

OPzS

Lead Selenium Tubular Plate Battery



Lead Selenium Tubular Plate Battery

The Mesa OPzS is a range of lead selenium tubular plate lead-acid batteries in cell and block format (conforming to DIN 40736 (1) for the cells and 40737-3 and 40744 for the blocks). They are ideal for use in the broadest range of stationary DC power supply installations. The combination of lead-selenium alloy with tubular plate construction creates the longest service life lead alloy battery in the world. The OPzS has a 20-year float life, and is rated for more than 1,500 deep discharge cycles to 80% DoD. Capacity ranges from 100 to 3,200 amp-hr.



Applications

- » Utility switchgear
- » Telecommunications
- » UPS units
- » Power plants & substations
- » Process control
- » Emergency backup power

Specifications

- » Float Voltage: 2.23 to 2.25 VPC
- » Equalize Voltage: 2.35 to 2.40 VPC
- » Specific Gravity: 1.240 kg/L @ 77°F
- » Styrene Acrylonitrile (SAN) jar & cover
- » Flame retardant UL VO 94 available upon special order



OPzS | Lead Selenium Tubular Plate Battery



Standard Accessories for OPzS Batteries

- » Battery inter-cell and inter-row connections
- » Terminal hardware
- » Hydrometer with holder and drip cup
- » Vent mounted thermometer
- » Cell numbers
- » Lifting strap
- » Flame arresting vent caps
- » No-ox or similar grease
- » Installation and operating instructions & drawings
- » Connectors: lead-coated copper bar
- » Connection hardware: stainless steel
- » Terminals: M10 threaded copper insert

Tubular Plate Design

- » Excellent high rate performance
- » Long life with maximum reliability
- » Deep discharge capability (>1,500 cycles)
- » Stable float charge characteristics
- » Space saving footprint
- » Ideal for substation loads

Clear Jars

- » Impact-resistant, clear Styrene Acrylonitrile (SAN) jars
- » Provides crystal clear viewing of the cell plates, bridges and electrolyte
- » Easy inspection of cell condition and electrolyte level

Robust & Compact

- » Lead selenium alloy is corrosion resistant and reduces plate growth
- » Leak proof, tongue-in-groove jar-cover seals
- » Minimizes seal failures and container & cover cracks
- » O-ring compression seals reduce leaks, connection corrosion, and mechanical failures
- » Reduced maintenance & reduced footprint

Optimized Connector System - B-OPzS Blocks

- » Fully insulated connector with test points for ohmic and voltage measurements
- » Reduces terminal connection maintenance
- » External welded connections between individual cells allow for testing individual cell voltages, internal resistance or conductance, and monitoring individual cells during load testing



OPzS – Lead Selenium Tubular Plate Cells



B-OPzS – Lead
Selenium Tubular
Plate Battery Multi-
Cell Blocks



OPzS

Lead Selenium
Tubular Plate Battery

SPECIFICATIONS

Type	Nominal Voltage	Capacity*	r _i mOhm	I _{sc} kA	Dimensions (in.)			Weight (lbs.)		Electrolyte		No. of Terminals
					Length	Width	Height	Filled	Dry	Weight	Volume*	
OPzS 100	2	109	1.55	1.29	4.1	8.1	17.0	35.7	21.4	14.3	1.4	2
OPzS 150	2	164	1.03	1.94	4.1	8.1	17.0	38.4	26.7	11.7	1.1	2
OPzS 200	2	218	0.78	2.58	4.1	8.1	17.0	41.0	32.0	9.0	0.9	2
OPzS 250	2	272	0.62	3.23	4.9	8.1	17.0	49.2	37.7	11.5	1.1	2
OPzS 300	2	327	0.52	3.87	5.7	8.1	17.0	57.1	43.4	13.7	1.3	2
OPzS 350	2	385	0.57	3.48	4.9	8.1	21.6	64.6	48.1	16.5	1.6	2
OPzS 420	2	461	0.48	4.17	5.7	8.1	21.6	76.1	56.2	19.8	1.9	2
OPzS 490	2	538	0.41	4.87	6.5	8.1	21.6	86.9	64.8	22.0	2.1	2
OPzS 600	2	653	0.44	4.53	5.7	8.3	29.0	104.9	77.6	27.3	2.6	2
OPzS 700	2	761	0.38	5.29	8.3	7.5	29.0	123.7	91.1	32.6	3.1	4
OPzS 800	2	870	0.33	6.04	8.3	7.5	29.0	140.9	104.5	36.4	3.5	4
OPzS 900	2	979	0.29	6.80	8.3	9.2	29.0	157.0	115.1	42.1	4.1	4
OPzS 1000	2	1087	0.26	7.55	8.3	9.2	29.0	175.3	129.0	45.2	4.4	4
OPzS 1100	2	1196	0.24	8.31	8.3	10.8	29.0	185.4	135.1	50.3	4.9	4
OPzS 1200	2	1305	0.22	9.06	8.3	10.8	29.0	199.1	144.8	54.2	5.2	4
OPzS 1500	2	1683	0.27	7.93	8.3	10.8	34.9	249.6	188.7	60.8	5.9	4
OPzS 1625	2	1824	0.25	8.59	8.4	15.7	33.9	276.0	210.1	65.9	6.4	6
OPzS 1750	2	1964	0.23	9.25	8.4	15.7	33.9	302.7	228.8	73.9	7.1	6
OPzS 1875	2	2104	0.22	9.91	8.4	15.7	33.9	325.0	241.6	83.3	8.1	6
OPzS 2000	2	2244	0.2	10.57	8.4	15.7	33.9	345.2	257.9	87.3	8.4	6
OPzS 2500	2	2806	0.16	13.21	8.3	19.2	33.9	433.0	323.4	109.6	10.6	8
OPzS 3000	2	3367	0.14	15.86	8.3	22.7	33.9	506.4	368.6	137.8	13.3	8
OPzS block 12/50	12	50	16.64	0.72	10.7	8.1	15.6	94.6	68.6	26.0	2.5	2
OPzS block 12/100	12	101	9.44	1.27	10.7	8.1	15.6	116.4	91.3	25.1	2.4	2
OPzS block 12/150	12	151	6.57	1.83	15.0	8.1	15.6	159.4	126.1	33.3	3.2	2
OPzS block 6/200	6	202	2.78	2.20	10.7	8.1	15.6	111.8	84.9	26.9	2.6	2
OPzS block 6/250	6	252	2.22	2.75	15.0	8.1	15.6	153.2	119.0	34.2	3.3	2
OPzS block 6/300	6	303	1.85	3.30	15.0	8.1	15.6	163.8	131.2	32.6	3.1	2

*Nominal 8-hr Ah Capacity at 77°F to 1.75 VPC. **Electrolyte Volume in Gallons.

OPzS

Lead Selenium
Tubular Plate Battery

DISCHARGE DATA (A) to 1.70 VPC at 25°C

Type	DISCHARGE TIME (Minutes)					DISCHARGE TIME (Hours)											
	1	5	10	15	30	1	2	3	5	8	10	20	24	100	120	240	
2 OPzS 100	149.7	134.8	118.7	106.2	80.5	56.9	37.4	28.5	19.7	13.9	11.7	6.7	5.8	1.6	1.4	0.7	
3 OPzS 150	224.6	202.2	178.0	159.2	120.9	85.3	56.2	42.6	29.6	20.8	17.5	10.1	8.7	2.4	2.1	1.1	
4 OPzS 200	299.5	269.6	237.3	212.3	161.1	113.7	74.9	56.9	39.4	27.7	23.4	13.5	11.6	3.2	2.7	1.4	
5 OPzS 250	374.3	337.1	296.6	265.3	201.4	142.2	93.6	71.1	49.2	34.7	29.3	16.9	14.5	4.1	3.4	1.7	
6 OPzS 300	449.2	404.5	356.0	318.4	241.6	170.6	112.2	85.3	59.1	41.6	35.1	20.2	17.5	4.9	4.1	2.1	
5 OPzS 350	540.8	486.2	430.0	382.7	285.6	201.1	131.1	100.3	69.8	49.4	41.8	24.6	21.3	6.3	5.4	2.8	
6 OPzS 420	648.9	583.4	516.0	459.3	342.7	241.3	157.4	120.3	83.8	59.2	50.2	29.5	25.6	7.6	6.5	3.3	
7 OPzS 490	757.1	680.6	602.0	535.8	399.8	281.5	183.6	140.4	97.8	69.1	58.5	34.4	29.8	8.8	7.6	3.9	
6 OPzS 600	886.7	845.8	591.6	544.6	445.3	329.8	221.2	169.4	118.9	83.8	70.9	40.5	35.1	10.5	9.0	4.6	
7 OPzS 700	1012.7	753.4	690.2	635.5	519.5	384.7	258.1	197.5	138.7	97.8	82.7	47.2	41.0	12.3	10.5	5.4	
8 OPzS 800	915.6	861.0	788.8	726.2	593.7	439.7	294.9	225.8	158.6	111.7	94.6	54.0	46.9	14.0	12.0	6.1	
9 OPzS 900	1030.1	968.6	887.4	817.0	667.9	494.7	331.8	254.0	178.3	125.7	106.4	60.7	52.7	15.8	13.5	6.9	
10 OPzS 1000	1144.5	1076.3	986.0	907.7	742.1	549.7	368.7	282.2	198.1	139.7	118.2	67.5	58.6	17.5	15.0	7.7	
11 OPzS 1100	1259.0	1183.9	1084.5	998.6	816.4	604.6	405.5	310.4	218.0	153.6	130.0	74.2	64.4	19.3	16.5	8.4	
12 OPzS 1200	1373.4	1291.5	1183.1	1089.3	890.6	659.6	442.4	338.6	237.7	167.6	141.9	80.9	70.3	21.0	18.0	9.2	
12 OPzS 1500	1508.2	1438.9	1346.9	1264.6	1064.4	819.0	568.5	438.6	303.9	214.1	180.2	103.3	89.8	26.1	22.2	11.3	
13 OPzS 1625	1633.9	1558.8	1459.2	1369.9	1153.0	887.3	615.8	475.2	329.2	231.9	195.2	111.9	97.3	28.3	24.0	12.2	
14 OPzS 1750	1759.6	1678.7	1571.4	1475.4	1241.7	955.5	663.2	511.8	354.5	249.8	210.2	120.5	104.7	30.4	25.9	13.2	
15 OPzS 1875	1885.3	1798.7	1683.7	1580.8	1330.5	1023.8	710.5	548.3	379.8	267.6	225.2	129.2	112.2	32.6	27.7	14.1	
16 OPzS 2000	2011.0	1918.6	1795.9	1686.1	1419.1	1092.0	757.9	584.9	405.1	285.5	240.2	137.8	119.7	34.8	29.5	15.1	
20 OPzS 2500	2513.7	2398.2	2244.9	2107.7	1773.9	1365.0	947.4	731.0	506.4	356.8	300.3	172.2	149.6	43.5	36.9	18.8	
24 OPzS 3000	3016.4	2877.8	2693.9	2529.2	2128.7	1638.0	1136.9	877.3	607.6	428.2	360.4	206.6	179.6	52.2	44.3	22.6	
OPzS block 12/50	74.1	64.5	55.7	49.1	37.3	26.4	17.3	13.1	9.1	6.4	5.5	3.1	2.7	0.8	0.7	0.3	
OPzS block 12/100	148.3	128.9	111.3	98.3	74.7	52.7	34.7	26.4	18.3	12.8	10.8	6.2	5.4	1.5	1.3	0.7	
OPzS block 12/150	222.4	193.4	167.0	147.4	111.9	79.0	52.0	39.5	27.4	19.2	16.3	9.3	8.0	2.3	2.0	1.0	
OPzS block 6/200	296.5	257.9	222.6	196.7	149.2	105.3	69.3	52.7	36.5	25.7	21.6	12.4	10.7	3.0	2.6	1.3	
OPzS block 6/250	370.7	322.4	278.3	245.8	186.6	131.7	86.7	65.8	45.7	32.1	27.1	15.5	13.4	3.8	3.3	1.7	
OPzS block 6/300	444.8	386.8	333.9	294.9	223.9	158.0	104.1	79.0	54.8	38.5	32.6	18.6	16.1	4.6	4.0	2.0	

DISCHARGE DATA (A) to 1.75 VPC at 25°C

Type	DISCHARGE TIME (Minutes)					DISCHARGE TIME (Hours)											
	1	5	10	15	30	1	2	3	5	8	10	20	24	100	120	240	
2 OPzS 100	123.9	114.7	104.0	95.6	75.8	54.5	36.4	27.8	19.4	13.7	11.6	6.7	5.8	1.6	1.4	0.7	
3 OPzS 150	185.9	172.0	155.9	143.3	113.7	81.7	54.7	41.8	29.2	20.5	17.3	10.0	8.6	2.4	2.0	1.0	
4 OPzS 200	247.8	229.3	207.9	191.1	151.6	109.0	73.0	55.7	38.9	27.2	23.1	13.3	11.5	3.2	2.7	1.4	
5 OPzS 250	309.8	286.7	259.9	238.9	189.5	136.2	91.2	69.6	48.6	34.0	28.9	16.7	14.4	4.0	3.4	1.7	
6 OPzS 300	371.7	344.0	311.9	286.7	227.4	163.5	109.4	83.5	58.3	40.8	34.7	20.0	17.3	4.8	4.1	2.1	
5 OPzS 350	409.5	381.7	349.1	320.3	256.7	186.9	125.5	96.6	67.7	48.1	40.7	23.9	20.8	6.2	5.3	2.7	
6 OPzS 420	491.4	458.0	419.0	384.3	308.1	224.3	150.6	115.9	81.3	57.6	48.8	28.7	25.0	7.4	6.4	3.2	
7 OPzS 490	573.3	534.3	488.8	448.4	359.4	261.7	175.7	135.2	94.8	67.3	57.0	33.5	29.2	8.7	7.4	3.8	
6 OPzS 600	557.6	530.5	497.7	468.4	395.2	304.5	209.7	163.5	115.0	81.6	69.1	39.8	34.6	10.4	8.8	4.5	
7 OPzS 700	650.5	618.9	580.7	546.4	461.1	355.2	244.7	190.8	134.1	95.1	80.6	46.4	40.3	12.1	10.2	5.2	
8 OPzS 800	743.4	707.3	663.6	624.5	526.9	405.9	279.6	218.0	153.3	108.8	92.2	53.0	46.1	13.8	11.7	6.0	
9 OPzS 900	836.3	795.7	746.6	702.6	592.8	456.8	314.6	245.3	172.4	122.3	103.6	59.6	51.9	15.5	13.2	6.7	
10 OPzS 1000	929.3	884.1	829.5	780.7	658.7	507.5	349.5	272.6	191.6	135.9	115.2	66.3	57.6	17.3	14.6	7.5	
11 OPzS 1100	1022.2	972.5	912.5	858.7	724.5	558.2	384.5	299.8	210.7	149.5	126.7	72.9	63.4	19.0	16.1	8.2	
12 OPzS 1200	1115.1	1060.9	995.4	936.8	790.3	608.9	419.5	327.1	230.0	163.1	138.2	79.5	69.2	20.7	17.6	9.0	
12 OPzS 1500	1247.4	1198.3	1135.3	1079.7	928.8	735.3	522.5	412.9	295.2	210.4	177.0	101.6	88.2	25.6	21.8	11.1	
13 OPzS 1625	1351.4	1298.1	1229.9	1169.7	1006.3	796.6	566.1	447.2	319.7	228.0	191.8	110.0	95.5	27.8	23.6	12.0	
14 OPzS 1750	1455.3	1398.0	1324.5	1259.7	1083.7	858.0	609.5	481.6	344.3	245.5	206.5	118.5	102.9	29.9	25.4	13.0	
15 OPzS 1875	1559.3	1497.8	1419.1	1349.7	1161.1	919.2	653.1	516.1	368.9	263.0	221.3	126.9	110.2	32.0	27.2	13.9	
16 OPzS 2000	1663.2	1597.7	1513.7	1439.6	1238.5	980.5	696.7	550.4	393.4	280.6	236.0	135.4	117.6	34.2	29.0	14.8	
20 OPzS 2500	2079.0	1997.1	1892.1	1799.5	1548.1	1225.6	870.9	688.1	491.8	350.7	295.2	169.3	146.9	42.7	36.3	18.5	
24 OPzS 3000	2494.8	2396.5	2270.5	2159.4	1857.8	1470.7	1045.0	825.6	590.2	420.8	354.2	203.1	176.3	51.2	43.6	22.2	
OPzS block 12/50	60.9	54.7	48.8	44.1	35.1	25.2	16.9	13.0	9.0	6.3	5.4	3.1	2.7	0.8	0.7	0.3	
OPzS block 12/100	121.8	109.4	97.7	88.2	70.2	50.5	33.8	26.0	18.1	12.6	10.7	6.2	5.3	1.5	1.3	0.7	
OPzS block 12/150	182.7	164.1	146.5	132.3	105.3	75.7	50.7	39.1	27.1	18.9	16.1	9.3	8.0	2.3	2.0	1.0	
OPzS block 6/200	243.6	218.8	195.3	176.4	140.5	100.9	67.6	52.1	36.1	25.2	21.4	12.3	10.7	3.0	2.6	1.3	
OPzS block 6/250	304.5	273.5	244.1	220.5	175.6	126.2	84.5	65.1	45.3	31.5	26.8	15.4	13.3	3.8	3.3	1.7	
OPzS block 6/300	365.4	328.2	293.0	264.6	210.6	151.4	101.4	78.1	54.3	37.9	32.1	18.5	16.0	4.6	3.9	2.0	

OPzS

Lead Selenium
Tubular Plate Battery

DISCHARGE DATA (A) to 1.80 VPC at 25°C

Type	DISCHARGE TIME (Minutes)					DISCHARGE TIME (Hours)										
	1	5	10	15	30	1	2	3	5	8	10	20	24	100	120	240
2 OPzS 100	109.4	102.3	94.3	86.8	70.1	51.7	34.9	26.9	18.9	13.3	11.3	6.5	5.6	1.6	1.3	0.7
3 OPzS 150	164.1	153.4	141.4	130.2	105.2	77.5	52.3	40.3	28.2	20.1	17.0	9.8	8.5	2.4	2.0	1.0
4 OPzS 200	218.8	204.5	188.6	173.6	140.3	103.3	69.6	53.7	37.7	26.7	22.7	13.1	11.3	3.2	2.6	1.4
5 OPzS 250	273.5	255.7	235.7	217.0	175.4	129.2	87.0	67.1	47.1	33.4	28.4	16.3	14.1	3.9	3.3	1.7
6 OPzS 300	328.2	306.8	282.9	260.4	210.4	155.0	104.5	80.5	56.6	40.0	34.0	19.6	16.9	4.7	4.0	2.0
5 OPzS 350	309.8	290.3	266.7	247.3	206.5	161.0	115.2	90.8	65.3	46.5	39.6	23.3	20.3	6.1	5.1	2.6
6 OPzS 420	371.7	348.4	320.0	296.7	247.8	193.1	138.3	108.9	78.4	55.8	47.5	28.0	24.4	7.3	6.2	3.2
7 OPzS 490	433.7	406.5	373.4	346.2	289.1	225.3	161.3	127.1	91.5	65.1	55.4	32.6	28.4	8.5	7.2	3.7
6 OPzS 600	434.7	415.8	395.6	376.0	329.5	264.4	192.5	152.9	109.1	78.5	67.0	38.5	33.5	10.0	8.5	4.3
7 OPzS 700	507.2	485.1	461.6	438.7	384.4	308.5	224.6	178.4	127.3	91.7	78.2	44.9	39.0	11.7	9.9	5.1
8 OPzS 800	579.6	554.4	527.5	501.4	439.3	352.6	256.6	203.8	145.4	104.8	89.4	51.3	44.6	13.3	11.4	5.8
9 OPzS 900	652.1	623.7	593.5	564.1	494.2	396.6	288.8	229.3	163.6	117.8	100.6	57.7	50.2	15.0	12.8	6.5
10 OPzS 1000	724.5	693.0	659.4	626.7	549.2	440.7	320.8	254.8	181.9	130.9	111.7	64.1	55.7	16.7	14.2	7.2
11 OPzS 1100	797.0	762.3	725.3	689.3	604.1	484.8	352.9	280.2	200.0	144.1	122.9	70.5	61.3	18.4	15.6	8.0
12 OPzS 1200	869.4	831.6	791.3	752.0	659.0	528.9	384.9	305.8	218.2	157.1	134.1	76.9	66.9	20.0	17.0	8.7
12 OPzS 1500	1006.7	971.5	928.8	890.2	793.4	648.3	478.9	387.0	278.7	199.4	170.3	97.8	85.0	24.7	20.9	10.7
13 OPzS 1625	1090.6	1052.4	1006.3	964.3	859.5	702.3	518.9	419.3	301.9	216.1	184.5	105.9	92.1	26.8	22.7	11.6
14 OPzS 1750	1174.5	1133.4	1083.7	1038.6	925.7	756.3	558.8	451.5	325.1	232.7	198.7	114.1	99.1	28.8	24.4	12.5
15 OPzS 1875	1258.4	1214.3	1161.1	1112.7	991.7	810.4	598.7	483.8	348.3	249.3	212.8	122.2	106.2	30.9	26.2	13.4
16 OPzS 2000	1342.3	1295.3	1238.5	1186.9	1057.9	864.4	638.6	516.1	371.6	265.9	227.0	130.4	113.3	32.9	27.9	14.2
20 OPzS 2500	1677.9	1619.1	1548.1	1483.7	1322.4	1080.5	798.2	645.0	464.4	332.3	283.8	162.9	141.6	41.1	34.9	17.8
24 OPzS 3000	2013.5	1942.9	1857.8	1780.4	1586.9	1296.5	957.9	774.1	557.3	398.8	340.6	195.5	170.0	49.4	41.9	21.4
OPzS block 12/50	52.7	48.3	43.9	40.2	32.4	23.9	16.2	12.4	8.7	6.2	5.3	3.0	2.6	0.8	0.6	0.3
OPzS block 12/100	105.3	96.6	87.7	80.4	65.0	47.9	32.2	24.9	17.4	12.3	10.5	6.1	5.2	1.5	1.3	0.7
OPzS block 12/150	158.0	145.0	131.6	120.6	97.4	71.7	48.4	37.3	26.3	18.5	15.8	9.1	7.9	2.3	1.9	1.0
OPzS block 6/200	210.6	193.3	175.4	160.9	129.9	95.7	64.5	49.8	35.0	24.7	21.0	12.1	10.5	3.0	2.6	1.3
OPzS block 6/250	263.3	241.6	219.2	201.0	162.4	119.6	80.6	62.2	43.7	30.9	26.3	15.1	13.1	3.8	3.2	1.6
OPzS block 6/300	316.1	289.9	263.0	241.2	194.9	143.5	96.8	74.7	52.4	37.0	31.5	18.2	15.7	4.6	3.8	2.0

DISCHARGE DATA (A) to 1.85 VPC at 25°C

Type	DISCHARGE TIME (Minutes)					DISCHARGE TIME (Hours)										
	1	5	10	15	30	1	2	3	5	8	10	20	24	100	120	240
2 OPzS 100	84.0	80.2	75.4	71.0	59.7	46.0	31.7	25.0	17.9	12.7	10.8	6.3	5.4	1.5	1.3	0.6
3 OPzS 150	126.0	120.3	113.1	106.5	89.6	69.0	47.7	37.4	26.8	19.0	16.2	9.4	8.1	2.3	1.9	1.0
4 OPzS 200	168.0	160.4	150.8	142.0	119.4	91.9	63.5	49.9	35.6	25.3	21.6	12.5	10.8	3.0	2.5	1.3
5 OPzS 250	210.0	200.6	188.5	177.5	149.2	114.9	79.4	62.4	44.5	31.7	27.0	15.6	13.5	3.8	3.2	1.6
6 OPzS 300	252.0	240.7	226.2	212.9	179.1	137.9	95.2	74.9	53.4	38.0	32.4	18.8	16.2	4.5	3.8	1.9
5 OPzS 350	250.4	236.3	218.9	204.4	173.3	136.5	95.5	80.3	60.2	44.1	37.8	22.6	19.6	5.9	4.9	2.5
6 OPzS 420	300.5	283.5	262.7	245.4	207.9	163.8	119.4	96.4	72.2	52.9	45.4	27.1	23.6	7.1	5.9	3.0
7 OPzS 490	350.6	330.8	306.5	286.2	242.6	191.1	139.3	112.5	84.2	61.7	52.9	31.6	27.5	8.2	6.9	3.5
6 OPzS 600	332.4	323.2	311.2	299.3	267.8	223.7	168.5	137.4	100.3	73.6	62.9	36.7	31.9	9.5	8.0	4.1
7 OPzS 700	387.8	377.1	363.1	349.1	312.4	260.9	196.7	160.3	117.0	85.9	73.3	42.8	37.2	11.1	9.3	4.7
8 OPzS 800	443.2	430.9	415.0	399.0	357.0	298.2	224.7	183.2	133.8	98.2	83.8	48.9	42.5	12.7	10.6	5.4
9 OPzS 900	498.5	484.8	468.8	448.9	401.6	335.5	252.8	206.1	150.5	110.5	94.3	55.0	47.8	14.3	12.0	6.1
10 OPzS 1000	554.0	538.7	518.7	498.8	446.3	372.8	280.9	229.0	167.2	122.7	104.8	61.1	53.1	15.9	13.3	6.8
11 OPzS 1100	609.4	592.5	570.6	548.6	490.9	410.0	309.0	251.9	183.9	135.0	115.2	67.2	58.4	17.5	14.6	7.5
12 OPzS 1200	664.8	646.4	622.4	598.5	535.5	447.3	337.1	274.8	200.6	147.3	125.7	73.3	63.8	19.1	16.0	8.1
12 OPzS 1500	778.7	756.0	729.5	705.6	638.8	541.8	413.6	335.5	247.7	178.9	152.5	89.9	78.0	22.8	18.8	9.6
13 OPzS 1625	843.6	819.0	790.3	764.4	692.1	587.0	448.1	363.4	268.4	193.8	165.2	97.4	84.5	24.7	20.3	10.4
14 OPzS 1750	908.5	882.0	851.1	823.2	745.3	632.1	482.6	391.3	289.0	208.7	177.9	104.8	91.0	26.6	21.9	11.2
15 OPzS 1875	973.4	945.0	911.9	882.0	798.5	677.4	517.0	419.3	309.6	223.7	190.6	112.3	97.5	28.5	23.4	12.0
16 OPzS 2000	1038.2	1008.0	972.7	940.8	851.8	722.5	551.6	447.2	330.2	238.6	203.3	119.8	104.0	30.4	25.0	12.7
20 OPzS 2500	1297.8	1260.0	1215.9	1176.0	1064.7	903.1	688.4	559.0	412.9	298.2	254.1	149.8	130.0	38.0	31.3	15.9
24 OPzS 3000	1557.4	1512.0	1459.1	1411.2	1277.6	1083.7	827.3	670.8	495.4	357.8	304.9	179.7	156.0	45.6	37.5	19.1
OPzS block 12/50	40.1	37.9	35.2	33.0	27.6	21.3	14.7	11.6	8.3	5.8	4.9	2.9	2.5	0.7	0.6	0.3
OPzS block 12/100	80.2	75.8	70.4	65.8	55.3	42.5	29.4	23.1	16.5	11.7	9.9	5.8	5.0	1.4	1.2	0.6
OPzS block 12/150	120.3	113.7	105.4	98.8	83.0	63.8	44.1	34.7	24.8	17.4	14.8	8.7	7.5	2.2	1.8	0.9
OPzS block 6/200	160.4	151.7	140.6	131.7	110.6	85.2	58.8	46.2	33.0	23.2	19.7	11.6	10.0	2.9	2.4	1.2
OPzS block 6/250	200.6	189.6	175.8	164.6	138.3	106.5	73.5	57.8	41.3	29.1	24.7	14.5	12.5	3.6	3.0	1.5
OPzS block 6/300	240.7	227.5	210.9	197.5	165.9	127.7	88.2	69.3	49.6	34.9	29.6	17.4	14.9	4.3	3.6	1.8

OPzS

Lead Selenium
Tubular Plate Battery

DISCHARGE DATA (W) to 1.70 VPC at 25°C

Type	DISCHARGE TIME (Minutes)					DISCHARGE TIME (Hours)									
	1	5	10	15	30	1	2	3	5	8	10	20	24	100	
2 OPzS 100	261.2	238.0	211.9	191.7	147.2	105.1	69.9	53.8	37.7	26.8	22.8	13.3	11.6	3.3	
3 OPzS 150	392.0	357.1	317.9	287.7	220.8	157.6	104.9	80.5	56.5	40.1	34.2	19.9	17.4	4.9	
4 OPzS 200	522.6	476.1	423.9	383.6	294.4	210.1	139.9	107.4	75.3	53.6	45.7	26.6	23.2	6.5	
5 OPzS 250	653.2	595.1	529.8	479.4	368.0	262.7	174.8	134.3	94.1	66.9	57.1	33.2	29.0	8.1	
6 OPzS 300	783.8	714.1	635.8	575.3	441.6	315.2	209.8	161.2	113.0	80.2	68.5	39.9	34.8	9.8	
5 OPzS 350	943.6	858.4	768.1	691.5	522.0	371.6	245.1	189.4	133.4	95.2	81.6	48.4	42.5	12.7	
6 OPzS 420	1132.4	1030.1	921.7	829.8	626.3	445.9	294.1	227.3	160.0	114.3	97.9	58.1	51.0	15.2	
7 OPzS 490	1321.1	1201.7	1075.3	968.1	730.7	520.3	343.1	265.2	186.7	133.4	114.1	67.8	59.5	17.8	
6 OPzS 600	1198.4	1140.2	1056.7	984.1	813.8	609.4	413.4	319.9	227.0	161.7	138.4	79.8	70.0	21.2	
7 OPzS 700	1398.1	1330.2	1232.8	1148.1	949.4	711.1	482.3	373.2	264.9	188.7	161.4	93.1	81.7	24.7	
8 OPzS 800	1597.8	1520.3	1409.0	1312.1	1085.0	812.6	551.1	426.5	302.7	215.7	184.5	106.4	93.3	28.2	
9 OPzS 900	1797.5	1710.2	1585.1	1476.1	1220.6	914.2	620.0	479.9	340.5	242.7	207.6	119.7	105.0	31.8	
10 OPzS 1000	1997.2	1900.3	1761.2	1640.1	1356.2	1015.8	688.9	533.2	378.4	269.5	230.6	133.0	116.7	35.3	
11 OPzS 1100	2197.0	2090.3	1937.3	1804.1	1491.8	1117.4	757.8	586.4	416.2	296.5	253.7	146.3	128.3	38.8	
12 OPzS 1200	2396.7	2280.4	2113.4	1968.1	1627.5	1218.9	826.7	639.8	454.1	323.5	276.8	159.6	140.0	42.3	
12 OPzS 1500	2631.9	2540.7	2406.0	2285.0	1945.0	1513.6	1062.3	828.7	580.2	413.3	351.5	203.7	178.9	52.5	
13 OPzS 1625	2851.3	2752.4	2606.5	2475.4	2107.1	1639.7	1150.8	897.8	628.6	447.7	380.8	220.7	193.8	56.9	
14 OPzS 1750	3070.6	2964.2	2807.0	2665.7	2269.2	1765.8	1239.3	966.8	676.9	482.2	410.1	237.7	208.7	61.3	
15 OPzS 1875	3290.0	3175.8	3007.5	2856.2	2431.3	1892.0	1327.8	1035.8	725.3	516.6	439.4	254.6	223.6	65.6	
16 OPzS 2000	3509.3	3387.6	3208.0	3046.6	2593.4	2018.1	1416.3	1104.9	773.6	551.0	468.7	271.6	238.5	70.0	
20 OPzS 2500	4386.6	4234.4	4010.1	3808.2	3241.7	2522.6	1770.4	1381.2	967.1	688.8	585.9	339.5	298.1	87.5	
24 OPzS 3000	5264.0	5081.4	4812.0	4569.9	3890.0	3027.2	2124.5	1657.3	1160.5	826.6	703.1	407.4	357.7	105.0	
OPzS block 12/50	776.2	683.0	596.4	532.9	409.1	292.0	194.4	149.2	104.6	74.3	63.4	36.7	32.1	9.2	
OPzS block 12/100	1552.3	1366.1	1192.9	1065.9	818.2	584.0	388.7	298.5	209.3	148.7	126.9	73.5	64.1	18.4	
OPzS block 12/150	2328.6	2049.0	1789.3	1598.7	1227.1	876.0	583.2	447.7	313.8	223.0	190.4	110.2	96.2	27.6	
OPzS block 6/200	1552.3	1366.1	1192.9	1065.9	818.2	584.0	388.7	298.5	209.3	148.7	126.9	73.5	64.1	18.4	
OPzS block 6/250	1940.4	1707.5	1491.1	1332.3	1022.6	730.0	485.9	373.2	261.6	185.9	158.7	91.8	80.1	23.0	
OPzS block 6/300	2328.6	2049.0	1789.3	1598.7	1227.1	876.0	583.2	447.7	313.8	223.0	190.4	110.2	96.2	27.6	

DISCHARGE DATA (W) to 1.75 VPC at 25°C

Type	DISCHARGE TIME (Minutes)					DISCHARGE TIME (Hours)									
	1	5	10	15	30	1	2	3	5	8	10	20	24	100	
2 OPzS 100	220.2	205.6	188.1	174.6	139.8	101.3	68.5	52.6	37.1	26.4	22.6	13.1	11.4	3.2	
3 OPzS 150	330.2	308.3	282.0	262.0	209.7	151.9	102.6	79.0	55.5	39.6	33.8	19.6	17.1	4.8	
4 OPzS 200	440.3	411.1	376.0	349.2	279.5	202.7	136.8	105.2	74.1	52.7	45.2	26.2	22.8	6.4	
5 OPzS 250	550.4	513.9	470.0	436.6	349.4	253.3	171.0	131.6	92.6	65.9	56.4	32.7	28.5	8.0	
6 OPzS 300	660.5	616.7	564.1	524.0	419.3	304.0	205.3	157.9	111.1	79.1	67.7	39.3	34.2	9.6	
5 OPzS 350	727.7	684.3	631.5	585.3	473.2	347.6	235.3	182.7	129.2	93.0	79.4	47.0	41.3	12.4	
6 OPzS 420	873.2	821.1	757.7	702.3	567.9	417.1	282.3	219.2	155.0	111.6	95.3	56.4	49.5	14.8	
7 OPzS 490	1018.7	957.9	884.0	819.4	662.6	486.6	329.4	255.8	180.8	130.2	111.2	65.8	57.8	17.3	
6 OPzS 600	990.7	951.0	900.2	856.1	728.6	566.2	393.3	309.2	219.2	157.9	134.9	78.1	68.4	20.7	
7 OPzS 700	1155.8	1109.4	1050.2	998.8	850.0	660.6	458.9	360.8	255.8	184.2	157.4	91.1	79.9	24.1	
8 OPzS 800	1320.9	1268.0	1200.2	1141.5	971.4	754.8	524.4	412.3	292.3	210.5	179.9	104.1	91.3	27.5	
9 OPzS 900	1486.1	1426.4	1350.2	1284.0	1092.8	849.2	589.9	463.9	328.9	236.8	202.3	117.1	102.7	31.0	
10 OPzS 1000	1651.1	1585.0	1500.2	1426.7	1214.2	943.6	655.5	515.4	365.4	263.1	224.8	130.1	114.1	34.4	
11 OPzS 1100	1816.3	1743.4	1650.3	1569.4	1335.7	1037.9	721.0	567.0	401.9	289.5	247.3	143.1	125.5	37.9	
12 OPzS 1200	1981.4	1902.0	1800.3	1712.1	1457.1	1132.3	786.6	618.6	438.5	315.7	269.9	156.1	136.9	41.3	
12 OPzS 1500	2216.4	2148.2	2053.3	1973.4	1712.4	1367.3	979.9	780.8	562.8	407.4	345.7	199.4	174.5	51.1	
13 OPzS 1625	2401.1	2327.2	2224.3	2137.8	1855.1	1481.3	1061.6	845.8	609.7	441.3	374.4	216.0	189.1	55.4	
14 OPzS 1750	2585.8	2506.1	2395.5	2302.2	1997.8	1595.3	1143.1	910.9	656.6	475.2	403.2	232.6	203.6	59.6	
15 OPzS 1875	2770.5	2685.2	2566.5	2466.7	2140.5	1709.2	1224.8	976.0	703.5	509.3	432.1	249.3	218.2	63.9	
16 OPzS 2000	2955.3	2864.2	2737.7	2631.1	2283.2	1823.1	1306.5	1041.0	750.4	543.2	460.8	265.9	232.7	68.2	
20 OPzS 2500	3694.1	3580.3	3422.1	3288.9	2854.0	2278.9	1633.1	1301.3	938.1	678.9	576.0	332.3	290.9	85.2	
24 OPzS 3000	4432.9	4296.3	4106.4	3946.6	3424.9	2734.7	1959.7	1561.6	1125.6	814.7	691.2	398.8	349.1	102.2	
OPzS block 12/50	649.3	588.4	529.8	483.6	388.4	281.6	190.2	147.7	103.4	73.3	62.7	36.3	31.6	9.1	
OPzS block 12/100	1298.5	1176.8	1059.7	967.2	776.8	563.1	380.3	295.5	207.0	146.6	125.5	72.6	63.3	18.2	
OPzS block 12/150	1947.9	1765.3	1589.5	1450.8	1165.2	844.7	570.4	443.2	310.4	219.9	188.2	109.0	95.0	27.3	
OPzS block 6/200	1298.5	1176.8	1059.7	967.2	776.8	563.1	380.3	295.5	207.0	146.6	125.5	72.6	63.3	18.2	
OPzS block 6/250	1623.2	1471.1	1324.6	1209.0	970.9	703.9	475.3	369.4	258.6	183.2	156.8	90.8	79.1	22.8	
OPzS block 6/300	1947.9	1765.3	1589.5	1450.8	1165.2	844.7	570.4	443.2	310.4	219.9	188.2	109.0	95.0	27.3	

OPzS

Lead Selenium
Tubular Plate Battery

DISCHARGE DATA (W) to 1.80 VPC at 25°C

Type	DISCHARGE TIME (Minutes)					DISCHARGE TIME (Hours)									
	1	5	10	15	30	1	2	3	5	8	10	20	24	100	
2 OPzS 100	198.9	187.0	173.5	161.0	130.8	96.9	65.7	51.0	36.0	25.8	22.1	12.8	11.1	3.1	
3 OPzS 150	298.2	280.5	260.2	241.4	196.2	145.4	98.6	76.4	54.1	38.7	33.1	19.2	16.7	4.7	
4 OPzS 200	397.6	374.0	346.9	321.9	261.7	193.8	131.5	102.0	72.0	51.6	44.1	25.5	22.2	6.2	
5 OPzS 250	497.1	467.5	433.7	402.4	327.1	242.3	164.3	127.5	90.1	64.5	55.1	31.9	27.8	7.8	
6 OPzS 300	596.5	561.0	520.4	482.8	392.4	290.7	197.2	153.0	108.0	77.4	66.2	38.3	33.3	9.3	
5 OPzS 350	562.9	530.9	490.7	458.5	385.1	302.0	217.6	172.4	124.8	89.9	77.1	45.5	39.9	12.0	
6 OPzS 420	675.5	637.0	588.7	550.2	462.2	362.4	261.0	206.9	149.8	107.9	92.4	54.6	47.9	14.4	
7 OPzS 490	788.0	743.2	686.9	641.9	539.3	422.7	304.5	241.4	174.8	125.9	107.8	63.7	55.9	16.8	
6 OPzS 600	789.9	760.3	727.9	697.2	614.7	496.2	363.4	290.3	208.4	151.9	130.4	75.1	65.7	19.8	
7 OPzS 700	921.6	886.9	849.1	813.4	717.2	579.0	424.0	338.7	243.2	177.3	152.1	87.6	76.7	23.1	
8 OPzS 800	1053.3	1013.7	970.4	929.6	819.5	661.6	484.5	387.1	277.9	202.7	173.9	100.1	87.6	26.4	
9 OPzS 900	1184.9	1140.4	1091.8	1045.8	922.0	744.3	545.1	435.5	312.6	228.0	195.6	112.6	98.6	29.7	
10 OPzS 1000	1316.6	1267.1	1213.1	1162.0	1024.5	827.1	605.6	483.9	347.3	253.3	217.5	125.2	109.5	33.0	
11 OPzS 1100	1448.2	1393.8	1334.3	1278.2	1126.9	909.7	666.2	532.2	382.1	278.7	239.2	137.7	120.4	36.3	
12 OPzS 1200	1579.8	1520.5	1455.7	1394.4	1229.3	992.5	726.8	580.7	416.9	304.0	260.9	150.2	131.4	39.6	
12 OPzS 1500	1829.4	1776.3	1708.8	1650.5	1480.1	1216.6	904.3	735.0	532.4	385.8	331.4	190.9	166.9	48.8	
13 OPzS 1625	1981.9	1924.2	1851.3	1788.0	1603.4	1318.0	979.5	796.3	576.8	418.0	359.0	206.8	180.8	52.8	
14 OPzS 1750	2134.3	2072.3	1993.6	1925.6	1726.7	1419.4	1054.9	857.5	621.1	450.1	386.6	222.7	194.7	56.9	
15 OPzS 1875	2286.8	2220.3	2136.0	2063.1	1850.0	1520.7	1130.3	918.8	665.5	482.3	414.2	238.7	208.6	61.0	
16 OPzS 2000	2439.3	2368.4	2278.4	2200.7	1973.4	1622.1	1205.6	980.1	709.8	514.4	441.8	254.6	222.5	65.0	
20 OPzS 2500	3049.1	2960.4	2848.0	2750.9	2466.8	2027.7	1507.1	1225.0	887.3	643.0	552.3	318.2	278.2	81.3	
24 OPzS 3000	3658.8	3552.5	3417.6	3301.0	2960.1	2433.2	1808.4	1470.1	1064.7	771.6	662.8	381.8	333.8	97.6	
OPzS block 12/50	574.2	530.1	483.9	447.3	363.5	269.3	182.7	141.8	100.1	71.5	61.2	35.5	30.9	9.0	
OPzS block 12/100	1148.5	1060.3	968.0	894.5	727.0	538.7	365.4	283.4	200.2	143.1	122.4	71.0	61.7	18.0	
OPzS block 12/150	1722.7	1590.4	1451.9	1341.8	1090.5	808.0	548.1	425.1	300.3	214.6	183.8	106.5	92.6	27.0	
OPzS block 6/200	1148.5	1060.3	968.0	894.5	727.0	538.7	365.4	283.4	200.2	143.1	122.4	71.0	61.7	18.0	
OPzS block 6/250	1435.7	1325.3	1209.9	1118.1	908.8	673.4	456.8	354.3	250.3	178.8	153.1	88.7	77.2	22.5	
OPzS block 6/300	1722.7	1590.4	1451.9	1341.8	1090.5	808.0	548.1	425.1	300.3	214.6	183.8	106.5	92.6	27.0	

DISCHARGE DATA (W) to 1.85 VPC at 25°C

Type	DISCHARGE TIME (Minutes)					DISCHARGE TIME (Hours)									
	1	5	10	15	30	1	2	3	5	8	10	20	24	100	
2 OPzS 100	156.0	149.5	141.0	133.5	112.7	87.0	60.4	47.6	34.1	24.5	21.0	12.1	10.5	2.9	
3 OPzS 150	234.0	224.3	211.6	200.2	169.1	130.5	90.5	71.4	51.1	36.8	31.4	18.2	15.8	4.4	
4 OPzS 200	312.1	299.0	282.0	267.0	225.3	174.1	120.6	95.1	68.1	48.9	41.9	24.3	21.0	5.9	
5 OPzS 250	390.1	373.8	352.6	333.7	281.7	217.6	150.8	119.0	85.3	61.2	52.4	30.4	26.3	7.4	
6 OPzS 300	468.1	448.7	423.2	400.5	338.0	261.1	181.0	142.8	102.3	73.4	62.9	36.4	31.6	8.8	
5 OPzS 350	465.2	440.4	409.5	384.5	327.0	258.5	189.1	153.1	115.2	85.3	73.3	43.8	38.3	11.5	
6 OPzS 420	558.2	528.5	491.5	461.4	392.4	310.2	226.9	183.8	138.2	102.4	88.0	52.6	45.9	13.8	
7 OPzS 490	651.2	616.6	573.4	538.3	457.8	361.9	264.7	214.4	161.2	119.4	102.7	61.4	53.6	16.1	
6 OPzS 600	617.4	602.5	582.2	562.8	505.4	423.6	320.3	262.1	191.9	142.4	121.9	71.2	62.1	18.7	
7 OPzS 700	720.3	702.9	679.2	656.6	589.6	494.1	373.7	305.7	224.0	166.1	142.3	83.1	72.5	21.8	
8 OPzS 800	823.2	803.3	776.3	750.3	673.8	564.8	427.0	349.3	255.9	189.8	162.5	95.0	82.8	24.9	
9 OPzS 900	926.1	903.7	873.3	844.2	758.0	635.4	480.4	393.0	287.9	213.6	182.9	106.8	93.2	28.0	
10 OPzS 1000	1029.0	1004.1	970.3	938.0	842.2	705.9	533.8	436.7	319.9	237.3	203.2	118.7	103.5	31.1	
11 OPzS 1100	1131.9	1104.5	1067.4	1031.7	926.4	776.6	587.2	480.4	351.9	261.0	223.5	130.6	113.9	34.2	
12 OPzS 1200	1234.8	1205.0	1164.5	1125.6	1010.6	847.1	640.6	524.1	383.9	284.8	243.8	142.4	124.3	37.3	
12 OPzS 1500	1446.4	1409.3	1364.8	1327.0	1205.6	1026.2	786.1	639.7	474.1	345.9	295.8	174.5	152.0	44.6	
13 OPzS 1625	1566.9	1526.7	1478.5	1437.6	1306.1	1111.7	851.7	693.0	513.6	374.7	320.5	189.1	164.7	48.3	
14 OPzS 1750	1687.5	1644.2	1592.2	1548.1	1406.6	1197.2	917.2	746.3	553.0	403.5	345.0	203.6	177.3	52.0	
15 OPzS 1875	1808.0	1761.6	1705.9	1658.7	1507.1	1282.7	982.7	799.6	592.5	432.4	369.7	218.2	190.0	55.7	
16 OPzS 2000	1928.5	1879.1	1819.7	1769.4	1607.4	1368.3	1048.2	852.9	632.0	461.3	394.4	232.7	202.7	59.5	
20 OPzS 2500	2410.7	2348.9	2274.6	2211.6	2009.4	1710.3	1310.2	1066.2	790.0	576.6	493.0	290.9	253.3	74.3	
24 OPzS 3000	2892.9	2818.5	2729.6	2654.0	2411.2	2052.3	1572.3	1279.4	948.0	691.8	591.6	349.1	304.0	89.2	
OPzS block 12/50	447.0	424.1	394.6	371.4	313.1	241.9	167.7	132.3	94.7	67.3	57.4	33.8	29.1	8.4	
OPzS block 12/100	894.1	848.3	789.2	742.9	626.2	483.7	335.4	264.5	189.5	134.7	114.9	67.5	58.2	16.8	
OPzS block 12/150	1341.1	1272.4	1183.8	1114.3	939.3	725.7	503.0	396.8	284.2	202.0	172.3	101.3	87.4	25.3	
OPzS block 6/200	894.1	848.3	789.2	742.9	626.2	483.7	335.4	264.5	189.5	134.7	114.9	67.5	58.2	16.8	
OPzS block 6/250	1117.6	1060.3	986.5	928.6	782.8	604.7	419.2	330.6	236.9	168.4	143.6	84.4	72.8	21.1	
OPzS block 6/300	1341.1	1272.4	1183.8	1114.3	939.3	725.7	503.0	396.8	284.2	202.0	172.3	101.3	87.4	25.3	