batterX® LC+ CARBON Storage Systems

The safe and environment-friendly energy storage with extra discharge power

The technology

In a further development of a Japanese technology, carbon additives are used for the negative electrode in the LC+ battery, which guarantees considerably lower sulphation and thus by far the best number of cycles for lead-based batteries: At 70% depth of discharge 3000 cycles are achieved, at 50% depth of discharge over 4500. Batteries of this type have been in use in Japan for about 15 years, so that there is extensive experience over entire life cycles. For this reason, carbon batteries are currently used in military installations and in transportation.

The advantages

The carbon battery is not only much cheaper than lithium batteries, but also 97% recyclable with sales profit and, unlike lithium batteries, is not a dangerous good. Transport, storage and use do not require any special precautions or insurance. The technology of the LC+ series has been known and tested longer than any lithium battery in the world and has therefore already reliably proven its characteristics. In terms of UPS discharge capacity (up to C3), the carbon battery far surpasses lithium technology (up to C 0.7), making it ideal for use in emergency power supply: if a lot of energy is required, it can be called up at any time. In addition, the carbon battery does not require a Battery Management System (BMS), thus eliminating the potential source of danger "battery electronics".

The disadvantages

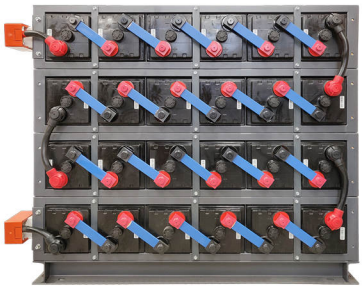
The carbon battery is slightly larger and heavier than lithium batteries, which must be considered during transport and installation.

LC+700

LC+1300

Modular cabinet solution

LC+24 (48V/24kWh)



LC+48 (48V/48kWh)

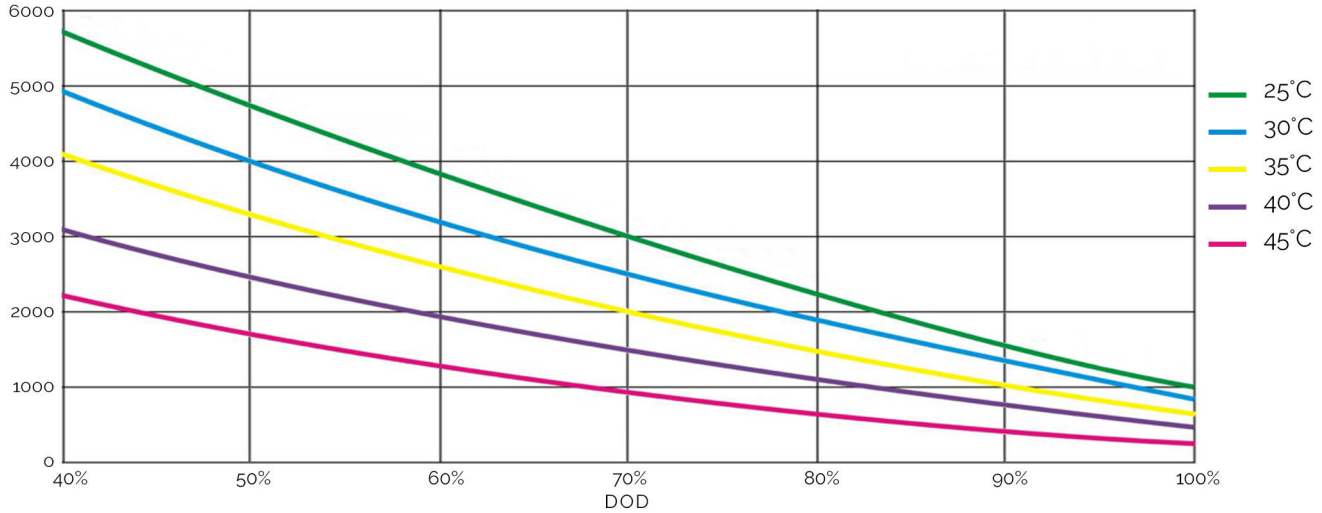
CERTIFICATES

SAFETY

CARBON BATTERY LC+ (12V)

SPECIFICATIONS

Number of cycles vs. depth of discharge



	LC+700	LC+1300
Nominal voltage	12 V	
Maximum current	Charge: C0,2 ; Discharge: C0,4	
Nominal capacity at 25˚C	50Ah (C_{10})	100Ah (C_{10})
Nominal capacity at discharge with C0,1	700Wh (C0,1 = 5 A)	1300Wh (C0,1 = 10 A)
Cycles	More than 3000 cycles at 70% DoD	
Design life	15 years at 25˚C	
Dimensions ; Weight	350x165,5x175mm ; 25,5kg	345x172x275mm ; 45kg
Short circuit current	1500 A	2000 A
internal resistance at 25˚C	4,7 Ω	4,1 Ω
Terminals	m6x12	m8x18
Standards	IEC60896-21/22:2004, BS6290-4, Eurobat, Installation according to EN50272-2	

LC+700 - 25,5 kg

C-rate vs. capacity

LC+700

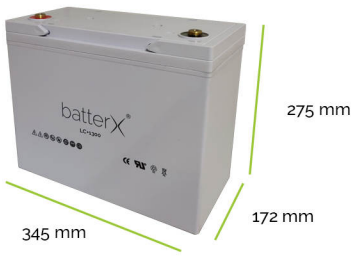
C-rate	current	capacity
C0,1	5 A	700 Wh
C0,2	10 A	610 Wh
C0,4	20 A	550 Wh
C1,0	50 A	410 Wh

LC+1300

C-rate	current	capacity
C0,1	10 A	1300 Wh
C0,2	20 A	1230 Wh
C0,4	40 A	1100 Wh
C1,0	100 A	800 Wh

(end of discharge voltage 10.8V ; temperature 25˚C)

LC+1300 - 45 kg



Discharge currents at 25˚C, A

LC+700

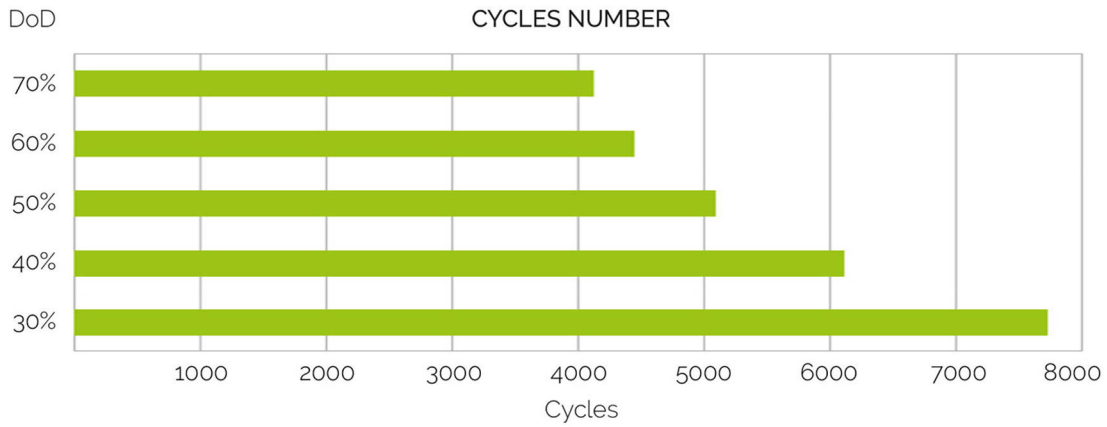
end of discharge voltage per cell / per battery	1h	2h	3h	5h	8h	10h	20h	50h	100h	120h	240h
1,75 V / 10,5 V	27,50	20,20	13,00	9,00	6,84	5,24	3,09	1,24	0,639	0,555	0,295
1,80V / 10,8 V	**26,90**	**19,60**	**12,50**	**8,50**	**6,50**	**5,00**	**2,96**	**1,19**	**0,627**	**0,545**	**0,291**
1,85 V / 11,1 V	26,00	18,70	12,00	8,00	6,00	4,80	2,80	1,14	0,601	0,528	0,281
1,90 V / 11,4 V	24,00	17,20	10,90	7,20	5,44	4,36	2,55	1,04	0,563	0,491	0,258
1,95 V / 11,7 V	21,60	15,20	9,30	6,20	4,66	3,75	2,04	0,83	0,452	0,402	0,215

LC+1300

end of discharge voltage per cell / per battery	1h	2h	3h	5h	8h	10h	20h	50h	100h	120h	240h
1,75 V / 10,5 V	55,00	40,60	26,40	18,00	13,70	10,50	6,18	2,48	1,278	1,110	0,590
1,80 V / 10,8 V	**53,80**	**39,20**	**25,00**	**17,00**	**13,00**	**10,00**	**5,92**	**2,38**	**1,254**	**1,090**	**0,582**
1,85 V / 11,1 V	52,00	37,40	24,00	16,00	12,00	9,60	5,60	2,28	1,200	1,056	0,562
1,90 V / 11,4 V	48,00	34,40	21,80	14,40	10,90	8,72	5,10	2,08	1,126	0,982	0,516
1,95 V / 11,7 V	43,20	30,40	18,60	12,40	9,32	7,50	4,08	1,66	0,904	0,804	0,430

CARBON BATTERY LC+ (2V)

SPECIFICATIONS



	LC+2V500	LC+2V1000
Nominal voltage	2 V	
Maximum current	Charge: C0,2 ; Discharge: C0,4	
Nominal capacity at 25˚C	500 Ah (C_{10})	1000 Ah (C_{10})
Nominal capacity at discharge with C0,1	1000 Wh (C0,1 = 50 A)	2000 Wh (C0,1 = 100 A)
Cycles	More than 42000 cycles at 70% DoD	
Design life	15 years at 25˚C	
Dimensions ; Weight	508x172x166 mm ; 41 kg	508x172x303 mm ; 75 kg
Short circuit current	1500 A	2000 A
internal resistance at 25˚C	4,7 Ω	4,1 Ω
Terminals	m6x12	m8x18
Standards	IEC60896-21/22:2004, BS6290-4, Eurobat, Installation according to EN50272-2	

C-rate vs. capacity

LC+2V500

C-rate	current	capacity
C0,1	50 A	500 Wh
C0,2	100 A	435 Wh
C0,4	200 A	395 Wh
C1,0	500 A	295 Wh

LC+2V1000

C-rate	current	capacity
C0,1	100 A	1000 Wh
C0,2	200 A	945 Wh
C0,4	400 A	845 Wh
C1,0	1000 A	620 Wh

(end of discharge voltage 10.8V ; temperature 25˚C)

Discharge currents at 25˚C, A

LC+2V500

Discharge time (h)	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h
Constant Current (A)	361,6	209,7	152,4	121,6	102,0	88,4	78,3	70,5	64,3	59,2
Constant power (W)	675,9	398,4	292,4	234,8	198,0	172,3	153,2	138,4	126,5	116,7

LC+2V1000

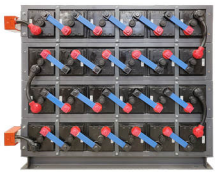
Discharge time (h)	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h
Constant Current (A)	689,6	405,6	297,4	238,6	201,1	174,9	155,4	140,3	128,2	118,3
Constant power (W)	1310,5	774,6	569,5	457,8	386,5	336,6	299,5	270,6	247,5	228,5

batterX® LC+ Carbon Storage Systems

Model	**LC+10**
Capacity at C0,1 / 25˚C	100% DoD: 10 kWh
	70%DoD: 5 kWh
Battery	8 x LC+1300
Cabinet	1 x LC8
Charging current C0,15	30 A
Normal Discharging current C0.2	40 A
UPS Discharging current C1	200 A
Dimensions (LxWxH)	763x385x845 mm
Weight	390 kg

Model	**LC+15**
Capacity at C0,1 / 25˚C	100% DoD: 15 kWh
	70%DoD: 10 kWh
Battery	12 x LC+1300
Cabinet	2 x LC8
Charging current C0,15	45 A
Normal Discharging current C0.2	60 A
UPS Discharging current C1	300 A
Dimensions (LxWxH mm)	2 x 763x385x845 mm
Weight (kg)	600 kg

Model	**LC+20**
Capacity at C0,1 / 25˚C	100% DoD: 20 kWh
	70%DoD: 14 kWh
Battery	16 x LC+1300
Cabinet	2 x LC8
Charging current C0,15	60 A
Normal Discharging current C0.2	80 A
UPS Discharging current C1	400 A
Dimensions (LxWxH mm)	2 x 763x385x845 mm
Weight (kg)	780 kg



Model	**LC+24**
Capacity at C0,1 / 25˚C	100% DoD: 24 kWh
	70%DoD: 17 kWh
Battery	24 x LC+2V500
Cabinet	1 x LC+ rack 48V for LC+24
Charging current C0,15	75 A
Normal Discharging current C0.2	100 A
UPS Discharging current C1	500 A
Dimensions (LxWxH mm)	1125x515x976 mm
Weight (kg)	1200 kg

Model	**LC+48**
Capacity at C0,1 / 25˚C	100% DoD: 48 kWh
	70%DoD: 34 kWh
Battery	24 x LC+2V1000
Cabinet	1 x LC+ rack 48V for LC+48
Charging current C0,15	150 A
Normal Discharging current C0.2	200 A
UPS Discharging current C1	1000 A
Dimensions (LxWxH mm)	1125x475x1524 mm
Weight (kg)	2100 kg