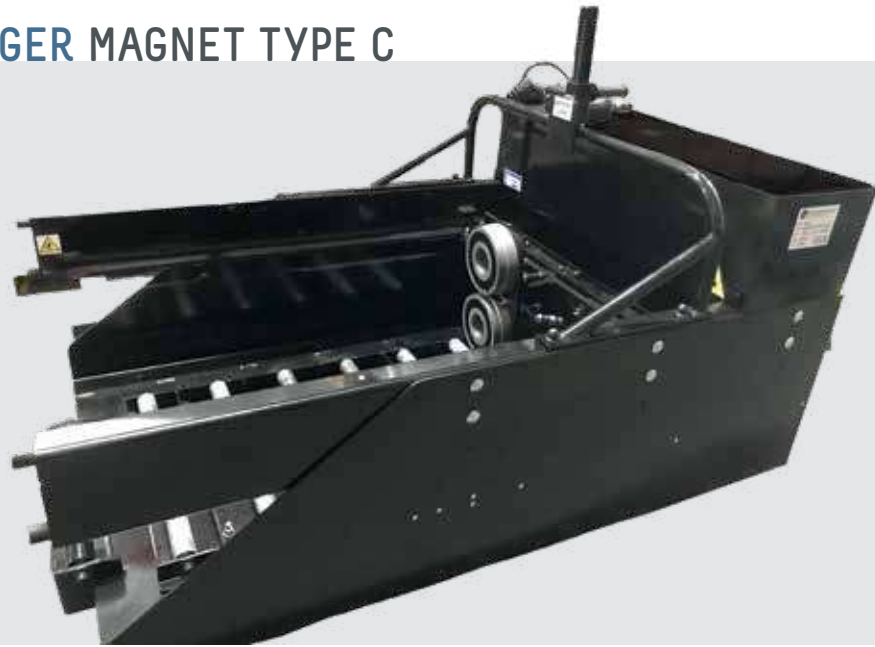
BATTERY HANDLING

Our innovative range of battery handling equipment will efficiently and safely change and store batteries, making more efficient use of space and reducing wastage through damage. Designed and built to drastically reduce changeover times, increasing truck productivity. From single spare battery racks to our fully automated multi-level system, we offer products to match any application.

BATTERY CHANGER MAGNET TYPE G + MODULAR RACK SYSTEM



BATTERY CHANGER MAGNET TYPE C



BATTERY CHANGER MANUAL CART TYPE D



BATTERY CHANGER CRANE TYPE E



BATTERY CHANGER CRANE TYPE F



BATTERY CHANGER CRANE TYPE G



BATTERY CHANGER CRANE TYPE H



Accessories

SAFETY



▶ **BAT/15212**

First aid box (eye care): eye wash, fluid, compress, scissors, paper tissues, sticking plasters and gauze.



▶ **BAT/15165 : size 10**

Acid proof rubber gloves.



▶ **BAT/17096**

Facial screen with swing-back of anti-condensation glass - 180 x 290 mm - 180g.



▶ **BAT/15201**

Safety shower and eye wash station.



▶ **BAT/15172**

Acid proof rubber apron.



▶ **BAT/15159**

Acid proof safety glasses.



▶ **BAT/15204**

Neutralizer, absorber and fire-extinguisher with color indicator. Neutralizes for example acids. When Neutracid colors yellow, the acid is neutralised. 5Kg.

HYDROGEN GAS DETECTOR

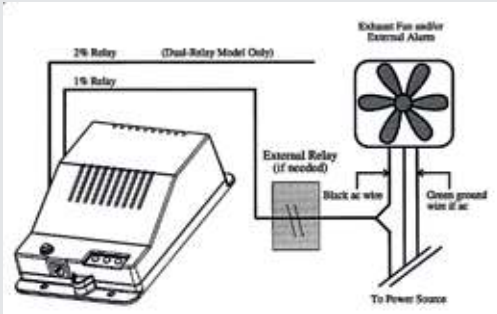
Hydrogen gas detectors (HGD) protect battery charging rooms and other locations where motive and stationary batteries are present by continuously monitoring hydrogen gas levels. The HGD is equipped with LED lights and an 80 dB alarm. AC- or DC-Powered models are available with dual relay. Improving Safety in the Battery Room with Hydrogen Gas Detectors.

The HGD is designed for easy integration into your operation's ventilation system. It is available with a single or dual relay, in AC-or DC-powered models. Relays automatically the venting action of the Hydrogen Exhaust Fan Kit or other peripheral technologies, translating alarms directly into coordinated preventative response.



Control box

- ▶ **BAT/48251**
Detector Hydrogen Exhaust Dual Relay
- ▶ **BAT/48268**
Detector Hydrogen Exhaust Dual Relay DC
- ▶ **BAT/48252**
Additional Remote Display with Buzzer HGD
- ▶ **BAT/48253**
Cable Modular 25' HGD



	Relay	Relay rating	Power requirements	Dimensions	Mounting	Operating temperature
BAT/48251	Dual, Dry Contact Relay	10 A	85 V ac to 265 V ac 50/60 Hz	63,5 x 120,7 x 178 mm	4 x 4,8 mm screws	-10°C tot 40°C
BAT/48268			17 V dc to 60 V dc			

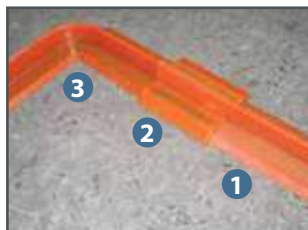


▶ BAT/35779

Seal - drain closer

It is available in 4 sizes. It closes drains and prevents the running off of spilled fluids. Made of flexible PVC that resists water, oil and most of the chemicals. Easy to clean with water and soap, reusable and so economical.

REF	Dimensions
BAT/35779	46 x 46 cm
BAT/35781	61 x 61 cm
BAT/35783	92 x 92 cm
BAT/35785	107 x 107 cm



▶ Retention barrier

The permanent solution

The permanently fixed liquid barriers prevent that fluids or rainwater make an ice rink of your floor, or that harmful substances fall onto the ground. The barriers can be provided at every opening (gates and doors) to collect possible water. The barrier is made of a perforated, preformed steel plate, which is airtight wrapped with very high chemical durable polyurethane.

The barrier, which can be fixed at a flat and pure base, is furthermore supple, so cars, fork-lift trucks and every other rolling material can drive without problems over it.

Color: orange (± RAL 2010) - signalisation color

REF	Dimensions	Description	Photo
BAT/40507	3000 x 105 x 52 mm	Barrier element	1
BAT/40509	150 x 125 x 55 mm	Connector	2
BAT/40511	370 x 105 x 52 mm	Corner	3



	DESCRIPTION	PVC PANEL	sticker
	EMERGENCY SHOWER		
	(100 X 100)	BAT/18845	BAT/18849
	(200 X 200)	BAT/18847	BAT/17507
	SMOKING BAN		
	diam. 90	BAT/17301	BAT/18854
	diam. 200	BAT/17302	BAT/17508
	FIRE BAN		
	diam. 90	BAT/18857	BAT/18859
	diam. 200	BAT/18861	BAT/17508
	ELECTRIC		
	diam. 90	BAT/18863	BAT/18865
	diam. 200	BAT/18867	BAT/17510
	EXPLOSIVES		
	diam.90	BAT/18870	BAT/18872
	diam. 200	BAT/18874	BAT/17511
	CAUSTICS		
	diam. 90	BAT/18877	BAT/18879
	diam. 200	BAT/18881	BAT/17512
* Others on demand			

Maintenance services

ELECTRIC SYSTEM DESIGN



WE CAN OFFER ELECTRIC SYSTEM DESIGN FOR

- AC induction motors & controllers
- PMAC motors & controllers
- DC motors & controllers
- Graphic displays
- Industrial remote controls
- Batteries and chargers (Battery Supplies)
- Wire harness design & manufacturing
- High current solenoids & contactors
- Custom controller software



WHY CHOOSE TVH AS YOUR PARTNER FOR ELECTRIC SYSTEM DESIGN?

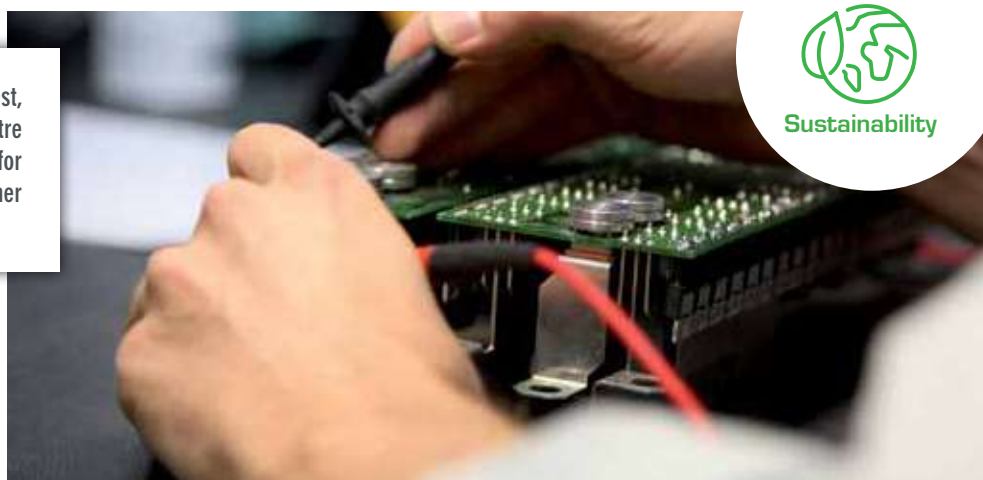
- Complete custom-made solutions
- Strong technical know-how and experience
- Technical support and helpdesk
- Extended range
- After-sales service thanks to our big stock and one-stop shop
- After-sales repair service

WE BUY YOUR OLD PARTS

Do you have old parts lying around? If they're repairable, we're interested in buying them. To get the ball rolling, fill out the 'Core purchase' form at www.tvh.com/corepurchase and email it to cores.electronics@tvh.com.

REPAIRCENTER FOR ALL BRANDS OF CHARGERS

Our electronics department is Europe's largest, best-equipped and most diverse service centre for the repair of electronic components for forklifts, aerial work platforms and other industrial vehicles.



BATTERY CHARGERS

All types of chargers - including high-frequency chargers - are repaired in our workshop and then tested on a dedicated power test bench. The tester is capable of simulating any type of battery, regardless of voltage or amperage. Internally developed software allows us to print the charging curve.

MAINTENANCE TECHNICIANS

We have our own service department for repairing and maintaining (traction) batteries and industrial chargers. We can perform capacity tests on batteries, regenerate them, and much more. We can do these services at Battery Supplies in the workshop or with the customer on site. The electronic department specializes in repairing all types of chargers: traditional or high-frequency chargers. Our technicians are ready for you!

- A well-maintained battery has a longer lifespan.
- It is time-saving for you.
- An improperly maintained battery can lead to very dangerous situations.
- Defects and / or problems are detected faster.
- A well-maintained battery has a lower TCO (Total cost of ownership).



SCRAP LEAD

WE ALSO COLLECT YOUR SCRAP LEAD



QUALITY CONTROL



At our service center Quality Control, defective and poorly performing batteries are investigated and solutions are found by repairing or replacing them. A common problem with traction batteries are "accidents" with a too low electrolyte level or sulfation. In these cases, the batteries can usually be returned to workable state by charging / discharging techniques or by adding battery acid.

Batteries can also be fully tested and measured, this is very useful for warranty claims that may come in. All batteries from 2 volts to 120 volts can be measured and receive a corresponding test report.

The services of testing, replacement and repair of chargers and boosters is also a part of the Quality Control service.

Given the high technological expertise of our employees in Quality Control also courses can be followed here. In case of special projects of our customers, QC also often visits on-site at the customer.

Forms

BATTERY REQUEST FORM

Link to online form:



COMPANY/CUSTOMER NUMBER VAT number

TYPE TRACTION BATTERY WITH CONTAINER TRACTION CELLS

TECHNOLOGY Lead-acid Pure Lead Carbon Square Ex-proof (ATEX)
 Gel Lithium-Ion CSM Low maintenance

CELLCODE

VOLTAGE V

CAPACITY Ah / 5h

Dimensions container

X cm
 Y cm
 H cm

Dimensions cell

X cm
 Y cm
 H cm

BRAND MACHINE **MODEL MACHINE**

BATTERY PLUG HANDLE PLASTIC
 TYPE HANDLE METAL
 COLOR AUXILIARY CONTACTS

OPTIONS AUTOMATIC FILLING SYSTEM TANK 20 L BLINKI
 ACID CIRCULATION TANK 60 L DATALOGGER
 TANK 1000 L

BATTERY CHARGER CLASSIC CHARGER
 BRAND VOLTAGE V HIGH FREQUENCY CHARGER
 TYPE AMP A CHARGE TIME
 12h
 8h

RECUPERATION (old battery)

NOTES

PLEASE ENCLOSE PHOTOS

Link to online form:



LI-ION BATTERY REQUEST FORM

PROJECT IDENTIFICATION

PROJECT NAME INTERNAL NUMBER OF PROJECT

DATE CUSTOMER VAT number

CONTACT CONTACT BATTERY SUPPLIES

BASIC PRODUCT CONFIGURATION

APPLICATION

TECHNOLOGY LFP NMC

VOLTAGE V

CAPACITY AH AT 100% DOD

WH AT 100% DOD

WEIGHT KG (MIN) KG (MAX)

Dimensions container



X mm

Y mm

H mm

MIN EXPECTED CYCLES # AT DOD 100%

AT DOD 80%

DISCHARGE

NOM CURRENT A

OR C

MAX CURRENT A DURING SEC

OR C

MOTOR W

TEMPERATURE RANGE °C (MIN) °C (MAX)

CHARGE

CURRENT A

DURATION H

EXISTING CHARGER NO

YES, TYPE OF CHARGER AND CHARGE PROFILE:

.....

IN CASE OF NEW CHARGER MONO

3PHASE

TEMPERATURE RANGE °C (MIN) °C (MAX)

CONTROL

DISPLAY YES NO

COMMUNICATION CAN OTHER

MARKET

	YEAR	VOLUME
EXPECTED ANNUAL VOLUME	<input type="text"/>	<input type="text"/>
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NOTES

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KEEPS YOU GOING

TVH is your global one-stop shop for parts and accessories for material handling, industrial, construction and agricultural equipment. At TVH, we offer every type of battery you can think of, from classic alkaline AA batteries to starter batteries. If we don't have the battery you need in stock, we will guide you to a compatible alternative, for both thermal and electrical machines.

Our commitment to first-class service and our in-depth knowledge makes TVH the reliable supplier you need for batteries. We offer:

- Over 50 years of technical expertise in material handling equipment.
- 95% same-day shipment, next-day delivery to all our customers.
- Customer support in 55 languages.



DISCOVER THE RANGE OF BATTERIES AT TVH



HOUSEHOLD BATTERIES

Household batteries, or general-purpose batteries, give power to small, electronic devices, as well as power tools, drills, portable lights and more.



STARTER BATTERIES

Starter batteries are used to start vehicles like cars, trucks and tractors, along with industrial machines such as forklifts, reach trucks and stackers. Starter batteries have more starting power than other batteries. Therefore, they're only used occasionally to deliver a very large amount of power.

Looking for a new starter battery? Always check the voltage (V), current (Ah) and dimensions of your current battery to find the perfect match for your machine!

You can also contact our experts to assist you in your search. TVH partners with Varta, Xtreme Exellent, Optima and Odyssey to give you the best quality starter batteries for you.



CYCLIC BATTERIES

Cyclic batteries can withstand many deep discharges. This makes these batteries perfect for mobile elevating work platforms, industrial cleaning machines, forklifts, golf carts and other electric powered vehicles ... Within this battery category, we distinguish open lead-acid and maintenance-free batteries. There are seven types of cyclic batteries: AGM, semi-traction, GEL, pure lead, lead carbon, monobloc traction and deep-cycle batteries.



LITHIUM BATTERIES

Lithium technology has gone through significant developments in the last five years. As a result, the demand for replacing conventional lead-acid batteries with high-performing Li-ion technology has rapidly increased.

Unlike with lead-acid batteries, boosting charges do not have a negative effect on the service life of lithium-ion batteries. Combined with quicker charging and a greater depth of discharge, this means that industrial-vehicle operators are no longer limited by restrictive charging regulations or the need to swap batteries. Lithium-ion batteries also require less maintenance than lead-acid batteries. They're the batteries of the future!



STATIONARY BATTERIES

Stationary batteries are made for stand-by or stationary applications. They are used as a back-up battery when there is a power outage. There are many applications that are too important and cannot go without power, think of hospitals, alarm systems, servers, communication systems ...

Our range of stationary batteries includes AGM VRLA, GEL, Pure Lead and OPzV & OPzS stationary batteries. All stationary batteries are maintenance-free, so you don't have to worry about battery maintenance.



THE BENEFITS OF TVH AS YOUR BATTERY DISTRIBUTOR

TVH offers a wide range of brands, allowing customers to choose the batteries they prefer. Many customers opt for a brand they already trust, often because it was originally built into their machine, or because they are satisfied with the performance of previous batteries from that brand. There are also customers who don't have a preferred brand. Don't worry if that's you, we are more than happy to guide you to the right battery for your application. One thing is sure, our range consists exclusively of top brands.

BUY YOUR BATTERIES ONLINE

When the machine breaks down, the last thing you need are complicated processes and delayed shipments. That's why we've made getting new batteries from TVH easier than ever for you.

Your TVH account lets you explore over 44 million parts and consumables. You'll also be able to:

- Order your batteries directly from TVH through your own software.
- Save research time and reduce search errors by registering your machine in our webshop. You can personalise your equipment by adding your own reference, images, documents and notes.

- Find the correct references or names of the parts you need with the search functions MyPartsFinder and MyProductSearch, using the technical specifications of the part or via the equipment make and type.
- Immediately see the price, lead time, availability, pictures and technical features for every reference.

Request your login details via mytotalsource.tvh.com or find out more information on www.tvh.com.



GLOBAL SUPPORT TEAM

With 62 different nationalities and 55 spoken languages in the company, we can offer customer support in your own language.



OVER 50 YEARS OF EXPERIENCE

We've grown from 2 founders to a company of more than 5000 employees, with offices and distribution facilities on every continent.



46 000 000 KNOWN REFERENCES

The most extensive range of parts for material handling, industrial, construction and agricultural equipment. We continuously grow our offer, with more parts and accessories arriving every day.



95% SHIP THE SAME DAY

We collaborate with local shipping companies to deliver every order within the promised timeframe. To ensure a fast delivery, we ship 95% of orders on the same day of ordering.



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We reserve the right to make changes in availability as well as technical changes without prior notice.