

Motive Power (Traction) Batteries & Cells



 **SUNLIGHT**
creating energy



Our state-of-the-art production facilities

Motive Power Batteries

Introduction

SUNLIGHT motive power (traction) batteries provide a high level of power and reliability for all industrial truck applications. The extended range of both DIN and BS cells covers all types of applications, from low capacity up to heavy duty multi shift operations.

SUNLIGHT traction batteries provide a high efficiency during the discharge period of the battery, an efficiency which is achieved by the use of advanced components in the manufacturing process of the plates. The design of the positive and negative plates has been optimized to gain more energy in the cells. All these technical improvements have enabled high capacities in the given external dimensions of the cells.

Benefits

- Available in both DIN and BS ranges
- Optimized design to achieve high capacities
- Long life service
- Readily available
- Low maintenance requirements

Technical Features

- Optimized plate design delivers capacities exceeding nominal values of international standards
- 100% initial capacity from the first cycle
- Fully insulated terminals and connectors
- Long cycle life
- High energy density
- Robust, durable cell construction
- Improved voltage stability and discharge performance

Applications

- **Light-duty applications**
Single shift operation with light usage of the battery and discharge lower than 60% of C_5 . Electrolyte at about 30°C.
- **Normal-duty applications**
Single shift operation with discharge up to 80% of C_5 . Electrolyte at 30°C.
- **Heavy-duty applications**
Single shift operation with discharges of 80% of C_5 and high discharge currents. Boost charging to increase the availability of the battery. Multi shift operation with or without battery charges in intervals, in between operation. High ambient temperature.



Motive Power Batteries Construction

Plates

Positive tubular plates are constructed with lead-antimony alloy so as to optimize cycle life with the lowest water consumption possible. Negative grid plates are designed with pasted lead grid in order to provide a high spongy level and reduce capacity loss. Microporous separators are designed to have a high porosity grade so as to ensure better ionic circulation and low internal resistance. Boxes and lids are impact resistant and made of polypropylene (PP) and are thermowelded to prevent electrolyte leakage.

Terminals

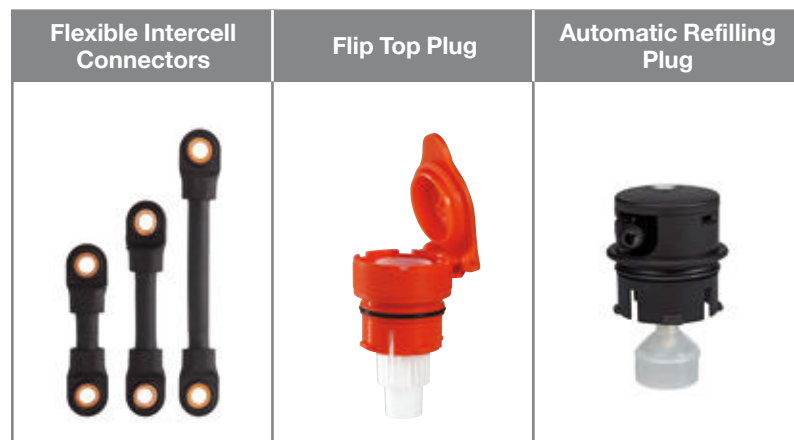
Terminals are designed to prevent electrolyte leakage and the subsequent damage to the copper connectors. Bolt-on type terminals allow cells to be replaced or moved without excessive labor.

Plugs

- Flip top plugs, with electrolyte basket level marking, are fitted on the cells. These plugs allow the escape of gases during the charging process of the battery, and also provide a safe anti-surge baffle for the electrolyte during operation.
- The automatic filling system vent plug automatically ensures the optimum filling level of the cells, minimizing the required maintenance time for the battery thus the required excessive labor cost.

Connectors

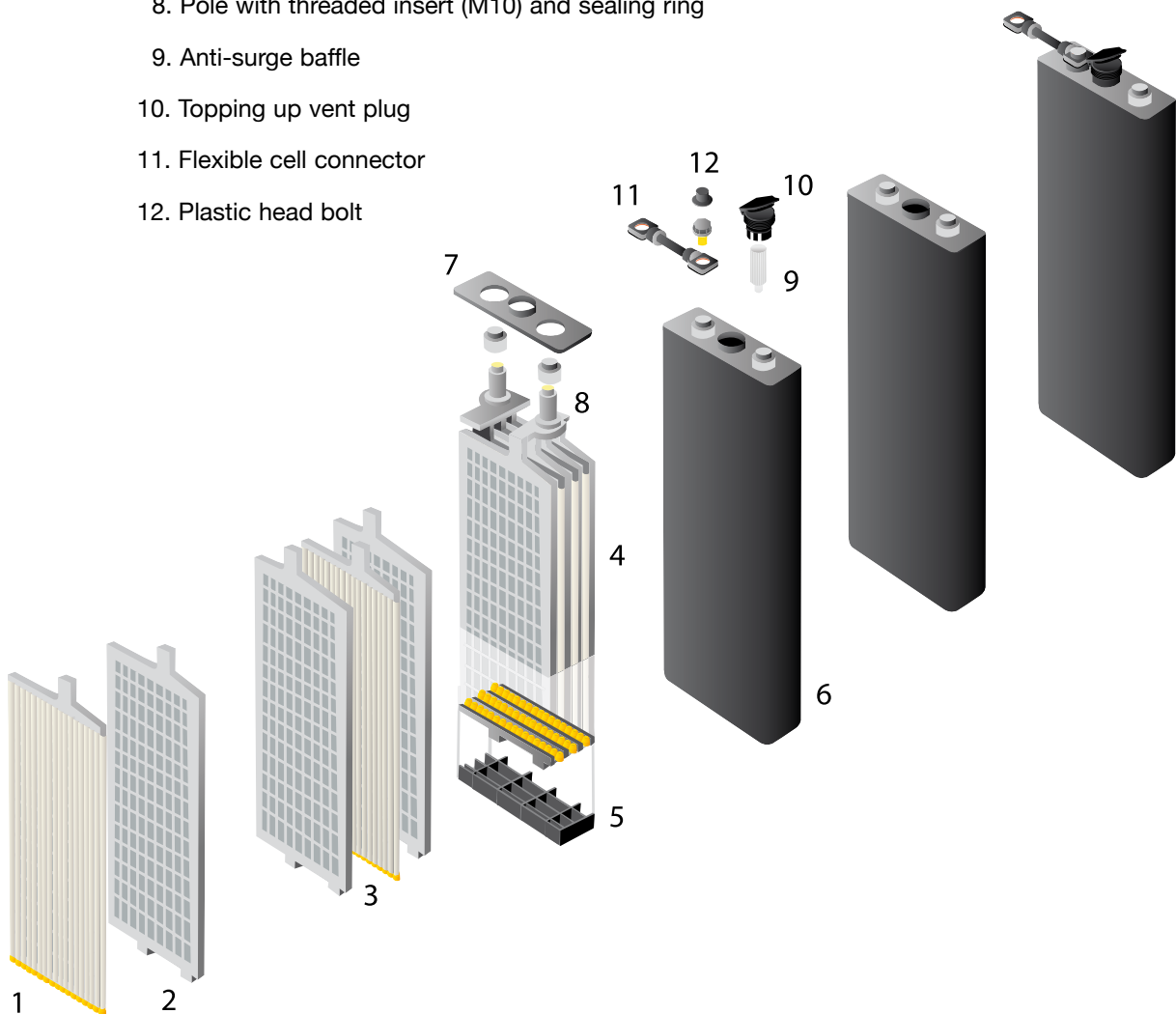
The cells inside a SUNLIGHT battery are connected with the use of fully insulated flexible copper connectors. The use of the bolt-on connector design allows the user of the battery to replace or move the cells easily without excessive labor thus extra cost.



Motive Power Batteries

Mechanical Construction

1. Positive plate
2. Negative plate
3. Plate set
4. Plate set assembly with terminal bridge and screw terminal (M10)
5. Sediment spacer
6. Cell container
7. Cell lid
8. Pole with threaded insert (M10) and sealing ring
9. Anti-surge baffle
10. Topping up vent plug
11. Flexible cell connector
12. Plastic head bolt



DIN Product Range

Plate Type	Type Designation	Nominal Capacity Ah (C ₅)*	max. cell dimensions in mm*			Weight in kg**
			a	b	h	
			0 -2mm	0 -2mm	0 -2mm	
60 Ah	2 PzS 120	120	47	198	370	8.3
	3 PzS 180	180	65	198	370	11.7
	4 PzS 240	240	83	198	370	15.2
	5 PzS 300	300	101	198	370	18.8
	6 PzS 360	360	119	198	370	22.4
	7 PzS 420	420	137	198	370	26.0
	8 PzS 480	480	155	198	370	29.6
	9 PzS 540	540	174	198	370	33.2
	10 PzS 600	600	192	198	370	36.8
80 Ah	2 PzS 160	160	47	198	435	9.7
	3 PzS 240	240	65	198	435	13.8
	4 PzS 320	320	83	198	435	18.0
	5 PzS 400	400	101	198	435	22.2
	6 PzS 480	480	119	198	435	26.4
	7 PzS 560	560	137	198	435	30.6
	8 PzS 640	640	155	198	435	34.9
	9 PzS 720	720	174	198	435	39.2
	10 PzS 800	800	192	198	435	43.5
90 Ah	2 PzS 180	180	47	198	505	11.9
	3 PzS 270	270	65	198	505	16.7
	4 PzS 360	360	83	198	505	21.3
	5 PzS 450	450	101	198	505	26.0
	6 PzS 540	540	119	198	505	30.7
	7 PzS 630	630	137	198	505	35.4
	8 PzS 720	720	155	198	505	40.1
	9 PzS 810	810	174	198	505	44.8
	10 PzS 900	900	192	198	505	49.6
105 Ah	2 PzS 210	210	47	198	545	12.9
	3 PzS 315	315	65	198	545	18.4
	4 PzS 420	420	83	198	545	23.9
	5 PzS 525	525	101	198	545	29.4
	6 PzS 630	630	119	198	545	35.0
	7 PzS 735	735	137	198	545	40.5
	8 PzS 840	840	155	198	545	46.0
	9 PzS 945	945	174	198	545	51.5
	10 PzS 1050	1050	192	198	545	57.1

* According to IEC 60254- Part 1 & 2, ** Filled and charged cell weights + / - 5%

DIN Product Range

Plate Type	Type Designation	Nominal Capacity Ah (C ₅)*	max. cell dimensions in mm*			Weight in kg**
			a	b	h	
			0 -2mm	0 -2mm	0 -2mm	
115 Ah	2 PzS 230	230	47	198	575	13.4
	3 PzS 345	345	65	198	575	19.2
	4 PzS 460	460	83	198	575	24.9
	5 PzS 575	575	101	198	575	30.7
	6 PzS 690	690	119	198	575	36.4
	7 PzS 805	805	137	198	575	42.1
	8 PzS 920	920	155	198	575	48.0
	9 PzS 1035	1035	174	198	575	53.6
	10 PzS 1150	1150	192	198	575	59.4
	125 Ah	2 PzS 250	250	47	198	595
3 PzS 375		375	65	198	595	20.2
4 PzS 500		500	83	198	595	26.3
5 PzS 625		625	101	198	595	32.5
6 PzS 750		750	119	198	595	38.6
7 PzS 875		875	137	198	595	44.7
8 PzS 1000		1000	155	198	595	50.8
9 PzS 1125		1125	174	198	595	57.0
10 PzS 1250		1250	192	198	595	63.2
140 Ah		2 PzS 280	280	47	198	720
	3 PzS 420	420	65	198	720	26.0
	4 PzS 560	560	83	198	720	33.1
	5 PzS 700	700	101	198	720	40.2
	6 PzS 840	840	119	198	720	47.5
	7 PzS 980	980	137	198	720	54.8
	8 PzS 1120	1120	155	198	720	62.2
	9 PzS 1260	1260	174	198	720	69.8
	10 PzS 1400	1400	192	198	720	77.4
	155 Ah	2 PzS 310	310	47	198	740
3 PzS 465		465	65	198	740	26.5
4 PzS 620		620	83	198	740	33.9
5 PzS 775		775	101	198	740	42.0
6 PzS 930		930	119	198	740	50.0
7 PzS 1085		1085	137	198	740	58.1
8 PzS 1240		1240	155	198	740	66.2
9 PzS 1395		1395	174	198	740	74.4
10 PzS 1550		1550	192	198	740	82.5

* According to IEC 60254- Part 1 & 2, ** Filled and charged cell weights + / - 5%

BS Product Range

Plate Type	Type Designation	Nominal Capacity Ah (C ₅)*	max. cell dimensions in mm*			Weight in kg**
			a	b	h	
			0 -2mm	0 -2mm	0 -2mm	
23 Ah***	2 PzB 46	46	45	158	230	4.1
	3 PzB 69	69	61	158	230	5.6
	4 PzB 92	92	77	158	230	7.0
	5 PzB 115	115	93	158	230	8.5
	6 PzB 138	138	109	158	230	10.0
32 Ah***	2 PzB 64	64	45	158	290	5.4
	3 PzB 96	96	61	158	290	7.3
	4 PzB 128	128	77	158	290	9.2
	5 PzB 160	160	93	158	290	11.3
	6 PzB 192	192	109	158	290	13.2
	7 PzB 224	224	125	158	290	15.2
	8 PzB 256	256	141	158	290	17.2
42 Ah***	2 PzB 84	84	45	158	356	6.9
	3 PzB 126	126	61	158	356	9.4
	4 PzB 168	168	77	158	356	11.9
	5 PzB 210	210	93	158	356	14.5
	6 PzB 252	252	109	158	356	17.1
	7 PzB 294	294	125	158	356	19.7
	8 PzB 336	336	141	158	356	22.2
55 Ah	2 PzB 110	110	45	158	428	8.4
	3 PzB 165	165	61	158	428	11.5
	4 PzB 220	220	77	158	428	14.6
	5 PzB 275	275	93	158	428	17.8
	6 PzB 330	330	109	158	428	20.9
	7 PzB 385	385	125	158	428	24.0
	8 PzB 440	440	141	158	428	27.2
	9 PzB 495	495	157	158	428	30.3
	10 PzB 550	550	173	158	428	33.3
65 Ah	2 PzB 130	130	45	158	484	9.6
	3 PzB 195	195	61	158	484	13.2
	4 PzB 260	260	77	158	484	16.8
	5 PzB 325	325	93	158	484	20.5
	6 PzB 390	390	109	158	484	24.1
	7 PzB 455	455	125	158	484	27.7
	8 PzB 520	520	141	158	484	31.4
	9 PzB 585	585	157	158	484	35.0
	10 PzB 650	650	173	158	484	38.5

* According to IEC 60254- Part 1 & 2, ** Filled and charged cell weights + / - 5% ***Available upon request

BS Product Range

Plate Type	Type Designation	Nominal Capacity Ah (C ₅)*	max. cell dimensions in mm*			Weight in kg**
			a	b	h	
			0 -2mm	0 -2mm	0 -2mm	
75 Ah	2 PzB 150	150	45	158	541	10.9
	3 PzB 225	225	61	158	541	14.9
	4 PzB 300	300	77	158	541	19.0
	5 PzB 375	375	93	158	541	23.1
	6 PzB 450	450	109	158	541	27.3
	7 PzB 525	525	125	158	541	31.4
	8 PzB 600	600	141	158	541	35.6
	9 PzB 675	675	157	158	541	39.5
	10 PzB 750	750	173	158	541	43.7
85 Ah	2 PzB 170	170	45	158	597	12.3
	3 PzB 255	255	61	158	597	17.0
	4 PzB 340	340	77	158	597	21.6
	5 PzB 425	425	93	158	597	26.3
	6 PzB 510	510	109	158	597	30.9
	7 PzB 595	595	125	158	597	35.6
	8 PzB 680	680	141	158	597	40.4
	9 PzB 765	765	157	158	597	44.8
	10 PzB 850	850	173	158	597	49.7
100 Ah	2 PzB 200	200	45	158	633	12.9
	3 PzB 300	300	61	158	633	17.7
	4 PzB 400	400	77	158	633	22.6
	5 PzB 500	500	93	158	633	27.5
	6 PzB 600	600	109	158	633	32.4
	7 PzB 700	700	125	158	633	37.3
	8 PzB 800	800	141	158	633	42.2
	9 PzB 900	900	157	158	633	46.8
105 Ah	2 PzB 210	210	45	158	713	14.8
	3 PzB 315	315	61	158	713	20.4
	4 PzB 420	420	77	158	713	26.1
	5 PzB 525	525	93	158	713	31.7
	6 PzB 630	630	109	158	713	37.3
	7 PzB 735	735	125	158	713	43.0
	8 PzB 840	840	141	158	713	48.7

* According to IEC 60254- Part 1 & 2, ** Filled and charged cell weights + / - 5%

Motive Power Batteries

Optional Equipment

Electrolyte Circulation System (Airlift System)

Electrolyte Circulation System has been developed to extend the autonomy of the electrical vehicles (forklifts etc.) used in installations. Each battery cell can be equipped with an Airlift System. The principle behind it, is that a pump is used to circulate low-level compressed air into the cells and create a homogenous electrolyte mixture throughout them.

Benefits of the Airlift System:

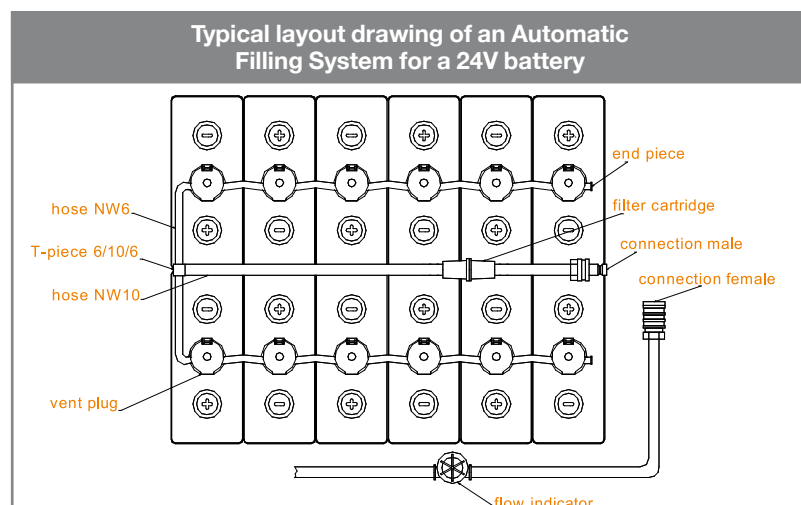
- ✓ Low level temperature
- ✓ Electrolyte stratification is prevented
- ✓ Battery charging is optimized

In more detail:

- The battery can be fully charged in 5 ½ hour's time, without any significant increase of the cell's temperature.
- The stratification of the electrolyte is prevented during the charging process of the battery. A homogeneous density and temperature is achieved throughout the cells, due to the circulation of the electrolyte.
- It is possible to "partially" charge the battery in order to prolong the autonomy of the electrical vehicles.
- The overcharge coefficient is 70% lower.
- The water consumption is reduced by 70%. This extends the battery's maintenance period.
- During the charging process energy consumption is reduced up to 20%.
- A longer cell life cycle is achieved due to the uniform decay of the plates.

Automatic Filling System:

Automatic Filling System (A.F.S.) allows the user to top up the cells of the battery from one central point through an integrated piping system, installed on the battery. The automatic filling plugs ensure the optimum filling level of the cells, minimizing the required maintenance time for the battery.



Chargers for Motive Power Batteries

SUNLIGHT battery chargers are designed to recharge low, medium and high capacity traction batteries (depending on the application). The product range includes single and three phase chargers of thyristor and switch-mode technology.

A wide variety of battery chargers will provide the best solution to any battery recharge need.

Features & Benefits:

- Programmable/Automatic charging profile (depending on the model).
- Available multiple charging profiles for different battery technologies.
- Conformity to EN 61000-6-3: Electromagnetic Compatibility (EMC).
Generic Standards.
Emission standard for residential, commercial and light-Industrial Environments.
- Conformity to EN 61000-6-2: Electromagnetic Compatibility (EMC).
Generic Immunity Standards for Industrial Environments.
- Automatic/Manual Equalization charging.
This ensures battery availability at all times, having the battery always charged and ready for use.
- Fully Automatic Operation: Automatic reset and start-up.
- Charge start delay: Ensures safe connection of the battery.
- LED display: Shows state of charge and fault conditions, with option for remote indication.
- Ease of installation: Plug and appliance socket fitted on all types.
- Fault Protection: from damage due to battery, charger, or operator errors.
- Compact design.
- High Power factor and efficiency.
- Optimal charging factor based on the depth of discharge.
- Memory on last charges (available on specific models).



A wide range of SUNLIGHT Traction battery chargers ensures the correct operation and longer service life of the battery.

- | | |
|--|--|
| <ul style="list-style-type: none"> • Single phase chargers CEMB 30 Series (Wa)
V DC: 12V, 24V, 36V, 48V
A DC: from 20A up to 80A • Single phase chargers ECO Series (Wa)
V DC: 24V, 36V, 48V, 72V, 80V
A DC: from 60A up to 120A • Single phase chargers COMPACT 30 Series (Wa)
V DC: 24V, 36V, 48V, 72V, 80V
A DC: from 40A up to 140A • Three phase chargers COMPACT 30 Series (Wa)
V DC: 24V, 36V, 48V, 72V, 80V, 96V
A DC: from 60A up to 180A | <ul style="list-style-type: none"> • Three phase chargers DIGIT 3001 AIRLIFT Series (Wo-Wa)
V DC: 24V, 36V, 48V, 72V, 80V, 96V
A DC: from 50A up to 300A • Three phase chargers SIRIUS Series (Wo-Wa)
V DC: 24V, 36V, 48V, 72V, 80V, 96V
A DC: from 60A up to 240A • Three phase chargers Eagle High Frequency Series
V DC: 24V, 36V, 48V, 72V, 80V
A DC: from 50A up to 120A • Three phase chargers Sirius Chopper High Frequency Series
V DC: 24V, 48V, 80V
A DC: from 200A up to 500A |
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