

LIVEN LVJ series batteries are manufactured with AGM separator and colloidal or foamed silica. The proven silica gel technology improves battery cycle life and performance at cold ambient temperatures. The number of deep discharge cycles is increased much compared with the normal AGM batteries.

MAIN APPLICATIONS:

Solar and wind systems

Cable TV

Telecommunications

Wheelchair

Marine Equipment

Military Equipment

Emergency lighting

Power Plants

Medical Devices

Golf Cart.



Specifications

Liven Model No.	Voltage	Capacity	Dimension(mm)				Weight (kg) ±4%	Terminal Type
	(V)	Ah / C20	L	W	H	Total H		
LVJ18-12	12	18	181	76	166	166	5,30	INSERT
LVJ20-12	12	20	181	76	166	166	5,60	INSERT
LVJ26-12	12	26	166	175	125	125	7,32	INSERT
LVJ26-12H	12	26	166	126	174	174	8,00	INSERT
LVJ28-12	12	28	166	175	125	125	7,90	INSERT
LVJ30-12	12	30	166	175	125	125	8,70	INSERT
LVJ33-12	12	33	196	131	161	164	10,80	INSERT
LVJ36-12	12	36	196	131	161	164	11,50	INSERT
LVJ40-12	12	40	196	165	170	170	12,80	INSERT
LVJ45-12	12	45	196	165	170	170	14,20	INSERT
LVJ50-12	12	50	196	165	170	170	15,20	INSERT
LVJ55-12	12	55	228	138	208	213	17,20	INSERT
LVJ60-12	12	60	260	167	213	216	21,20	INSERT
LVJ75-12	12	75	261	173	221	224	23,10	INSERT
LVJ90-12	12	90	305	168	207,5	212,5	28,40	INSERT
LVJ100-12	12	100	330	173	217	220	29,30	INSERT
LVJ120-12	12	120	407	173	224	231,5	35,60	INSERT
LVJ135-12	12	135	345	172	273	278	42,00	INSERT
LVJ150-12	12	150	485	172	240	240	42,90	INSERT
LVJ180-12	12	180	522	239	218	223	55,20	INSERT
LVJ200-12	12	200	522	239	218	223	60,10	INSERT
LVL230-12	12	230	521	269	220	225	65,20	INSERT
LVJ250-12	12	250	521	269	220	225	70,50	INSERT
LVJ260-12	12	250	521	269	220	225	74,00	INSERT



FLOODED TUBULAR BATTERIES



OPzS - TECHNICAL DATA

Living Energy

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Company Profile

Thanks a great experience based in all areas of the sector, Liven Battery is one of the few suppliers able to offer its customers the most current technology under one company: AGM, GEL, OPzV and lithium, among others.

The diverse technologies of LIVEN Battery covers all the applications and needs in the battery field, for example: Uninterruptable Power Supply (SAI-UPS), system applications, production IT, renewable solar photovoltaic, wind energy, security surveillance, telecommunications equipment, security systems, defense applications, radio beacons, nautical, electric cars, carriages and golf carts and electro-medical systems; are some of the systems LIVEN Battery can supply.

Liven Battery Iberica offers the added value of providing the complete project solution from the initial consult, technological advice, battery supply, installation and the removal of the replaced elements; design and production of the storage enclosure or battery racks and accessories needed for installation.

OPzS

Batteries in the OPzS range has the highest levels of reliability and has been used in all solar and wind power plant application.

OPzS range offers high cycle consistency. Our batteries has increased capacity compared to the requirements of the DIN standard.

Stationary OPzS batteries are used for energy storage in solar, wind and hybrid power plants. Characteristics of the battery life in the solar system is very different from a classic stationary battery. In solar system the battery is the energy storage, which is used at night, with no power from solar panels. Thus, in practice it is cycling with loading during the day and discharging at night. Liven's response to the needs of solar applications is the development of new types of cells well adapted to the way of working through the use of cores special alloys and a special type of separator improving electrical parameters and life of cell.

Main Features

- capacity range: 161Ah ÷ 3340Ah (C10, UEND=1.80V/cell @ +20°C) is higher than DIN standard capacity,
- dimensions accordance to DIN 40736-1 standard,
- service life: 1500 cycles @ +20°C, DOD 80% or 20 year,
- high reliability,
- low maintenance,
- container is made of transparent SAN,
- cells equipped with patented LIVEN recombination plug RecPlug1 results in:
 - low explosion risk,
 - topping-up interval: a couple of years.

Technical Data

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- operating mode:
floating and cycles mode with daily cycle,
- recommended charging characteristic „IU“ acc. to EN 50272-2 and DIN 41773,
- stand-by floating mode recommended float charge voltage:
2.25 V/cell ~ 2.30 V/cell @ +20°C acc. to DIN 41773,
- boost charging: 2.4V/cell and 4 x I10 max. for 24h and t < +30 °C,
- maximum charging current: IU characteristic acc. to DIN 41773:
t < 25 °C unlimited ,
t > 25 °C 4xI10,
- float voltage compensation in function of temperature: -2 mV/°C ÷ -4mV/°C,
- ventilation requirements: acc. to EN 50272-2,
- operating temperature range:
 - recommended:
+15°C ÷ +25°C,
 - maximum long term operating temperature:
+30°C (with ventilation assured - reduced service life),
 - maximum short term operating temperature (for hours):
+50°C (with ventilation assured - reduced service life),
 - minimum long term operating temperature:
+5°C (operating in lower temperature is not preferred according to possibility battery freezing in discharge case),
- self-discharge <3%/month @ +20 °C acc to EN 60896-21,
- topping-up interval with recombination plug: a couple of years ,
- stands and racks: special LIVEN racking and bases. Bases are made of steel (square tubes) coated with polyethylene fluidization method. Resistance to electrostatic short circuit above 7kV. We project and produce structures according to customer documentation, or perform individual project for the special rooms or spaces,

Standards

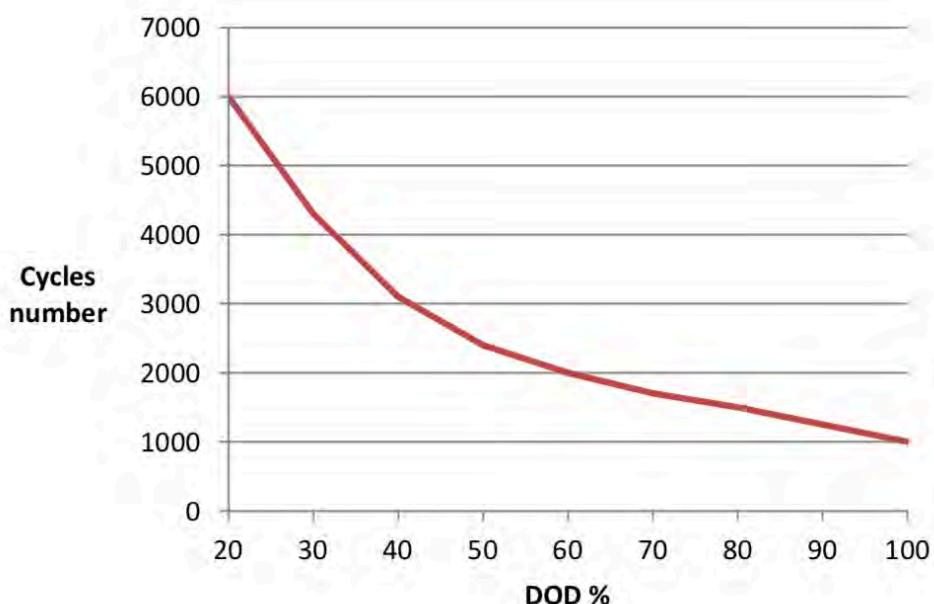
- EN 60896
- DIN 40736, DIN 41773, DIN 41774, DIN 41775
- EN 50272-2:2003
- ISO 9001 i ISO 14001

Charging Time IU Characteristic

Charging characteristic "IU" 2.4 V/cell										
	Charging current I_{10} (10A/100Ah)					Charging current I_{20} (20A/100Ah)				
State of charge	60%	80%	95%	100%	Full of charge	60%	80%	95%	100%	Full of charge
DOD	Charging time [h]					Charging time [h]				
20%	< 0,5	0,5	1,5	2,6	16	< 0,5	<0,5	1	2,5	14
40%	< 0,5	2	3,5	4,6	17	<0,5	1	2	3,3	15
60%	2	4	5,5	6,6	18	1	2	3	4,3	16
80%	4	6	8	8,6	20	2	3	4	5,3	17
100%	6	8	10	10,6	24	3	4	5	6,3	18

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Cycles number vs DOD (Deep Of Discharge)



Construction

- **positive plate** – the grid of the tubular positive plate consists of several lead spines which are joined together by the upper frame. Spines are being die-casted. These thin lead spines, which are equipped with small concentric vanes, are covered with acid permeable tubes. Between the lead spines and tubes is the active positive material. Tubes are being wet-filled. A special lead alloy which is used for positive plate,
- **negative plate** – lead grid pasted with active material forms the negative plate. Grids are being die-casted. A special lead alloy which is used for negative grid. Negative plates are wrapped Sireg net prevented loss active mass,
- **separators** – Daramic, polyethylene, low resistance, high acid proof, microporous material.
- **container** – the cell container is made of transparent SAN,
- **lid** – is made of grey ABS and equipped with well proven seal for leakage-proof insulation of the terminal construction. Lid and container are being glued and is proof against the escape of gas or leakage of electrolyte,



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- **terminals** – are being made from corrosion resistant lead alloy with brass inserted designed to give minimum resistance.,
- **terminals sealing** – plastic grommet with special seal,



- **connector** – fully insulated solid copper with full insulated screw with measurements hole,



- **standard recombination plug RecPlug1**
 - elimination of necessity of electrolyte refilling,
 - increased work safety of cells with liquid electrolyte (electrolyte fumes and gas poisoning compounds are not released to environment),
 - limiting of ventilation, battery rooms provided with cells with recombination plugs have smaller ventilation requirements.
- **electrolyte** – sulphuric acid with a density 1,24kg/dm³ @+20°C/max level/full charged cell.



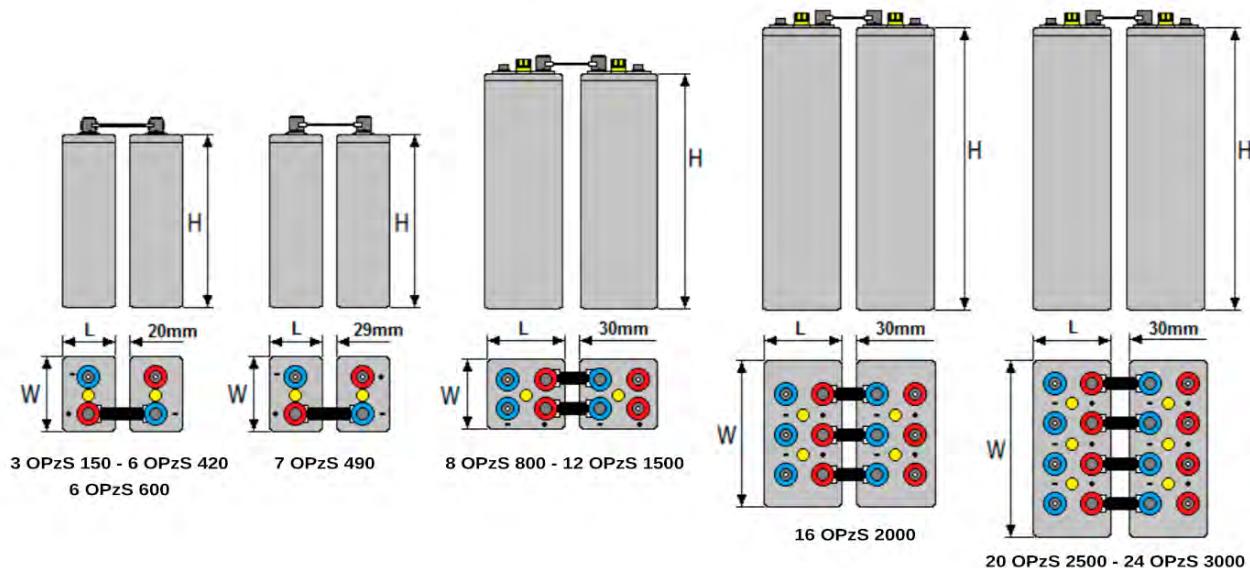
Dimensions and Technical data

Type	Voltage (V)	Capacity (Ah at 20°C)					Charging current $I_{nom}^{(1)}$ (A)	Length (mm)	Width (mm)	Height (mm)	Dry Weight (kg) ±5%	Wet Weight (kg) ±5%
		C100 Ue 1.85 V/cell	C50 Ue 1.85 V/cell	C24 Ue 1.83 V/cell	C10 ⁽²⁾ Ue 1.80 V/cell	C _{nom} Ue 1.80 V/cell						
3 OPzS 150	2	212	201	185	161	150	15	103	206	369	11	16
4 OPzS 200	2	283	268	247	215	200	20	103	206	369	13	18
5 OPzS 250	2	353	333	310	268	250	25	124	206	369	16	22
6 OPzS 300	2	423	398	372	322	300	30	145	206	369	18	26
5 OPzS 350	2	523	493	456	388	350	35	124	206	485	20	29
6 OPzS 420	2	623	588	545	465	420	42	145	206	485	24	34
7 OPzS 490	2	733	688	636	542	490	49	166	206	485	28	39
6 OPzS 600	2	913	863	799	656	600	60	145	206	660	35	50
8 OPzS 800	2	1223	1148	1066	875	800	80	210	191	660	46	65
10 OPzS 1000	2	1523	1428	1327	1093	1000	100	210	233	660	57	80
12 OPzS 1200	2	1823	1718	1594	1312	1200	120	210	275	660	66	93
12 OPzS 1500	2	2173	2013	1846	1670	1500	150	210	275	810	88	119
16 OPzS 2000	2	2903	2688	2474	2227	2000	200	212	397	792	106	152
20 OPzS 2500	2	3616	3353	3077	2783	2500	250	212	487	792	145	200
24 OPzS 3000	2	4351	4030	3706	3340	3000	300	212	576	792	170	240

@ +20°C

(1) Nominal and parameters according to DIN 40736

(2) Capacity C10 after 10 cycles



Battery Stands

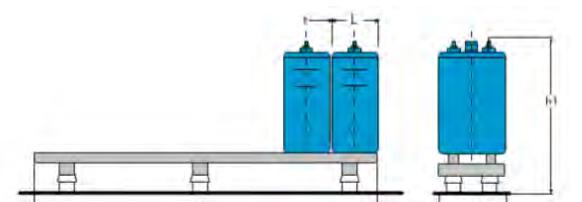
LIVEN is a manufacturer of all types of corrosion resistant stands for OPzS batteries. The stands are made of square tube and covered with polyethylene by fluidization. We design housing in accordance with customer's documentation or carry out our own project individually according to the target room dimension.

CONSTRUCTION

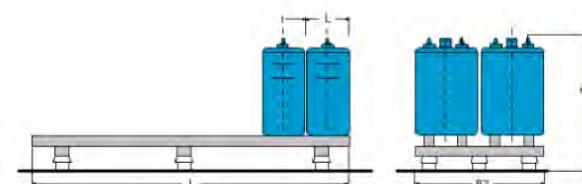
- purpose: to put together any type of battery cells on one or more levels,
- construction: made of closed metal profiles. Produced sets are fully welded,
- corrosion protection: protected against electrolyte by a coating made of high quality polyethylene thicker than 1 mm, immersed in fluidized bed reactor on our modern technological line,
- resistance to electrostatic short circuit above 7kV,
- separation from the ground: insulators made of ABS plastic with adjustable height,
- location of cells: on carrier brackets, which spacing can be adjusted to their width.
- Versatile design of stands enables the use of additional stands brackets for cells of more than 200kg.

Dimensions and Technical Data Stands

Type	B 1	B 2	h1	t	$I = N \times (L + t)$ (N - cells number)
3 OPzS 150	250	500	610	20	
4 OPzS 200	250	500	610	20	
5 OPzS 250	250	500	610	20	
6 OPzS 300	250	500	610	20	
5 OPzS 350	250	500	725	20	
6 OPzS 420	250	500	725	20	
7 OPzS 490	250	500	725	29	
6 OPzS 600	250	500	940	20	
8 OPzS 800	250	470	940	30	
10 OPzS 1000	320	550	940	30	
12 OPzS 1200	320	640	940	30	
12 OPzS 1500	320	640	1090	30	
16 OPzS 2000	400	880	1070	30	
20 OPzS 2500	470	1060	1070	30	
24 OPzS 3000	620	1240	1070	30	



Single-row stands



Double-row stands

Performance Data Constant Current Discharge

Constant current discharge (in A) @ +20°C to the end-of-discharge voltage

Type	Discharge time							
	2h	3h	4h	5h	6h	8h	10h	24h
3 OPzS 150	57.0	43.5	35.8	30.1	26.4	21.0	18.0	8.9
4 OPzS 200	76.1	58.0	47.7	40.1	35.2	28.0	24.0	11.9
5 OPzS 250	93.9	71.7	58.8	49.5	43.5	34.5	29.6	14.8
6 OPzS 300	112.7	86.2	70.9	59.7	52.5	41.6	35.7	17.8
5 OPzS 350	144.9	111.8	91.3	77.3	67.4	54.5	46.1	23.5
6 OPzS 420	175.0	133.8	109.8	93.1	81.1	65.5	55.4	28.2
7 OPzS 490	204.0	156.9	128.3	108.7	94.8	76.6	64.8	32.9
6 OPzS 600	239.9	184.5	151.9	126.9	111.7	88.5	76.0	38.9
8 OPzS 800	318.6	245.1	201.9	168.4	147.8	116.5	100.9	51.8
10 OPzS 1000	398.7	306.8	252.7	210.5	185.7	145.7	126.3	64.5
12 OPzS 1200	478.7	367.4	281.9	252.7	222.4	174.9	151.2	77.4
12 OPzS 1500	559.4	435.6	357.1	304.7	267.4	216.1	179.9	88.5
16 OPzS 2000	747.3	580.8	476.8	406.2	356.7	289.1	240.8	119.7
20 OPzS 2500	935.4	727.4	597.1	508.2	446.6	361.9	301.4	149.3
24 OPzS 3000	1118.3	871.3	715.0	609.2	535.6	432.8	361.4	178.6

Type	Discharge time							
	2h	3h	4h	5h	6h	8h	10h	24h
3 OPzS 150	53.4	40.7	33.5	28.2	24.8	19.7	16.8	8.3
4 OPzS 200	71.2	54.3	44.7	37.6	33.0	26.2	22.5	11.1
5 OPzS 250	89.0	67.9	55.8	46.9	41.3	32.7	28.0	14.0
6 OPzS 300	106.5	81.5	67.0	56.4	49.6	39.3	33.7	16.8
5 OPzS 350	126.4	97.5	79.6	67.4	58.8	47.5	40.2	20.5
6 OPzS 420	152.2	116.4	95.5	80.9	70.6	57.0	48.2	24.5
7 OPzS 490	177.1	136.3	111.4	94.4	82.3	66.5	56.3	28.6
6 OPzS 600	219.9	169.1	139.2	116.3	102.4	81.1	69.7	35.7
8 OPzS 800	293.5	225.8	186.0	155.1	136.2	107.3	92.9	47.7
10 OPzS 1000	367.1	282.5	232.7	193.9	171.0	134.2	116.3	59.4
12 OPzS 1200	440.7	338.2	259.6	232.7	204.8	161.0	139.2	71.3
12 OPzS 1500	553.2	430.7	353.0	301.3	264.4	213.7	177.9	87.5
16 OPzS 2000	737.2	572.9	470.4	400.7	351.9	285.2	237.6	118.1
20 OPzS 2500	922.3	717.2	588.7	501.1	440.4	356.8	297.2	147.2
24 OPzS 3000	1104.3	860.4	706.1	601.6	528.9	427.4	356.8	176.4

Performance Data Constant Current Discharge

Constant current discharge (in A) @ +20°C to the end-of-discharge voltage

Type	Discharge time							
	2h	3h	4h	5h	6h	8h	10h	24h
3 OPzS 150	51.5	39.5	32.7	27.5	24.3	19.7	16.6	8.2
4 OPzS 200	68.6	52.6	43.6	36.7	32.4	26.2	22.1	10.9
5 OPzS 250	85.9	65.6	54.4	45.9	40.5	32.1	27.5	13.7
6 OPzS 300	103.5	78.6	65.3	55.1	48.5	38.6	33.1	16.5
5 OPzS 350	123.4	95.3	78.4	66.6	58.0	46.8	39.7	20.2
6 OPzS 420	148.2	114.4	94.1	79.9	69.6	56.3	47.5	24.1
7 OPzS 490	173.1	133.3	109.4	93.3	81.1	65.6	55.5	28.2
6 OPzS 600	210.9	164.1	136.2	113.4	99.4	78.2	67.3	35.1
8 OPzS 800	281.6	219.8	182.0	151.1	132.2	103.4	89.7	46.8
10 OPzS 1000	352.2	274.5	226.7	188.9	166.0	129.2	112.3	58.3
12 OPzS 1200	421.8	329.2	272.5	226.7	198.8	156.0	134.2	70.0
12 OPzS 1500	518.3	411.8	342.1	291.3	257.5	208.7	174.0	85.2
16 OPzS 2000	691.5	549.1	455.5	388.8	344.0	278.3	231.6	115.1
20 OPzS 2500	864.6	689.3	571.8	486.2	429.5	347.9	290.2	143.2
24 OPzS 3000	1034.7	824.6	684.2	583.7	514.9	427.4	347.9	172.4

Type	Discharge time							
	2h	3h	4h	5h	6h	8h	10h	24h
3 OPzS 150	48.4	37.6	31.3	26.5	23.6	18.8	16.1	8.0
4 OPzS 200	64.5	50.1	41.8	35.4	31.4	25.0	21.5	10.6
5 OPzS 250	80.6	62.7	52.2	44.2	39.3	31.3	26.8	13.3
6 OPzS 300	96.7	75.2	62.7	53.1	47.1	37.6	32.2	15.9
5 OPzS 350	115.4	91.6	75.9	64.9	56.8	45.9	38.8	19.8
6 OPzS 420	138.3	110.4	91.0	77.9	68.2	55.2	46.5	23.6
7 OPzS 490	161.2	128.3	105.4	90.9	79.5	64.3	54.3	27.6
6 OPzS 600	194.0	155.2	129.3	109.4	96.9	77.5	65.6	34.5
8 OPzS 800	258.7	206.9	173.0	146.2	129.2	103.4	87.5	46.0
10 OPzS 1000	323.3	258.6	215.8	183.0	161.0	129.2	109.3	57.3
12 OPzS 1200	388.0	310.3	258.6	218.7	193.8	155.0	131.2	68.8
12 OPzS 1500	476.6	384.9	322.2	277.4	245.5	198.8	167.0	81.7
16 OPzS 2000	635.7	513.3	429.6	369.9	327.1	265.4	222.7	110.1
20 OPzS 2500	793.9	641.6	538.0	463.3	409.6	332.0	278.3	136.2
24 OPzS 3000	953.1	769.9	645.4	555.8	491.1	398.6	334.0	164.4

Performance Data Constant Current Discharge

Constant current discharge (in A) @ +20°C to the end-of-discharge voltage

Type	Discharge time							
	2h	3h	4h	5h	6h	8h	10h	24h
3 OPzS 150	45.5	35.7	29.9	25.5	22.7	18.2	15.7	7.8
4 OPzS 200	60.7	47.6	39.9	34.0	30.2	24.3	21.0	10.3
5 OPzS 250	75.9	59.5	49.8	42.5	37.8	30.3	26.1	13.0
6 OPzS 300	91.5	71.4	59.8	50.9	45.3	36.4	31.4	15.6
5 OPzS 350	108.4	87.5	72.8	62.7	55.0	44.4	37.4	19.1
6 OPzS 420	130.3	105.4	87.4	75.3	66.0	53.3	44.9	22.8
7 OPzS 490	152.2	122.3	101.4	87.8	77.0	62.2	52.4	26.6
6 OPzS 600	180.1	145.2	122.3	104.4	93.2	75.2	63.3	33.4
8 OPzS 800	239.8	193.0	163.1	139.2	124.3	100.4	84.4	44.5
10 OPzS 1000	300.5	240.7	202.9	174.0	155.1	125.2	105.4	55.4
12 OPzS 1200	360.2	289.5	243.7	208.8	185.9	150.1	126.2	66.5
12 OPzS 1500	438.8	358.1	301.3	261.5	231.6	188.8	158.0	77.6
16 OPzS 2000	585.0	477.5	401.8	349.0	309.2	252.5	211.7	104.0
20 OPzS 2500	731.3	596.8	503.2	435.5	385.7	315.1	264.4	129.3
24 OPzS 3000	876.5	716.2	603.7	523.0	463.3	378.7	317.1	155.7

Type	Discharge time									
	2h	3h	4h	5h	6h	8h	10h	24h	50h	100h
3 OPzS 150	43.3	34.2	28.9	24.8	22.1	17.7	15.3	7.5	4.0	2.1
4 OPzS 200	57.7	45.6	38.5	33.0	29.5	23.6	20.4	10.0	5.4	2.8
5 OPzS 250	72.1	57.0	48.0	41.3	36.9	29.4	25.5	14.5	6.7	3.5
6 OPzS 300	86.6	68.3	57.7	49.5	44.3	35.4	30.6	17.4	8.0	4.2
5 OPzS 350	103.5	83.5	69.8	60.4	53.1	43.0	36.2	20.2	9.9	5.2
6 OPzS 420	124.4	99.5	83.7	72.5	63.7	51.6	43.4	24.3	11.8	6.2
7 OPzS 490	145.3	116.4	97.8	84.5	74.4	60.2	50.7	28.4	13.8	7.3
6 OPzS 600	167.1	136.3	117.4	100.4	90.1	72.6	61.5	34.4	17.3	9.1
8 OPzS 800	222.9	182.0	156.1	134.2	120.3	96.7	82.0	45.9	23.0	12.2
10 OPzS 1000	278.6	226.8	193.9	166.0	149.1	120.3	101.4	57.2	28.6	15.2
12 OPzS 1200	334.3	273.5	233.7	199.9	178.9	144.1	122.3	68.5	34.4	18.2
12 OPzS 1500	407.9	335.2	283.4	245.6	218.7	179.9	151.1	85.5	40.3	21.7
16 OPzS 2000	544.2	446.6	377.9	327.1	291.3	239.5	201.8	114.0	53.8	29.0
20 OPzS 2500	680.5	558.0	471.4	409.7	364.8	300.2	252.5	142.0	67.1	36.2
24 OPzS 3000	815.8	669.4	565.9	491.2	437.4	359.8	303.2	171.0	80.6	43.5

Performance Data Constant Current Discharge

Constant current discharge (in A) @ +20°C to the end-of-discharge voltage

Uk=1.87 V/cell	Discharge time							
	2h	3h	4h	5h	6h	8h	10h	24h
3 OPzS 150	41.2	32.8	27.5	23.6	21.2	17.1	14.8	7.2
4 OPzS 200	54.9	43.8	36.7	31.5	28.2	22.9	19.8	9.6
5 OPzS 250	68.6	54.7	45.8	39.5	35.3	28.5	24.8	12.2
6 OPzS 300	82.4	65.7	55.0	47.3	42.3	34.2	29.7	14.6
5 OPzS 350	97.5	78.4	66.0	57.3	50.6	41.1	34.7	17.5
6 OPzS 420	117.4	94.1	79.3	68.8	60.7	49.4	41.6	20.9
7 OPzS 490	136.3	109.4	92.5	80.2	70.9	57.6	48.6	24.4
6 OPzS 600	156.2	128.3	110.4	95.8	85.0	68.3	58.5	31.0
8 OPzS 800	207.9	172.1	147.2	127.3	113.3	90.9	78.1	41.3
10 OPzS 1000	260.7	214.9	184.0	159.1	142.2	113.3	97.6	51.4
12 OPzS 1200	312.4	257.6	220.8	191.9	170.0	136.2	117.3	61.7
12 OPzS 1500	371.1	309.4	264.5	231.7	206.8	171.0	143.1	68.7
16 OPzS 2000	495.5	412.8	353.0	309.2	276.4	227.6	191.8	93.1
20 OPzS 2500	618.8	515.3	441.6	386.8	345.0	285.2	239.6	115.2
24 OPzS 3000	743.2	618.7	529.1	464.3	414.5	341.9	287.3	138.4

Uk=1.90 V/cell	Discharge time							
	2h	3h	4h	5h	6h	8h	10h	24h
3 OPzS 150	36.3	29.7	25.4	21.8	19.6	15.9	13.8	6.6
4 OPzS 200	48.4	39.6	33.8	29.1	26.1	21.2	18.4	8.8
5 OPzS 250	60.5	49.4	42.3	36.4	32.7	26.5	23.1	11.2
6 OPzS 300	72.5	59.4	50.7	43.7	39.3	31.8	27.6	13.4
5 OPzS 350	84.6	69.4	58.9	51.5	45.9	37.6	31.8	15.9
6 OPzS 420	101.5	83.3	70.7	61.8	55.1	45.1	38.2	18.9
7 OPzS 490	118.4	97.2	82.4	72.2	64.2	52.6	44.5	22.1
6 OPzS 600	135.3	112.4	98.0	85.3	76.2	62.4	53.9	28.3
8 OPzS 800	180.1	150.2	130.3	113.4	101.4	83.3	71.9	37.8
10 OPzS 1000	225.8	187.0	163.1	142.2	127.2	104.4	89.9	47.0
12 OPzS 1200	270.6	224.8	195.9	170.0	152.1	124.2	107.4	56.4
12 OPzS 1500	322.3	272.5	233.7	204.8	184.9	154.1	130.2	61.3
16 OPzS 2000	429.8	363.1	312.3	273.4	246.5	204.7	174.0	83.1
20 OPzS 2500	537.2	453.6	389.8	342.0	307.2	256.4	217.7	103.2
24 OPzS 3000	644.7	545.1	468.4	410.6	368.8	307.1	261.4	124.4

Performance Data Constant Power Discharge

Constant power discharge in W/Cell type @ +20°C to the end-of-discharge voltage

Uk=1.67 V/cell	Discharge time							
Type	2h	3h	4h	5h	6h	8h	10h	24h
3 OPzS 150	104.4	80.5	66.6	56.5	49.8	39.8	34.1	16.9
4 OPzS 200	139.2	107.3	88.8	75.3	66.3	53.1	45.5	22.6
5 OPzS 250	172.1	132.2	110.1	92.9	82.0	65.3	56.2	28.1
6 OPzS 300	207.4	159.0	131.6	111.6	98.9	78.7	67.8	33.9
5 OPzS 350	265.9	206.5	170.0	144.8	126.6	103.1	87.4	44.8
6 OPzS 420	321.4	248.2	204.7	174.9	153.2	124.6	105.3	53.7
7 OPzS 490	374.7	289.8	239.4	203.8	178.6	145.4	122.5	62.7
6 OPzS 600	440.7	340.7	284.3	237.6	210.4	167.0	144.2	74.3
8 OPzS 800	584.2	451.3	376.7	316.2	279.5	221.2	191.0	98.6
10 OPzS 1000	732.5	564.9	470.9	395.2	349.8	276.3	239.6	122.7
12 OPzS 1200	878.6	678.5	565.0	474.1	420.1	331.4	287.2	147.3
12 OPzS 1500	1026.3	803.8	665.8	571.2	503.7	410.1	342.8	169.1
16 OPzS 2000	1372.5	1071.8	889.1	762.9	673.1	548.0	457.4	227.9
20 OPzS 2500	1717.4	1339.7	1111.5	954.0	841.9	684.4	572.6	283.6
24 OPzS 3000	2054.3	1605.6	1332.4	1142.8	1009.7	819.3	685.5	341.3

Uk=1.70 V/cell	Discharge time							
Type	2h	3h	4h	5h	6h	8h	10h	24h
3 OPzS 150	97.7	75.3	62.4	52.9	46.6	37.3	32.0	15.9
4 OPzS 200	130.3	100.5	83.1	70.5	62.1	49.7	42.6	21.2
5 OPzS 250	163.2	125.3	104.4	88.1	77.7	61.9	53.3	26.7
6 OPzS 300	196.0	150.2	124.3	105.4	93.4	74.3	64.0	32.0
5 OPzS 350	231.8	180.0	148.2	126.3	110.3	89.8	76.2	39.1
6 OPzS 420	279.6	215.8	178.0	152.1	133.2	108.3	91.5	46.7
7 OPzS 490	325.3	251.7	207.9	177.0	155.1	126.2	106.4	54.5
6 OPzS 600	403.9	312.3	260.6	217.8	192.9	153.1	132.2	68.1
8 OPzS 800	538.2	415.8	347.1	291.3	257.5	203.7	175.9	90.9
10 OPzS 1000	674.5	520.2	433.6	363.9	322.1	254.4	220.7	113.0
12 OPzS 1200	808.9	624.7	520.1	436.5	386.7	305.1	264.4	135.6
12 OPzS 1500	1014.8	794.8	658.4	564.8	498.0	405.5	339.0	167.2
16 OPzS 2000	1354.1	1057.4	877.1	752.7	664.1	540.7	451.3	224.8
20 OPzS 2500	1693.3	1321.0	1095.9	940.6	830.1	674.9	564.6	279.6
24 OPzS 3000	2028.6	1585.6	1315.7	1128.5	997.1	809.0	676.9	337.1

Performance Data Constant Power Discharge

Constant power discharge in W/Cell type @ +20°C to the end-of-discharge voltage

Uk=1.75 V/cell	Discharge time							
	2h	3h	4h	5h	6h	8h	10h	24h
3 OPzS 150	94.8	73.6	61.2	52.0	45.9	37.5	31.6	15.6
4 OPzS 200	126.4	98.1	81.5	69.3	61.2	50.0	42.1	20.8
5 OPzS 250	158.2	122.3	101.4	86.6	76.5	61.2	52.7	26.3
6 OPzS 300	190.0	146.2	122.3	103.4	91.9	73.4	63.3	31.5
5 OPzS 350	227.8	177.1	147.2	125.3	109.4	89.2	75.7	38.7
6 OPzS 420	273.6	212.9	176.0	151.1	131.2	107.3	90.9	46.2
7 OPzS 490	319.4	248.7	204.9	176.0	153.1	125.2	106.4	53.9
6 OPzS 600	389.0	306.4	254.6	213.8	187.9	149.1	128.2	67.2
8 OPzS 800	519.3	408.8	340.1	284.4	250.5	197.8	171.0	89.5
10 OPzS 1000	649.7	511.3	424.7	356.0	313.1	246.5	213.7	111.9
12 OPzS 1200	780.0	612.7	510.2	427.5	376.8	296.2	257.4	133.6
12 OPzS 1500	957.1	767.9	640.5	548.9	487.1	397.6	332.0	163.1
16 OPzS 2000	1277.5	1023.5	854.3	732.8	650.1	529.7	443.3	219.7
20 OPzS 2500	1595.8	1284.2	1070.1	916.7	812.2	661.9	553.7	273.4
24 OPzS 3000	1910.2	1535.8	1281.9	1099.7	975.2	814.0	665.0	329.1

Uk=1.80 V/cell	Discharge time							
	Type	2h	3h	4h	5h	6h	8h	10h
3 OPzS 150	90.3	70.4	59.0	50.3	44.7	35.9	30.9	15.3
4 OPzS 200	120.4	93.9	78.7	67.0	59.5	47.9	41.2	20.4
5 OPzS 250	150.2	117.4	98.4	83.8	74.5	59.9	51.4	25.7
6 OPzS 300	180.1	141.2	118.3	100.4	89.4	71.9	61.6	30.8
5 OPzS 350	214.9	172.1	143.2	123.3	107.4	87.9	74.3	38.1
6 OPzS 420	257.7	205.9	172.0	147.2	129.2	105.4	89.1	45.6
7 OPzS 490	300.5	240.7	198.9	172.0	151.1	123.2	104.4	53.2
6 OPzS 600	361.1	291.4	243.7	207.8	183.9	148.1	125.2	66.5
8 OPzS 800	481.5	387.9	325.2	276.4	245.5	197.8	168.0	88.8
10 OPzS 1000	601.9	485.4	406.8	346.0	306.2	247.5	209.7	110.8
12 OPzS 1200	722.3	581.9	488.3	414.6	367.8	296.2	251.5	132.5
12 OPzS 1500	887.5	721.2	607.6	526.0	466.2	379.7	320.1	157.9
16 OPzS 2000	1182.9	961.9	809.5	701.0	621.3	506.9	426.4	212.4
20 OPzS 2500	1478.4	1202.6	1013.4	877.0	776.4	634.1	532.8	262.9
24 OPzS 3000	1774.9	1443.3	1216.3	1052.0	931.5	761.3	639.1	316.7

Performance Data Constant Power Discharge

Constant power discharge in W/Cell type @ +20°C to the end-of-discharge voltage

Uk=1.83 V/cell	Discharge time							
Type	2h	3h	4h	5h	6h	8h	10h	24h
3 OPzS 150	85.8	67.7	56.9	48.6	43.3	35.0	30.3	15.0
4 OPzS 200	114.4	90.2	75.9	64.8	57.8	46.7	40.5	20.0
5 OPzS 250	142.3	112.4	94.8	80.9	72.2	58.4	50.6	25.2
6 OPzS 300	171.1	135.3	113.4	96.9	86.6	70.1	60.7	30.1
5 OPzS 350	204.0	166.1	138.2	119.3	105.4	85.4	72.3	37.0
6 OPzS 420	244.7	198.9	166.1	143.2	126.3	102.4	86.8	44.2
7 OPzS 490	285.5	231.8	192.9	167.0	147.1	119.3	101.4	51.7
6 OPzS 600	338.3	273.5	231.7	199.9	177.9	145.1	122.3	64.9
8 OPzS 800	451.7	365.1	309.3	266.5	237.6	192.8	163.0	86.4
10 OPzS 1000	564.1	456.6	385.9	331.1	295.2	240.5	203.8	108.0
12 OPzS 1200	676.5	547.1	463.4	397.7	354.9	288.2	243.5	128.8
12 OPzS 1500	823.8	677.4	573.8	498.1	442.4	363.8	306.2	150.2
16 OPzS 2000	1098.4	903.2	765.8	664.2	589.5	486.0	408.5	202.9
20 OPzS 2500	1373.0	1130.0	956.7	830.2	736.6	607.3	510.9	250.8
24 OPzS 3000	1647.6	1355.8	1148.6	996.3	883.8	728.5	613.3	302.0

Uk=1.85 V/cell	Discharge time									
Type	2h	3h	4h	5h	6h	8h	10h	24h	50h	100h
3 OPzS 150	82.1	65.3	55.2	47.4	42.5	34.2	29.7	14.5	7.8	4.1
4 OPzS 200	109.4	87.0	73.6	63.2	56.7	45.6	39.6	19.4	10.4	5.5
5 OPzS 250	136.3	108.4	92.0	79.0	70.8	57.0	49.5	28.3	13.0	6.9
6 OPzS 300	163.2	130.3	110.4	94.9	84.9	68.5	59.4	34.0	15.5	8.3
5 OPzS 350	196.0	159.2	133.3	115.3	101.4	83.3	70.3	39.5	19.3	10.2
6 OPzS 420	234.8	191.0	160.1	139.2	122.3	100.4	84.3	47.4	22.9	12.1
7 OPzS 490	273.6	222.8	187.0	162.1	142.2	116.3	98.4	55.3	26.8	14.3
6 OPzS 600	316.4	260.6	223.8	192.9	173.0	140.1	119.3	67.2	33.7	17.8
8 OPzS 800	421.8	347.2	298.4	256.5	229.6	186.9	159.0	89.6	44.8	23.9
10 OPzS 1000	526.3	433.7	370.9	319.2	286.3	232.6	197.8	112.0	55.9	29.8
12 OPzS 1200	631.8	521.2	446.5	382.8	343.0	279.3	237.6	134.0	67.2	35.7
12 OPzS 1500	772.0	639.6	541.0	470.3	419.5	347.9	294.2	167.0	78.6	42.4
16 OPzS 2000	1028.7	852.5	722.0	627.4	558.7	464.2	392.6	222.0	104.7	56.5
20 OPzS 2500	1286.4	1065.3	902.0	784.5	698.9	580.4	490.0	278.0	131.4	70.8
24 OPzS 3000	1543.1	1278.2	1083.0	941.6	838.0	696.7	588.4	334.0	157.4	85.0

Performance Data Constant Power Discharge

Constant power discharge in W/Cell type @ +20°C to the end-of-discharge voltage

Uk=1.87 V/cell	Discharge time							
	2h	3h	4h	5h	6h	8h	10h	24h
3 OPzS 150	78.3	63.0	53.1	45.8	41.0	33.3	29.1	14.1
4 OPzS 200	104.5	84.1	70.8	61.1	54.7	44.4	38.8	18.9
5 OPzS 250	131.3	105.4	88.5	76.2	68.3	55.5	48.5	24.0
6 OPzS 300	157.2	126.3	106.4	91.6	82.0	66.6	58.1	28.7
5 OPzS 350	186.0	151.2	127.3	111.4	98.0	80.1	68.0	34.4
6 OPzS 420	222.9	181.0	152.2	133.2	117.3	96.2	81.6	41.0
7 OPzS 490	260.7	210.9	178.0	155.1	137.2	112.3	95.2	47.9
6 OPzS 600	298.5	247.7	213.8	184.9	165.0	133.2	114.3	60.8
8 OPzS 800	398.0	330.2	284.4	246.6	219.7	176.9	153.1	81.0
10 OPzS 1000	497.5	411.8	256.6	309.2	274.4	220.6	190.8	100.7
12 OPzS 1200	595.9	494.4	426.6	370.9	329.0	264.4	229.6	121.3
12 OPzS 1500	709.4	594.8	511.2	449.4	400.6	332.0	281.3	134.6
16 OPzS 2000	945.2	792.8	681.2	598.6	534.8	443.3	374.7	182.0
20 OPzS 2500	1181.9	991.7	851.3	748.7	668.0	553.6	469.2	226.2
24 OPzS 3000	1418.7	1189.7	1021.4	897.9	802.2	664.9	562.6	272.6

Uk=1.90 V/cell	Discharge time							
	2h	3h	4h	5h	6h	8h	10h	24h
3 OPzS 150	70.1	57.6	49.3	42.6	38.3	31.2	27.2	13.3
4 OPzS 200	93.4	76.8	65.7	56.8	51.1	41.5	36.3	17.7
5 OPzS 250	116.4	96.0	82.1	71.0	63.9	52.0	45.4	22.4
6 OPzS 300	140.3	115.4	98.6	85.1	76.7	62.4	54.5	26.9
5 OPzS 350	163.2	134.3	114.4	100.4	89.7	73.6	62.7	31.7
6 OPzS 420	196.0	161.1	137.2	120.3	107.4	88.4	75.2	37.8
7 OPzS 490	228.8	189.0	160.1	140.2	125.3	103.4	87.8	44.2
6 OPzS 600	261.7	217.8	189.9	166.0	149.1	122.2	106.4	56.6
8 OPzS 800	348.2	290.5	253.6	221.7	198.8	163.0	142.1	75.5
10 OPzS 1000	435.8	363.1	317.2	276.4	248.5	203.7	176.9	93.6
12 OPzS 1200	522.3	435.7	379.9	332.1	297.2	244.5	212.7	112.2
12 OPzS 1500	622.8	529.2	455.5	399.7	360.9	301.2	257.4	122.9
16 OPzS 2000	829.7	705.2	606.6	532.9	481.1	401.5	343.9	165.4
20 OPzS 2500	1037.7	881.3	758.8	666.2	601.4	501.9	429.4	205.6
24 OPzS 3000	1244.6	1057.4	910.0	799.4	721.7	602.3	515.9	248.0



LIVEN Series-LiFePO4

High performance, completely maintenance-free, low self-discharge.
Floating & standby use: up to 10 years @25°C.
100% precise quality testing, stable quality and high reliable performance.
Uniform output voltage in all the discharge curve.
Provide full nominal capacity, even at high currents.
Energy density: up to 130Wh/kg.
Capacity density: up to 145Ah/kg.
Suitable for standby power and energy storage power use.
Long storage time.
Cycle use: Up to 4500 cycles @25°C.

Application:

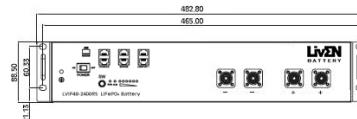
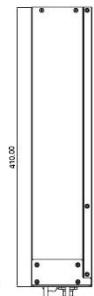
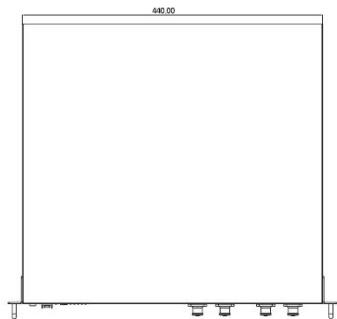
- Telecommunications
- Uninterrupted Power Supply (UPS)
- DC Power Supply
- Electric Power System (EPS)
- Power Plants FV
- Wind Power Supply

Dimensions:

Length	442±3mm (17.40in)
Width	420±3mm (16.54in)
Height	(2U) 88.5±3mm (3.48in)



Outer Dimensions:



⁽¹⁾ When the environment temperature is higher than 45°C, please pay attention to ventilation and heat rejection.

⁽²⁾ When humidity is higher than 85%, pay attention to protect, easily oxidized components note sealed.

⁽³⁾ OVP=Over charge protection; UVP=Over discharge protection; SC=Short-circuit; TEMP=Temp. levels protection; BF=Balanced Function; COM=Communication Function

Specification:

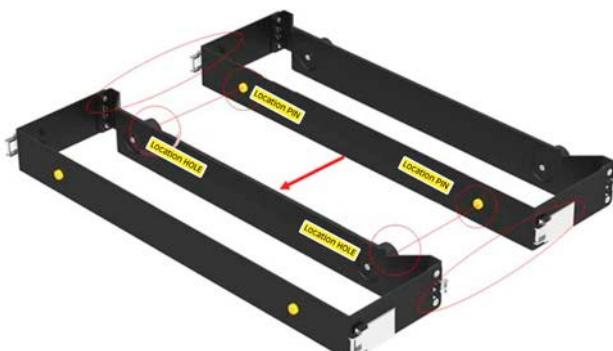
Nominal Voltage	48.0V
Nominal Capacity	50.0Ah @0.2C @25°C
Weight	Approx. 24Kg ±1kg (52.91lbs)
Energy	2,400.0Wh @0.2C @25°C
Usable Energy	2,200.0Wh @0.2C @25°C
Discharge	
Normal Current	25A
Maximum Current	50A
Peak Current	100A @15s
Nominal Float Voltage	48.0V ±0.2V
Cut-Off Voltage	45.0V ±0.2V
Charge	
Charge Voltage Range	52.5~54.0V ±0.2V
Charge Current	≤ 25A
Maximum Current	50A
Peak Current	100A @15s
Charge Mode	CC/CV, use special LiFePO ₄ Charger
Operation Temperature Range ¹	Discharge: -10°C~50°C Charge: 0°C~50°C
Storage Temperature Range	-20°C~60°C 15°C~30°C (Long term storage) (Capacity 80%)
Humidity Range ¹	Charge/Discharge: RH= 85% ² Storage: RH= 50% ²
BP Protection - BMS Features ³	OVP, UVP, SC, TEMP, BF, COM
Battery Communications	RS485, CAN, MOD BUS Protocol (Optional), Other available
Parallel Connection	
N. Modules	≤8 modules (max. in 1 Battery group)
Before Connect	The Voltage difference between each unit should be ≤ 0.3V
After Connect	Current should be less than working Current of any module
Cooling type	Natural Cooling
IP Rating	IP20
Certifications	UN38.3, CE, IEC62619, IEC62040, IEC62477, IEC61000

Battery Front Interface



- | | |
|---------------------|---------------------------|
| (1) SOC | (7) ADD |
| (2) Alarm | (8) Dry Contact / Console |
| (3) Run | (9) A/B RS485 |
| (4) Start | (10) Link Port 0/1 |
| (5) Power Switch | (11) Power Terminals (-) |
| (6) Grounding Point | (12) Power Terminals (+) |

Installation proposal with Brackets



(Note) All above information shall be changed without prior notice. LIVEN Battery reserves the right to explain and update the latest information.