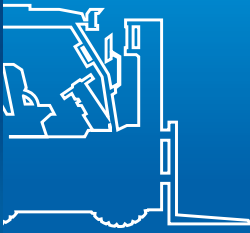




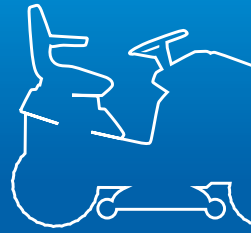
AGVs



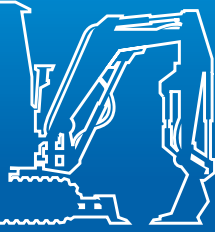
Agricultural  
machinery



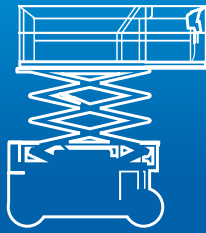
Forklifts



Lawn  
tractors



Working  
platforms



Sweepers

Construc-  
tion  
machinery

Lift trucks



## Lithium energy systems liflex NG

- Higher efficiency
- Longer lifetime with Q-Leveling
- Smart, future-proof and innovative



## Lifetime determines the profitability of the investment

Lithium-ion batteries have been used successfully for many years. Most recently in traction and solar array energy storage applications. Experience in recent years has shown that, in addition to system availability, the service life and the amount of energy that can be extracted during a charge/discharge cycle are critical for the success of the investment.



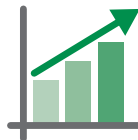
### Requirements for the battery

- Long system service lifetime
- Performance independent of lowest-functioning cell
- Each cell should:
  - operate individually
  - allow capacity measurement
  - be interchangeable
- Availability of all system-relevant information
- Possibility of second-life operation



### Requirements for the energy system

- Charging and battery technology must be coordinated
- The battery management system (BMS) has the task of delaying the aging process therefore maximizing service life
- The system should be scalable (pay as you grow) to limit initial investment for those situations where future sizing and load growth is unknown and not predicable, especially in stationary applications
- On-site module replacement should be possible
- Chargers with CAN communication should be backward compatible to charge existing batteries in the field, as well as latest energy systems



### Requirements for the Energy System Supplier

- One point of contact for the entire project
- Many years of experience in charging and storage technologies
- Delivery of system technology from a single source
  - energy storage system
  - charger
  - software
  - BMS
  - Proactive service
- Design and manufacturing under one roof
  - hardware and software development
  - manufacturing
  - certified quality management



### Goals

- Long service life
- Maximum availability of equipment
- Highest economic efficiency
- High flexibility over the entire service life
- Independence from
  - cell manufacturers
  - cell parameters
- Environmentally friendly and sustainable (refurbishing or recycling)

## Battery and charging technology, part of our DNA for decades

### Expertise for more than half a century

For more than half a century BENNING products have improved the safe and efficient utilisation of energy resources. Smart solutions for the conversion of energy in multi-purpose or storable energy defines the company.

Outstanding expertise in battery and charging technology, combined with knowledge regarding the requirements of the industry have gone into the development of the new lithium technology.

After extensive analysis and development activities, our first lithium battery was successful in field testing in 2008. After completion of all tests and inspections, series production was started at BENNING's factory.

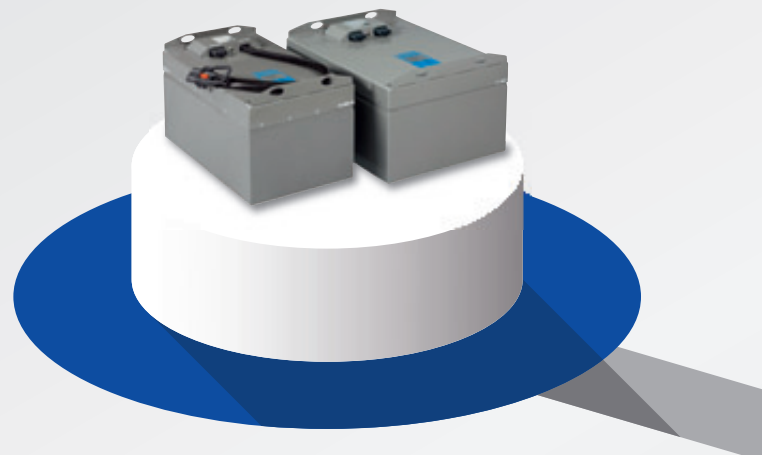
Currently, BENNING is one of the innovation and technology leaders in the field of lithium technology in Europe.

### Everything from a single source: Hardware and software, charger, BMS

Whether hardware, software, BMS or charger, we integrate our lithium charging technology solutions to the customer's unique requirements. We deliver the product and provide service throughout the product life-cycle.

### LIONIC® – Robust and safe

LIONIC®, a robust and safe battery in its third generation, for 24 V to 48 V and a capacity of 96 Ah to 480 Ah.



*BENNING factory II*

## Decades of know-how in:

- Storage technology
- Charging technology
- Development of standard and customized solutions both in the hardware and software area
- A wide range of application possibilities

# Everything from one source: Hardware, software, charger, BMS

## liflex NG – Future-proof system

liflex NG is a modular battery system from 24 V to 96 V. This battery complies with DIN EN 1175 and is therefore future-proof. The system consists of a master module 24 V/140 Ah and depending on voltage and capacity, if necessary, several slave modules of 24 V/140 Ah. The modules can be installed horizontally or vertically. The master module is equipped with a cell module, the relays and the BMS with Q-Leveling.



## BELATRON Li+ charging systems – Efficient and connective

The latest generation of BELATRON Li+ chargers covers the range from 24 V to 96 V as standard. The high efficiency of up to 96 % reduces investment, installation and maintenance costs. The excellent connectivity allows maximum flexibility in control and monitoring.

## Added value with method, now and in the future

- Charging and battery technology are optimally matched and function as a single unit
- liflex NG is
  - durable through Q-Leveling
  - modernly designed
  - high voltage capable
  - designed for industrial, mobile and stationary applications

## Competent and in partnership

- Analysis of the application
- Joint determination of the lithium energy system (project planning of stationary or mobile systems)
- Consideration of purchase or lease
- Delivery of the complete system
- Commissioning
- Technical support during the whole life cycle

# Energy systems liflex NG as an industrial storage unit in mobile use



Fig. 1: liflex NG energy systems 24 V / 3.6 kWh (140 Ah)



## liflex NG energy systems – Charging on site

- No central charging station
- No high infrastructure costs
- No battery replacement
- No outgassing of the battery
- No ventilation and deaeration systems
- No water filling
- No long ways to the charging station

Charging of liflex NG energy systems can take place at decentralized charging stations. Since no gassing occurs during charging, the special regulations for central battery charging stations (e.g. DIN 50272-3, BGHW, ZVEI bulletin) do not apply to the charging of liflex NG energy systems in many respects.

Investments for the installation of these charging stations are considerably reduced, as special ventilation nor acid-proof material for the floor is required.

Shortened travel distances for decentralized charging stations save working time in many cases.



Fig. 2: LIONIC® from 24 V / 96 Ah to 48 V / 480 Ah

Fig. 3: Chargers of the BELATRON Li+ series, 24 V to 96 V

### liflex NG types: Standard and Slim – Flexible installation

The liflex NG series is available in two module types: Standard and Slim. Both module types have the same capacity. The different housing sizes are achieved by different cell arrangement.

The systems/modules can be used both vertically and horizontally. This gives users added flexibility depending on the installation.

#### liflex NG external SoC display

- State of charge as bar graph
- Warning
- Alarm
- Error code
- Alarm horn



### Charger BELATRON Li+ – IP54 and higher

- Start/stop function via battery
- 24 V to 96 V
- Protection class IP54
- Directly accessible off button
- Two side fans
- Optionally with heating



Fig. (right): The ventilation concept of the BELATRON charger is designed for use in dusty environmental conditions

# liflex NG reduces the total cost of ownership (TCO) of your industrial truck operation

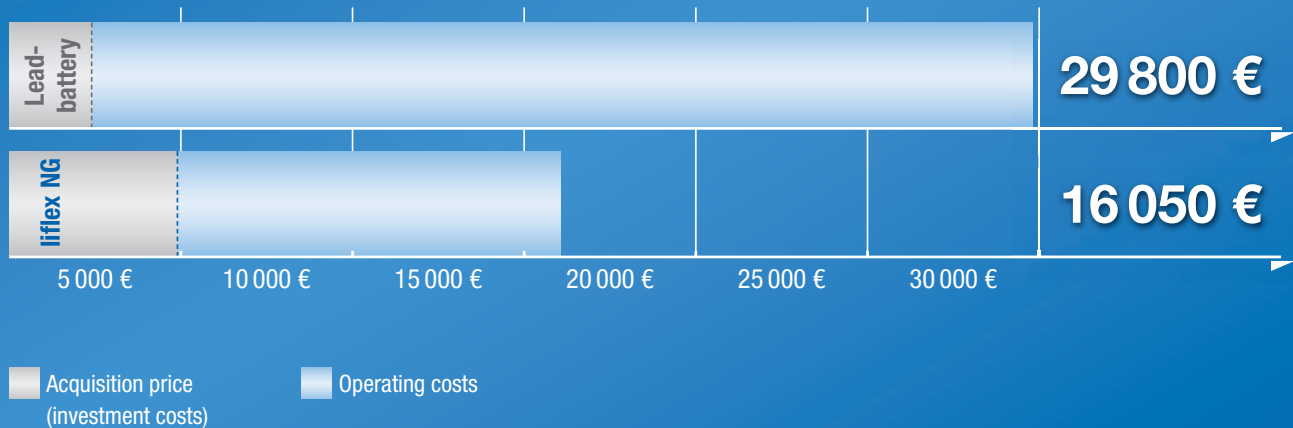


Fig. 4: Cost comparison lead batteries 375 Ah vs. liflex NG energy system 280 Ah based on a 2-shift operation over a period of 5 years (investment and operating costs).



## liflex NG – The energy system for intralogistics

- Fast charging capability
- Intermediate charging capable
- Maintenance-free (no water refilling)
- Lower operating costs
- Long service life
- Reliable operation

Fig. 5: liflex NG energy system consisting of BELATRON Li<sup>+</sup> charger 24 V / 80 A and liflex NG battery 24 V / 3.6 kWh (140 Ah)





## More energy, lower costs through opportunity charging

- Battery exchange not required
- Intermediate charging possible at any time (25 % charge in 20 min)
- 100 % charge in 2 h

## High resource utilization, high cost efficiency

liflex NG energy systems are fast-charging capable and can be used very effectively for intermediate charging. Charging takes place at a constant current. If opportunity charges are carried out during the respective breaks (1 x 15 min and 1 x 30 min per shift) in a 2-shift operation, battery exchange is not required.

Fig. 6 shows an example of the capacity curve of a liflex NG energy system 24 V / 7.2 kWh (280 Ah) in 2-shift operation with intermediate charges.

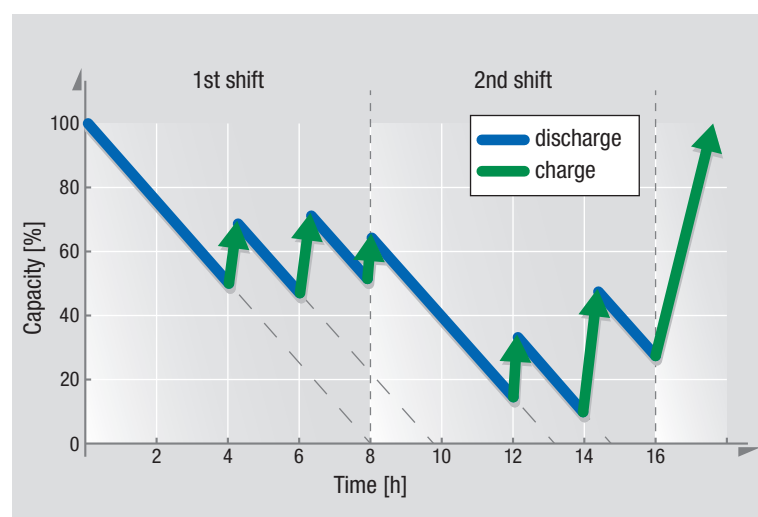


Fig. 6: Capacity curve of a liflex NG energy system in 2-shift operation with opportunity charges.

## liflex NG energy systems offer up to 30% higher energy efficiency

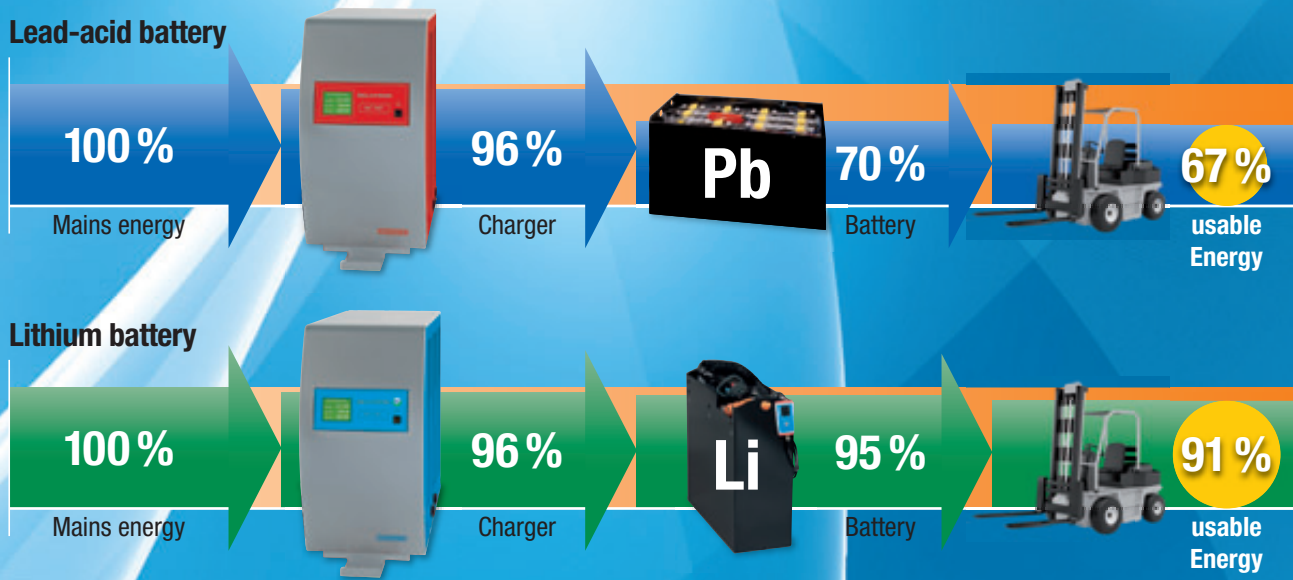


Fig. 7: Comparison of usable energy for lead-acid and lithium batteries



Fig. 8: liflex NG energy system  
24 V / 3.6 kWh (140 Ah)

## liflex NG – Low energy consumption, low CO<sub>2</sub> emission

- Reduced energy costs
- High efficiency
- Emission-free
- Low self-discharge
- Recuperable
- Stand-by mode
- Environmentally friendly
- Permanent cell monitoring
- Recyclable

# PzS lead-acid batteries v.s. LiFePO<sub>4</sub> lithium-ion batteries

Lead-acid batteries	Properties	Lithium-ion batteries
40 Wh/kg	Energy density	95 – 140 Wh/kg
Up to 70 %	Charge efficiency [%]	Up to 95 %
1200 cycles	Charge/discharge cycles	> 3000 cycles
On charge gas leakage with water loss	Emissions	Emission-free (absolutely gas-free)
Required	Maintenance	Not required
Charge: 50 % in approx. 3 h, 90 % in approx. 6 – 7 h	Fast charge capability	Charge: 90 % in approx. 1.5 – 2 h
Negative Lifetime effect	Intermediate charges	No negative Lifetime effect

Fig. 9: Comparison of physical and system-specific properties

## Comparison of important properties of lead-acid and lithium-ion batteries

From the view point of the user of battery powered industrial trucks, the existing drive system utilizing lead-acid batteries have some major disadvantages.

Significant improvements can be achieved through the use of lithium-ion batteries (see table Fig. 9). These energy systems are very robust and are characterized by an exceptionally long service life.

Current results suggest a lifetime of more than 3000 charge/discharge cycles. This is at least 2.5 times the average lifetime of PzS batteries.

As one of the pioneers for these new energy systems, BENNING offers common with the liflex NG series, standard energy systems with capacity values of 140 Ah, 280 Ah, 420 Ah and 560 Ah for the replacement of the previous PzS lead batteries in the range of 24 V, 48 V and 80 V for industrial trucks.

## liflex NG – Higher energy efficiency reduces your costs and protects the environment

As Fig. 7 shows, the electrochemical conversion of electrical energy in the lead-acid battery takes place with an efficiency of only approx. 70 %.

The losses occur due to the charge factor, the large voltage swing between charge and discharge, and the temperature rise in the battery during the charge/discharge process.

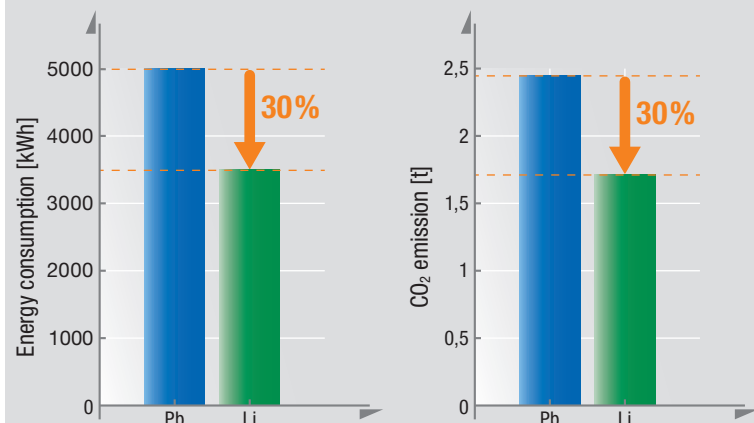


Fig. 10: Annual energy consumption and CO<sub>2</sub> emission for charging traction batteries – lead-acid battery (Pb) / lithium-ion battery (Li)

# Lithium vs. lead-acid battery – operating cost savings of a liflex NG energy system 24 V / 7.2 kWh (280 Ah)

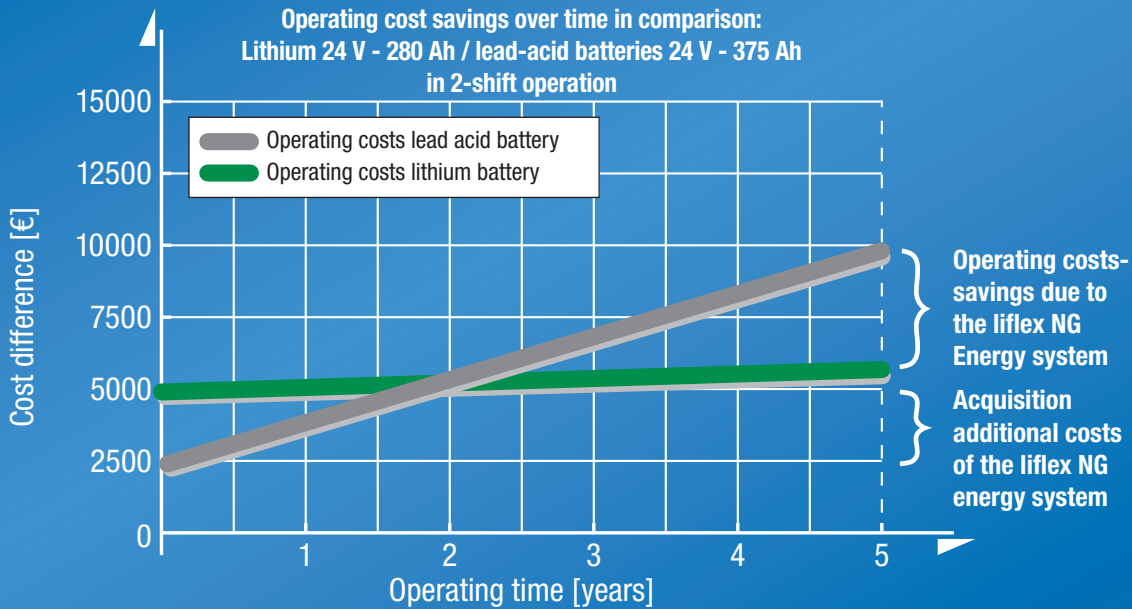


Fig. 11: After only 2 years, the additional costs for the investment in a liflex NG energy system are compensated by the operating cost savings



Fig. 12: liflex NG energy system with trough and onboard charger

## liflex NG – The energy system with operating cost advantages

- Approx. 30 % reduction in energy costs
- No maintenance costs
- No handling costs
- Use of the battery over several vehicle lifetimes
- No loading space costs



Fig. 13: liflex NG energy system 24 V / 3.6 kWh (140 Ah)



The diagrams (Fig. 11 and 14) show the large cost difference for maintenance and battery handling for lead-acid and lithium batteries. The basis for the cost comparison is a 2-shift operation with 2 lead batteries compared to 1 lithium battery.

In the case of lead batteries, maintenance is carried out once a week with refilling of water. With the liflex NG energy system, an inspection is required only once a year.

The battery replacement costs arise with lead batteries due to the 2-shift operation (10-12 battery changes/week).

With the liflex NG energy system, short-term intermediate charges are carried out and the battery change costs are eliminated.

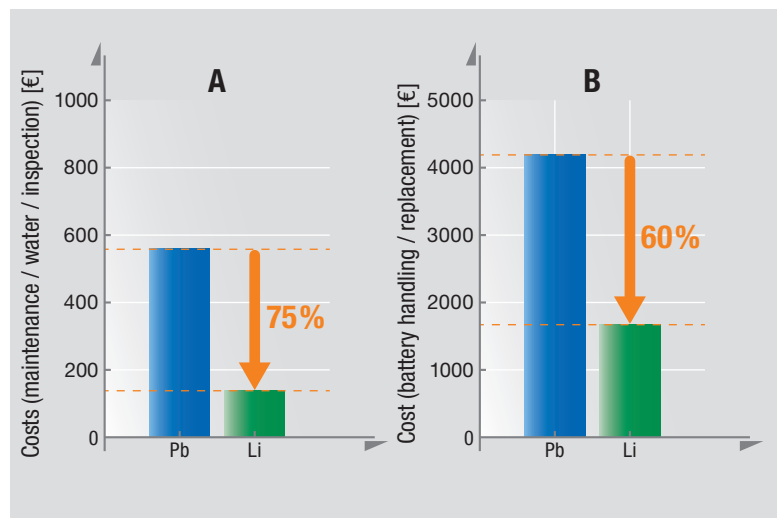


Fig. 14: Lead-acid battery (Pb) vs. liflex NG energy system (Li), annual cost comparison for:  
 A) maintenance and water or inspection (for 2-shift operation)  
 B) Battery handling / changing / charging (for 2-shift operation)

# Innovative BMS NG with patented Q-Leveling for higher efficiency and availability



## BMS NG with Q-Leveling instead of BMS: More efficient, safer, economical

For your battery we use our BMS NG, the fourth generation of our battery management systems. It is equipped with the innovative Q-Leveling process.

The patented Q-Leveling process not only measures and monitors the cell voltages, but also the capacity and fill level (SoC) of each individual cell.

Innovative algorithms compensate for the capacity differences between the individual cells by individually controlled charging currents already during the entire charging or discharging phases. For this purpose, liflex NG batteries are equipped with an additional secondary circuit that can assign an individual dynamic charge or discharge current to each cell.

The usable capacity of the battery is significantly increased compared to control via a standard BMS. The natural aging process of battery systems can be significantly slowed with the help of the BMS NG. This results in an increase in economic efficiency and enables operation far beyond the warranty period.

System comparison	BMS System	BMS NG System
Q-Leveling method	✗	✓
Free choice of cell manufacturers	✗	✓
Independence from cell parameters	✗	✓
Each cell can be operated individually	✗	✓
Capacity measurement of each cell	✗	✓
Replacement of individual cells conceivable	✗	✓
Power independent of the weakest cell	✗	✓
Long system lifetime	✗	✓
All system relevant information available	✗	✓

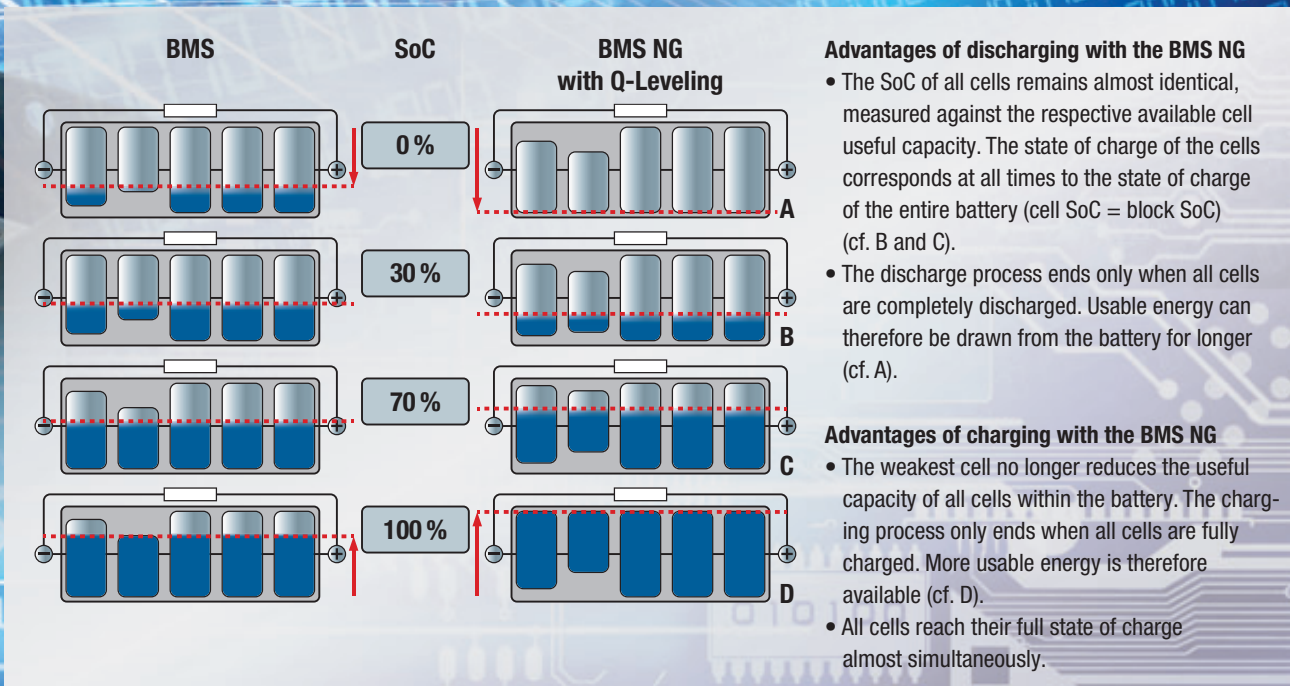


Fig. 15: Comparison of the charging and discharging processes of a lithium-ion battery, equipped with a classic BMS or the innovative BMS NG with Q-Leveling

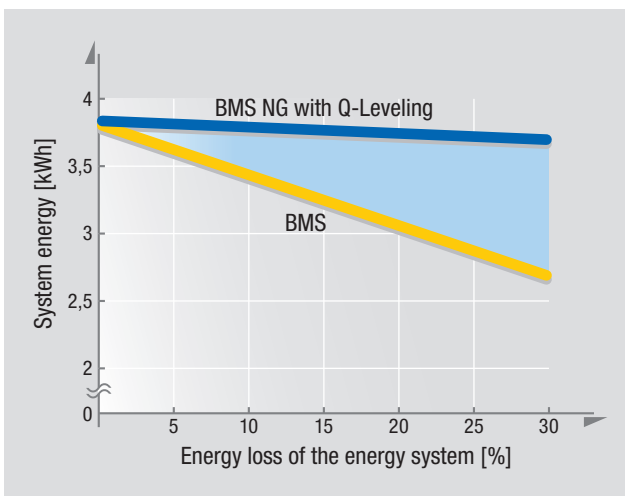


Fig. 16: System comparison – energy loss Standard BMS vs. BMS NG

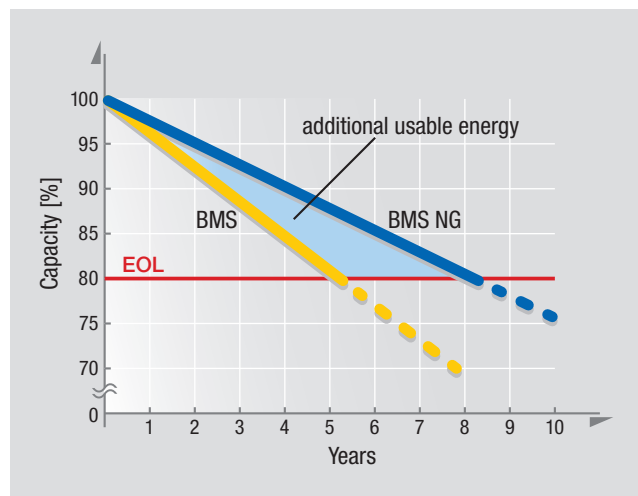
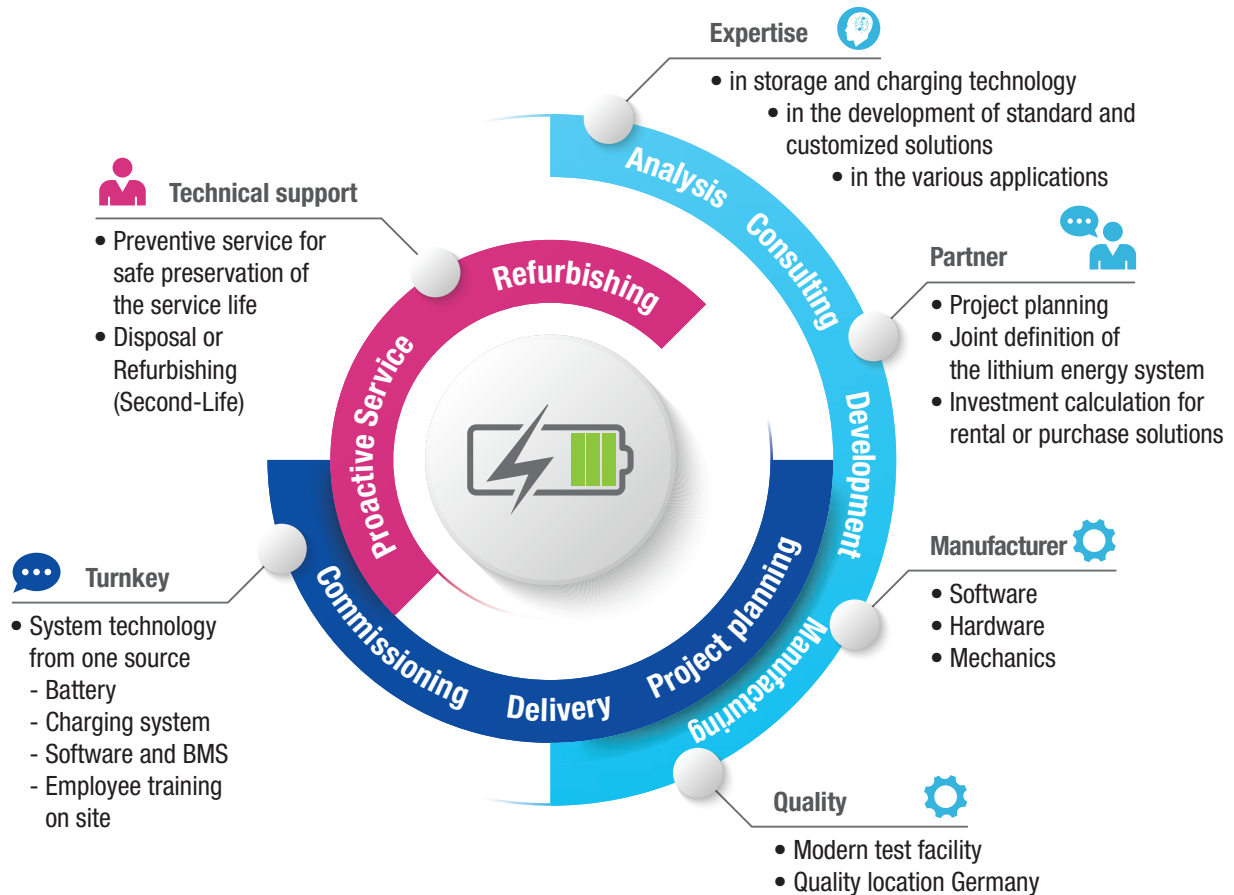


Fig. 17: Comparison of the lifetime of a lithium-ion battery (LFP 8S1P) equipped with a BMS or a BMS NG. The comparison shows the effect of the energy loss of a cell on the overall system. With the BMS NG, the loss is significantly lower.

# BENNING

## one contact person during the entire product lifecycle



### Sales – Your contact for Needs analysis and solution

For us, sales is more than selling. Our sales engineers have expert knowledge of the technology and the possibilities of its application. They analyze the planned application and determine the optimal lithium energy system. This ensures that we can implement the most economical and sustainable solution. If required, we record the application profile by a data logger during the project planning phase, analyze the results and present solutions.

### Hardware and software development – Innovative power for your projects

BENNING relies uncompromisingly on a development and manufacturing quality at the highest level, including:

- The software and hardware development in close cooperation with our customers
- Efficient quality management systems (ISO 9001)
- An integrated environmental management system (ISO 14001)

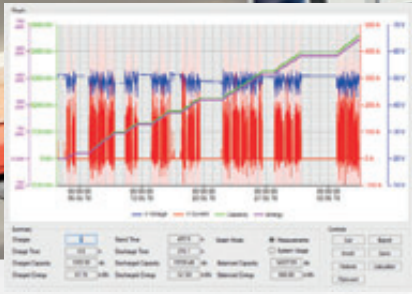
### Manufacturing – Quality made in Germany

Our lithium energy systems and chargers are German engineered and designed. We have thousands of lithium energy systems in the market. Each cell and BMS is individually recorded and therefore traceable over its entire lifetime.

### Rent or buy – Customized solutions

For each new project, we analyze the most suitable individual solution together with the customer: rent or purchase. We have developed our own rental price calculator for this purpose.





Software development data logger



Assembly hall



Series production



Certified quality management

## Service and preventive maintenance guarantee a long service life

Our lithium energy systems are largely maintenance-free. Nevertheless, every system should be checked regularly. If you do not have qualified personnel, we offer our service as a service. If you have your own service technicians, we will be happy to train your staff.

There are different service levels. Depending on the trained level, the service technician can go into the system in different depths. Our hotline is available 24/7.

## Up to 8 years of assured availability

In addition to the statutory warranty of 2 years, we offer an additional, extended warranty of up to 6 years when a preventive maintenance contract is concluded.

## Thinking and acting sustainably – Recycling or second life

We dispose of the batteries we produce for you at the end of their service life and work together with one of the largest disposal companies in Europe. Therefore, we recommend sending them back to our factory after consultation. We will take care of everything else for you.



Reachable worldwide

# Buy or rent, choose the most economical model for you



Fig. 18: Our rental model offers a comprehensive all-round service for your energy package

## Flexibility and maximum availability at a fixed monthly price

Perfectly matched to a company's specific operating processes, rental models for capital goods are now an integral part of cost-effective business management. They give the operator planning security and enable the use of state-of-the-art products.

The BENNING rental model for Li energy packages is aimed at vehicle and battery dealers as well as operators of industrial trucks. It offers the opportunity to experience the advantages of lithium-ion technology in practical use without any risk.

A service plan from BENNING is provided for the individual utilization period of the liflex NG energy package in the rental, which can be selected from 12 to 60 months. High initial investment costs are eliminated, as are incalculable expenses for service, maintenance or replacement.

Rental rates remain stable. The result is significantly reduced operating costs and a continuously available fleet of industrial trucks.

At the end of the contract period, the Energy package can be taken over.

## Economic efficiency

- Flexible response to order situations
- Planning reliability
- Calculable expenses
- No capital commitment
- Continuous availability

## Technical data: Battery

U <sub>N</sub>	Capacity	E	U <sub>Min</sub>	U <sub>Max</sub>	I <sub>N</sub>	Can Charger	Number modules	Number modules	Dimensions*		Weight	
									Standard	<i>Slim</i>	Standard	<i>Slim</i>
[V]	[Ah]	[kWh]	[V]	[V]	[A]		Series		H x W x D [mm]	H x W x D [mm]	[kg]	[kg]
24	140	3,6	21	29	70	REMA 160	1	1	450 x 608 x 124	580 x 624 x 98	57	70
24	280	7,2	21	29	140	REMA 160	1	2	450 x 608 x 248	580 x 624 x 196	104	128
24	420	10,8	21	29	210	REMA 320	1	3	450 x 608 x 372	580 x 624 x 294	151	186
24	560	14,3	21	29	280	REMA 320	1	4	450 x 608 x 496	580 x 624 x 392	198	244
48	140	7,2	42	58	70	REMA 160	2	2	450 x 608 x 248	580 x 624 x 196	104	128
48	280	14,3	42	58	140	REMA 160	2	4	450 x 608 x 496	580 x 624 x 392	198	244
48	420	21,5	42	58	210	REMA 320	2	6	450 x 1096 x 372	580 x 1128 x 294	292	360
48	560	28,7	42	58	280	REMA 320	2	8	450 x 1096 x 496	580 x 1128 x 392	386	476
80	140	14,3	83	115	70	REMA 160	4	4	450 x 608 x 496	580 x 624 x 392	198	244
80	280	28,7	83	115	140	REMA 320	4	8	450 x 1096 x 496	580 x 1128 x 392	386	476
80	420	43,0	83	115	210	REMA 320	4	12	450 x 1096 x 744	580 x 1128 x 584	574	708
80	560	57,3	83	115	280	REMA 320	4	16	450 x 1096 x 992	580 x 1128 x 784	762	940

Higher voltages, capacities and currents on request

\* Other dimensions on request

Battery cell types: LFP / LiFePO<sub>4</sub> (lithium iron phosphate)  
 Operating temperature: 0 °C to +40 °C  
 Nominal temperature: +23 °C  
 Storage temperature range: -20 °C to +35 °C (max. 6 months in charged condition)  
 Number of cycles: 3000 @ 80 % DOD  
 Operation: at ≤ 0 °C optional (integrated heating)

## Technical data: Charger

Battery liflex NG	Charging time* @ 25 °C [h]	Charger BELATRON Li+ liflex	Mains-voltage [V]	Mains-power [kVA]	Mains-current per phase [A]	Mains-fuse (slow-blow) [A]	Mains plug	DC plug	Dimensions H x W x D [mm]	Housing	Weight [kg]
24 V / 140 Ah	2.80	24 V / 50 A	230 V	1.57	6.8	10	Schuko	REMA160	352/400.5x220x127.5	WT16	5
24 V / 140 Ah	1.75	24 V / 80 A	230 V	2.52	10.9	16	Schuko	REMA160	400.5 x 220 x 237.5	WT32	11
24 V / 280 Ah	2.24	24 V / 125 A	3x400 V	3.88	5.6	16	CEE16	REMA160	603 x 312 x 201	WT60	20
24 V / 280 Ah	1.87	24 V / 150 A	3x400 V	4.68	6.7	16	CEE16	REMA160	603 x 312 x 201	WT60	20
24 V / 280 Ah	1.65	24 V / 170 A	3x400 V	5.30	7.6	16	CEE16	REMA320	603 x 312 x 305	WT120	31
24 V / 420 Ah	2.10	24 V / 200 A	3x400 V	6.24	9.0	16	CEE16	REMA320	603 x 312 x 305	WT120	31
24 V / 420 Ah	1.68	24 V / 250 A	3x400 V	7.79	11.2	16	CEE16	REMA320	603 x 312 x 305	WT120	31
24 V / 560 Ah	1.87	24 V / 300 A	3x400 V	9.35	13.5	16	CEE16	REMA320	603 x 312 x 409	WT180	31
48 V / 140 Ah	2.00	48 V / 70 A	3x400 V	4.70	6.8	16	CEE16	REMA160	603 x 312 x 201	WT60	20
48 V / 140 Ah	1.40	48 V / 100 A	3x400 V	6.19	8.9	16	CEE16	REMA160	603 x 312 x 201	WT60	20
48 V / 280 Ah	2.33	48 V / 120 A	3x400 V	8.07	11.6	16	CEE16	REMA160	603 x 312 x 305	WT120	31
48 V / 280 Ah	2.00	48 V / 140 A	3x400 V	8.67	12.5	16	CEE16	REMA160	603 x 312 x 305	WT120	31
48 V / 280 Ah	1.65	48 V / 170 A	3x400 V	10.53	15.2	16	CEE16	REMA320	603 x 312 x 305	WT120	31
48 V / 420 Ah	2.10	48 V / 200 A	3x400 V	12.38	17.9	20	CEE32	REMA320	603 x 312 x 305	WT120	31
48 V / 420 Ah	1.75	48 V / 240 A	3x400 V	14.86	21.4	25	CEE32	REMA320	603 x 312 x 409	WT180	45
48 V / 560 Ah	2.07	48 V / 270 A	3x400 V	16.72	24.1	32	CEE32	REMA320	603 x 312 x 409	WT180	45
48 V / 560 Ah	1.87	48 V / 300 A	3x400 V	18.58	26.8	32	CEE32	REMA320	603 x 312 x 409	WT180	45
80 V / 140 Ah	2.33	80 V / 60 A	3x400 V	7.39	10.7	16	CEE16	REMA160	603 x 312 x 201	WT60	20
80 V / 140 Ah	2.00	80 V / 70 A	3x400 V	8.63	12.5	16	CEE16	REMA160	603 x 312 x 201	WT60	20
80 V / 140 Ah	1.75	80 V / 80 A	3x400 V	9.86	14.2	16	CEE16	REMA160	603 x 312 x 305	WT120	31
80 V / 280 Ah	2.80	80 V / 100 A	3x400 V	12.32	17.8	20	CEE32	REMA160	603 x 312 x 305	WT120	31
80 V / 280 Ah	2.00	80 V / 140 A	3x400 V	17.25	24.9	25	CEE32	REMA160	603 x 312 x 409	WT180	45
80 V / 280 Ah	1.75	80 V / 160 A	3x400 V	19.72	28.5	32	CEE32	REMA320	603 x 312 x 409	WT180	45
80 V / 420 Ah	2.33	80 V / 180 A	3x400 V	22.18	32.0	32	CEE32	REMA320	603 x 312 x 409	WT180	45
80 V / 420 Ah	1.75	80 V / 240 A	3x400 V	29.58	42.7	50	CEE63	REMA320	1600 x 600 x 600	UC1666	o.r.
80 V / 560 Ah	1.87	80 V / 300 A	3x400 V	36.97	53.4	63	CEE63	REMA320	1600 x 600 x 600	UC1666	o.r.

\* Charging time depending on cell temperature

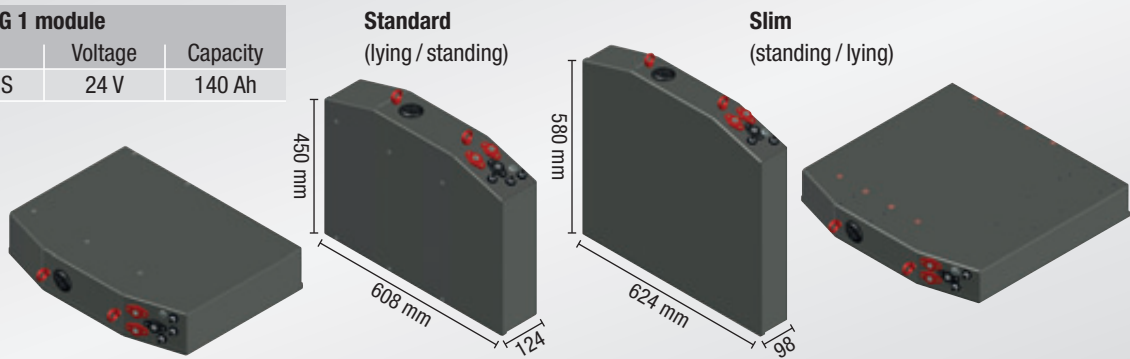
# The plus in flexibility – The systems can be used vertically or horizontally

## Examples of liflex NG module configurations\*

MP = Modules Parallel  
MS = Modules Serial

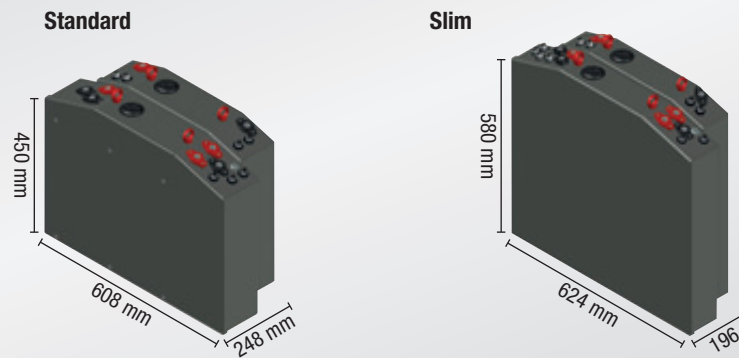
### liflex NG 1 module

Variant	Voltage	Capacity
1MP1MS	24 V	140 Ah



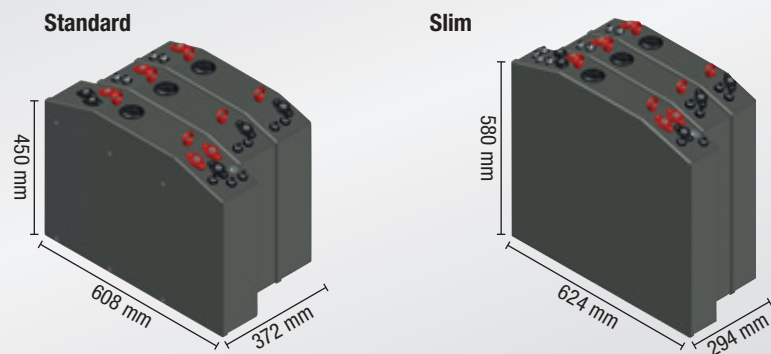
### liflex NG 2 modules

Variant	Voltage	Capacity
2MP1MS	24 V	280 Ah
1MP2MS	48 V	140 Ah



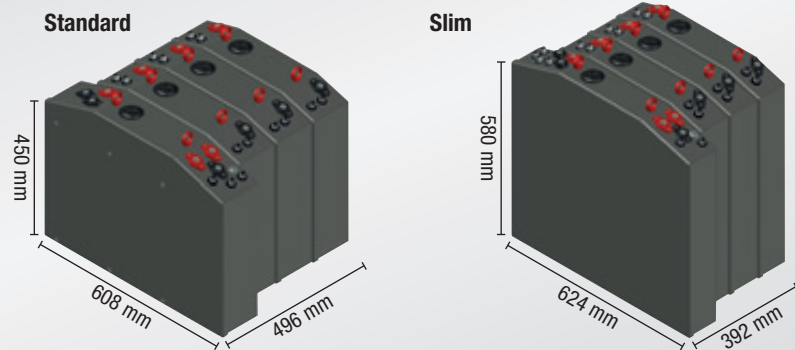
### liflex NG 3 modules

Variant	Voltage	Capacity
3MP1MS	24 V	420 Ah
1MP3MS	72 V	140 Ah



### liflex NG 4 modules

Variant	Voltage	Capacity
4MP1MS	24 V	560 Ah
2MP2MS	48 V	280 Ah
1MP4MS	96 V (80 V)	140 Ah



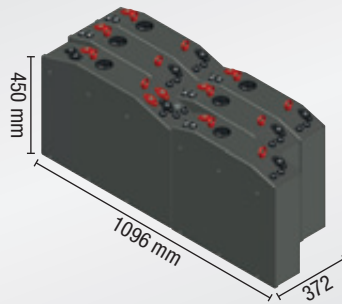
\* Further configurations on request

MP = Modules Parallel  
MS = Modules Serial

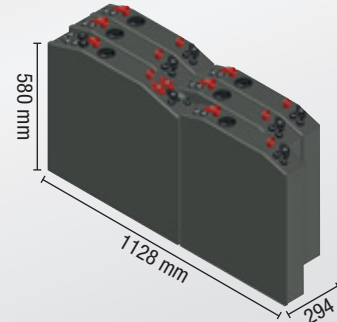
**liflex NG 6 modules**

Variant	Voltage	Capacity
6MP1MS	24 V	840 Ah
3MP2MS	48 V	420 Ah
2MP3MS	72 V	280 Ah

**Standard**



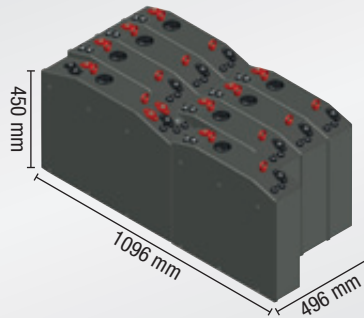
**Slim**



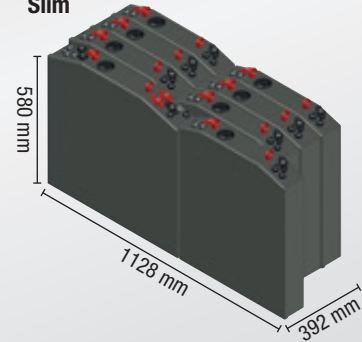
**liflex NG 8 modules**

Variant	Voltage	Capacity
8MP1MS	24 V	1120 Ah
4MP2MS	48 V	560 Ah
2MP4MS	96 V (80 V)	280 Ah

**Standard**



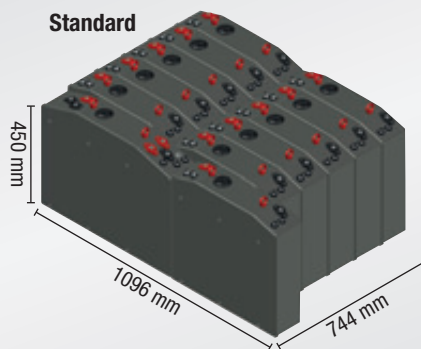
**Slim**



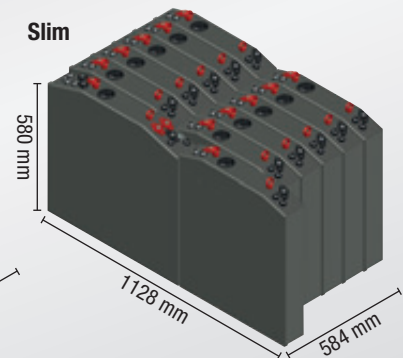
**liflex NG 12 modules**

Variant	Voltage	Capacity
12MP1MS	24 V	1680 Ah
6MP2MS	48 V	840 Ah
4MP3MS	72 V	560 Ah
3MP4MS	96 V (80 V)	420 Ah

**Standard**



**Slim**

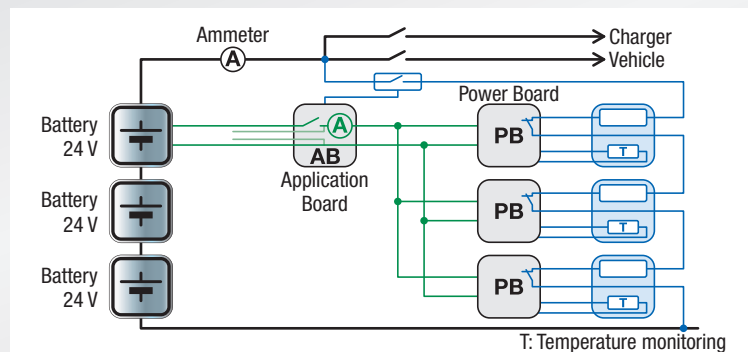


**Heating**

(optional)

Example of a block diagram of the optional heater. LFP cells can be discharged down to -20 °C, but can only be charged at temperatures above 0 °C, and this from approx. 8 °C to 10 °C with full charge current.

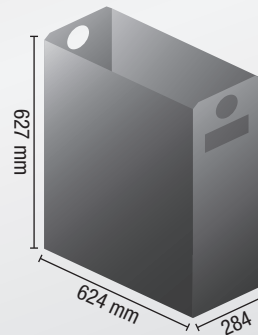
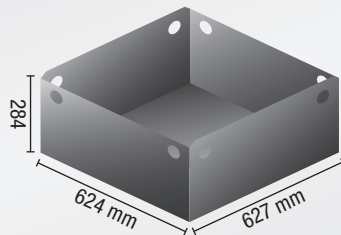
For this reason, a heater may be useful for your application.



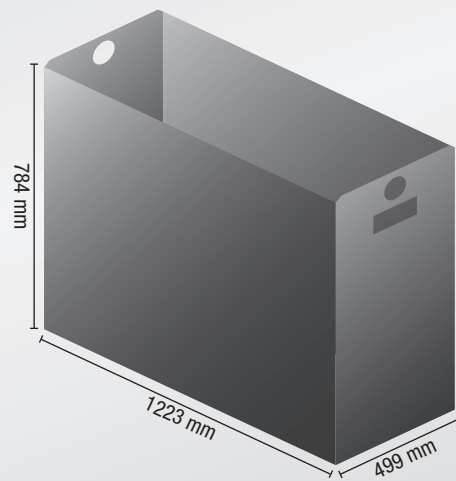
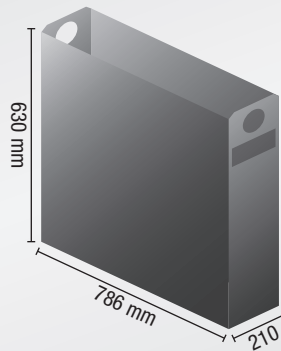
# liflex NG energy systems – also available with customized battery troughs

## Battery troughs (application examples)

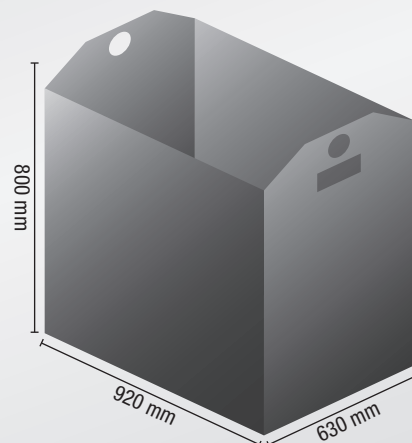
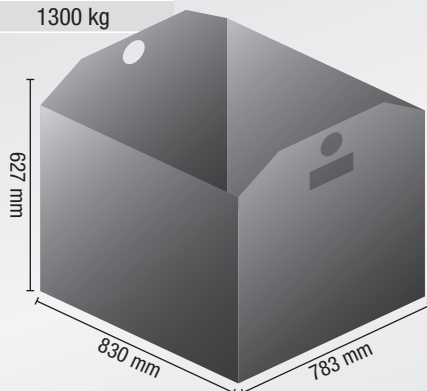
Battery type	Total weight
24 V/140 Ah	185 kg
24 V/140 Ah	272 kg
24 V/280 Ah	272 kg



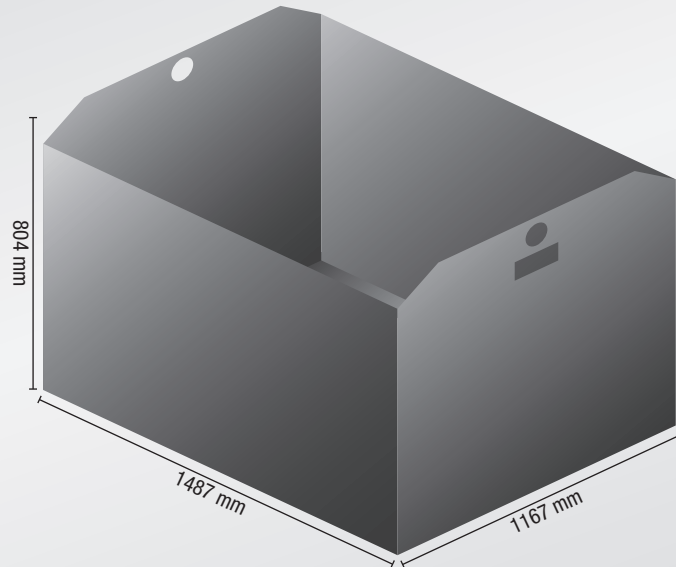
Battery type	Total weight
24 V/280 Ah	235 kg
24 V/560 Ah	1306 kg



Battery type	Total weight
48 V/560 Ah	1306 kg
48 V/560 Ah	1300 kg



Battery type	Total weight
<b>80 V/840 Ah</b>	4000 kg



*liflex NG energy system,  
onboard charger and trough*



**longevity**  
ensured by  
**Q-Leveling**



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