



*Renewable
Energy
Solutions*



Renewable Energy Solutions

RENEWABLE ENERGY SOLUTIONS FOR A GLOBAL MARKETPLACE

EXPERIENCE – With over 100 years experience in battery manufacture, it's little wonder EnerSys is the global leader in energy storage. Our reputation for superior quality products and innovative technology is the reason EnerSys is the undisputed first choice worldwide.

GLOBAL REACH – Headquartered in Pennsylvania, USA, with regional headquarters in Europe and Asia, EnerSys employs over 7,000 people and operates over twenty manufacturing and assembly facilities worldwide, with a presence in twenty nine countries. This vast infrastructure positions EnerSys at the forefront of both manufacturing capabilities and new product development.

RENEWABLE ENERGY PRODUCTS FOR A CHANGING WORLD

EnerSys batteries for Renewable Energy benefit from state-of-the-art manufacturing and quality procedures, together with a rigorous research and development program resulting in improved technology to satisfy both environmental, economic and technical demands. Whether you are generating electricity from solar, wind or water, EnerSys offers the widest choice of technologies for the most effective solution.

RENEWABLE ENERGY BRANDS FOR WORLDWIDE SOLUTIONS

PowerSafe – Premium range of high reliability flooded and valve-regulated lead acid products to serve the demanding requirements of the renewable energy markets. PowerSafe products offer the broadest range of flooded and valve-regulated lead acid products to provide total support for renewable energy applications including peak-load handling, remote telephony, repeater stations, rural power, traffic signals and village electrification.

Cyclon – Thin plate rechargeable cells using a patented starved-electrolyte system providing high reliability, fast recharge and excellent cyclic performance. Cyclon cells offer a high degree of flexibility to meet unusual requirements and can be custom configured in an infinite number of designs to meet your precise voltage and ampere-hour requirements.

The use of the gas recombination technology for lead acid batteries has totally changed the concept of standby power. This technology provides the user with new freedom for use in renewable energy applications. The minimal level of gas release allows batteries to be installed in low ventilation situations and the lack of water addition removes the need for extensive maintenance.

The PowerSafe OPzV range of single cells use both gel electrolyte (VRLA) and tubular plate technologies to offer the full benefits of gas recombination as well as the excellent cyclic performance required for renewable energy applications.



Features and Benefits

Performance

- Capacity range: 270Ah to 3930Ah
- 1400 cycles to 80% depth of discharge

Reliability and robustness

- Die-cast positive tubular plates for longer life
- Lead calcium tin alloy permits medium depth of discharge
- Lid and case in ABS (flame retardant on request)

Installation and maintenance

- Vertical as well as horizontal installations are available for some cells sizes
- No watering or topping up required

Safety

- No risk of electrolyte leakage (immobilised in gel)

- Very low gas release in normal operation (recombination efficiency >95%)
- Each cell is equipped with a one way pressure relief valve with integral flame arrestor
- Insulated connectors and terminals for personnel safety
- Protection of polarities during transport

Standards

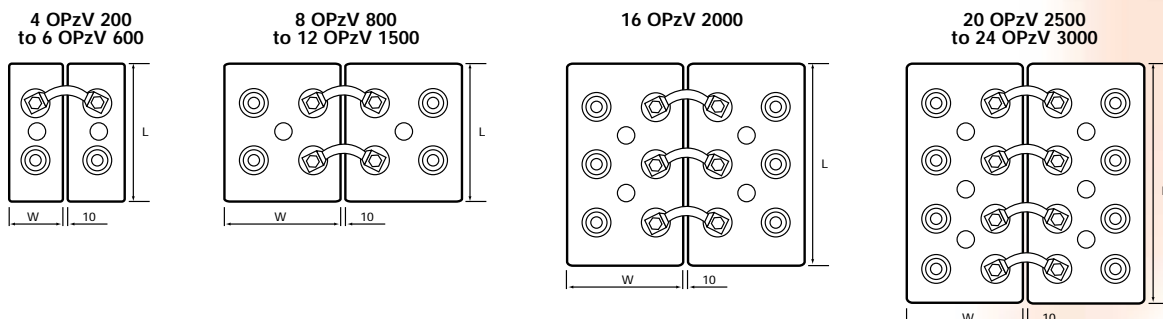
- Conforms to both the DIN standard 40742 (valve regulated OPzV single cells) and the international standard IEC 60896-2
- Low ventilation requirement according to EN 50272-2
- EnerSys manufacturing facilities worldwide are certified to ISO 9001

General Specifications

Type	Nominal Voltage (V)	Terminal Pairs	Nominal Capacity (Ah)			Nominal Dimensions						Typical Weight	
			10 hr rate to 1.80Vpc @ 25°C	120 hr rate to 1.85Vpc @ 25°C	240 hr rate to 1.90Vpc @ 25°C	Length		Width		Height		kg	lbs
						mm	in	mm	in	mm	in		
4 OPzV 200	2	1	215	273	254	103	4.1	206	8.1	403	15.8	19.5	43.0
5 OPzV 250	2	1	270	343	319	124	4.9	206	8.1	403	15.8	23.5	51.9
6 OPzV 300	2	1	325	413	385	145	5.7	206	8.1	403	15.8	28.0	61.8
5 OPzV 350	2	1	385	484	451	124	4.9	206	8.1	520	20.3	31.0	68.4
6 OPzV 420	2	1	460	574	535	145	5.7	206	8.1	520	20.3	36.5	80.5
7 OPzV 490	2	1	540	678	632	166	6.5	206	8.1	520	20.3	42.0	92.6
6 OPzV 600	2	1	700	895	834	145	5.7	206	8.1	695	27.3	50.0	110.3
8 OPzV 800	2	2	935	1187	1107	210	8.2	191	7.5	695	27.3	68.0	150.0
10 OPzV 1000	2	2	1170	1491	1391	210	8.2	233	9.2	695	27.3	82.0	180.8
12 OPzV 1200	2	2	1405	1796	1675	210	8.2	275	10.8	695	27.3	97.0	213.9
12 OPzV 1500	2	2	1585	1967	1834	210	8.2	275	10.8	845	33.3	120.0	264.6
16 OPzV 2000	2	3	2115	2629	2452	212	8.3	397	15.6	820	32.3	165.0	363.8
20 OPzV 2500	2	4	2640	3272	3053	212	8.3	487	19.2	820	32.3	200.0	441.0
24 OPzV 3000	2	4	3170	3932	3669	212	8.3	576	22.3	820	32.3	240.0	529.2

The electrical values shown in the table relate to loadings from a fully charged condition.

Terminal Layouts



The PowerSafe XP range is ideal for the more demanding applications where frequent discharges down to 75% DOD are required.

Features and Benefits

- Capacity range: 60Ah to 215Ah
- 1000 cycles to 80% depth of discharge
- Lead antimony positive plates with AGM technology (no watering)
- Terminals with brass inserts for maximum conductivity
- Lid and case in strong ABS with reinforced ribbed corners
- One-way pressure relief valve with integral flame arrestor
- Insulated connectors and terminals for personnel safety



General Specifications

Type	Nominal Voltage (V)	Nominal Capacity (Ah)			Nominal Dimensions				Typical Weight			
		10 hr rate to 1.80Vpc @ 25°C	120 hr rate to 1.85Vpc @ 25°C	240 hr rate to 1.90Vpc @ 25°C	Length		Width		Height		kg	lbs
12XP51	12	51	59	57	271	10.7	164	6.5	220	8.7	22.1	48.7
12XP73 ⁽¹⁾	12	72	84	80	360	14.2	164	6.5	227	8.9	30.6	67.5
12XP160 ⁽¹⁾	12	137	178	170	561	22.1	125	4.9	316	12.4	67.0	147.7
6XP180 ⁽¹⁾	6	185	214	204	244	9.6	190	7.2	276	10.9	37.0	81.6

(1) with integral lifting handles.

The PowerSafe VE offers a large range of VRLA monoblocs suitable for applications with long periods of inactivity and low depths of discharge (DOD) typically up to 10%.



Features and Benefits

- Capacity range: 50Ah to 580Ah
- 2000 cycles to 10% depth of discharge
- Lead calcium tin plates with AGM technology (no watering)
- Terminals with brass inserts for maximum conductivity
- Lid and case in strong ABS
- One-way pressure relief valve with integral flame arrestor
- Insulated connectors and terminals for personnel safety
- Six months shelf life at 20°C

General Specifications

Type	Nominal Voltage (V)	Nominal Capacity (Ah)			Nominal Dimensions				Typical Weight			
		10 hr rate to 1.80Vpc @ 25°C	120 hr rate to 1.85Vpc @ 25°C	240 hr rate to 1.90Vpc @ 25°C	Length		Width		Height		kg	lbs
12VE50	12	46	53	51	218	8.9	164	6.6	220	8.7	18.9	41.7
12VE60 ⁽¹⁾	12	56	65	62	271	10.7	164	6.6	220	8.7	22.9	50.5
12VE75 ⁽¹⁾	12	68	79	75	314	12.4	164	6.6	220	8.7	26.7	58.9
12VE90 ⁽¹⁾	12	79	91	87	360	14.2	164	6.6	227	8.9	31.3	69.0
12VE115F	12	105	120	115	561	22.1	125	4.9	235	9.3	46.0	101.4
6VE110 ⁽¹⁾	6	102	118	113	191	7.5	206	8.1	236	9.3	21.4	47.2
6VE140 ⁽¹⁾	6	132	152	146	243	9.6	206	8.1	234	9.2	27.9	61.5
2VE170	2	152	175	168	128	5.0	165	6.5	220	8.7	10.2	22.5
6VE180 ⁽¹⁾	6	173	191	182	296	11.6	204	8.0	234	9.2	34.1	75.2
2VE225	2	200	231	221	110	4.3	208	8.2	260	10.2	13.9	30.6
2VE310	2	275	318	304	142	5.6	208	8.2	260	10.2	18.5	40.8
2VE400	2	350	404	287	195	7.7	208	8.2	260	10.2	24.0	52.9
2VE450	2	400	462	442	195	7.7	208	8.2	260	10.2	26.2	57.8
2VE550 ⁽¹⁾	2	518	578	552	238	9.4	208	8.2	260	10.2	32.1	70.8

(1) with integral lifting handles.

PowerSafe TS tubular positive plate cells have been specially designed for renewable energy applications to ensure total safety and an uninterruptible supply of energy during periods of reduced sunshine and during the night. Their excellent cycling performance and low water consumption permit a long life expectancy with reduced maintenance.

Features and Benefits

Performance

- Capacity range: 245Ah to 4580Ah
- 1700 cycles to 80% depth of discharge

Reliability and robustness

- Die-cast positive tubular plates for longer life
- Lead antimony alloy limiting self-discharge and optimising cycle life

Installation and maintenance

- Large electrolyte reserve for yearly watering
- All cells are available dry charged

Safety

- Each cell is equipped with an acid-proof flame arrestor plug
- Insulated connectors and terminals for personnel safety
- Protection of polarities during transport



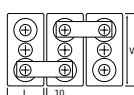
General Specifications

Type	Nominal Voltage (V)	Terminal Pairs	Nominal Capacity (Ah)			Nominal Dimensions						Typical Weight	
			10 hr rate to 1.80Vpc @ 25°C	120 hr rate to 1.85Vpc @ 25°C	240 hr rate to 1.90Vpc @ 25°C	Length		Width		Height		kg	lbs
TLS 3	2	1	180	245	234	103	4.1	206	8.1	389	15.3	16.4	36.2
TLS 4	2	1	220	300	287	103	4.1	206	8.1	389	15.3	18.4	40.6
TLS 5	2	1	270	367	351	124	4.9	206	8.1	389	15.3	22.2	49.0
TLS 6	2	1	323	440	422	145	5.7	206	8.1	389	15.3	26.0	57.3
TVS 4	2	1	340	460	438	124	4.9	206	8.1	505	19.9	27.0	59.5
TVS 5	2	1	390	530	507	124	4.9	206	8.1	505	19.9	29.7	65.5
TVS 6	2	1	470	640	612	145	5.7	206	8.1	505	19.9	34.7	76.5
TVS 7	2	1	550	745	714	166	6.5	206	8.1	505	19.9	39.8	87.8
TYS 5	2	1	590	802	768	145	5.7	206	8.1	684	26.9	43.9	96.8
TYS 6	2	1	670	915	866	145	5.7	206	8.1	684	26.9	47.7	105.2
TYS 7	2	1	816	1120	1070	191	7.5	210	8.3	684	26.9	59.0	130.1
TYS 8	2	1	900	1220	1155	191	7.5	210	8.3	684	26.9	62.7	138.3
TYS 9	2	1	1040	1415	1352	233	9.1	210	8.3	684	26.9	73.1	161.2
TYS 10	2	1	1120	1523	1444	233	9.1	210	8.3	684	26.9	76.8	169.4
TYS 11	2	1	1260	1714	1633	275	10.8	210	8.3	684	26.9	87.3	192.5
TYS 12	2	1	1340	1825	1730	275	10.8	210	8.3	684	26.9	91.0	200.7
TZS 11	2	2	1560	2130	2030	275	10.8	210	8.3	829	32.6	112.9	248.9
TZS 12	2	2	1710	2335	2198	275	10.8	210	8.3	829	32.6	117.6	259.3
TZS 13	2	3	1940	2640	2507	399	15.7	214	8.4	813	32.0	147.1	324.4
TZS 14	2	3	2040	2775	2644	399	15.7	214	8.4	813	32.0	151.7	334.5
TZS 15	2	3	2150	2925	2793	399	15.7	214	8.4	813	32.0	156.4	344.9
TZS 16	2	3	2240	3050	2923	399	15.7	214	8.4	813	32.0	161.0	355.0
TZS 17	2	4	2430	3310	3178	487	19.2	212	8.4	813	32.0	186.3	410.8
TZS 18	2	4	2555	3480	3324	487	19.2	212	8.4	813	32.0	191.0	421.2
TZS 20	2	4	2800	3810	3643	487	19.2	212	8.4	813	32.0	200.1	441.2
TZS 22	2	4	3090	4210	4010	576	22.3	212	8.4	813	32.0	227.8	502.3
TZS 24	2	4	3360	4580	4397	576	22.3	212	8.4	813	32.0	237.3	523.2

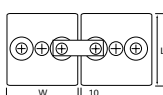
The electrical values shown in the table relate to loadings from a fully charged condition.

Terminal Layouts

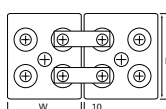
TLS 3 - TYS 6



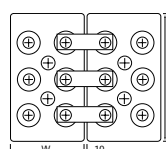
TYS 7 - TYS 12



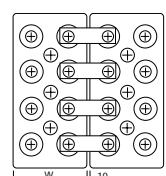
TZS 11 & TZS 12



TZS 13 - TZS16



TZS 17 - TZS24



The PowerSafe OPzS range of single cells uses proven tubular plate technology to offer a very high level of reliability as well as the excellent cyclic performance required for renewable energy applications. The use of a lead with low antimony alloy minimises the self-discharge rate for increased flexibility.



Features and Benefits

Performance

- Capacity range: 300Ah to 4620Ah
- 1500 cycles to 80% depth of discharge

Reliability and robustness

- Die-cast positive tubular plates for longer life
- Lead with low antimony alloy offers a low self-discharge rate

Installation and maintenance

- Large electrolyte reserve for yearly watering
- All cells are available dry charged

Safety

- Each cell is equipped with an acid-proof flame arrestor plug
- Insulated connectors and terminals for personnel safety
- Protection of polarities during transport

Standards

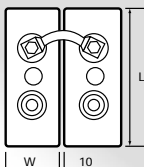
- Conforms to both the DIN standard 40736 (OPzS single cells) and the international standard IEC 60896-1
- EnerSys manufacturing facilities worldwide are certified to ISO 9001

General Specifications

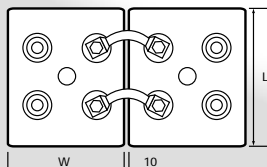
Type	Nominal Voltage (V)	Terminal Pairs	Nominal Capacity (Ah)			Nominal Dimensions						Typical Weight	
			10 hr rate to 1.80Vpc @ 25°C	120 hr rate to 1.85Vpc @ 25°C	240 hr rate to 1.90Vpc @ 25°C	Length		Width		Height		kg	lbs
4 OPzS 200	2	1	222	302	289	103	4.1	206	8.1	394	15.5	17.2	37.8
5 OPzS 250	2	1	278	370	354	124	4.9	206	8.1	394	15.5	20.8	45.8
6 OPzS 300	2	1	333	444	425	145	5.7	206	8.1	394	15.5	24.3	53.4
5 OPzS 350	2	1	401	532	512	124	4.9	206	8.1	510	20.1	26.9	59.1
6 OPzS 420	2	1	482	643	617	145	5.7	206	8.1	510	20.1	31.5	69.3
7 OPzS 490	2	1	562	749	720	166	6.5	206	8.1	510	20.1	36.1	79.4
6 OPzS 600	2	1	679	923	873	145	5.7	206	8.1	685	27.0	44.8	98.6
7 OPzS 700	2	2	841	1129	1080	210	8.2	191	7.5	685	27.0	57.6	126.7
8 OPzS 800	2	2	906	1230	1165	210	8.2	191	7.5	685	27.0	61.3	134.9
9 OPzS 900	2	2	1071	1429	1365	210	8.2	233	9.2	685	27.0	70.9	156.0
10 OPzS 1000	2	2	1133	1538	1457	210	8.2	233	9.2	685	27.0	74.6	164.1
11 OPzS 1100	2	2	1297	1728	1648	210	8.2	275	10.8	685	27.0	84.4	185.7
12 OPzS 1200	2	2	1359	1845	1745	210	8.2	275	10.8	685	27.0	88.0	193.6
11 OPzS 1375	2	2	1637	2143	2048	210	8.2	275	10.8	835	32.9	109.0	239.8
12 OPzS 1500	2	2	1730	2359	2218	210	8.2	275	10.8	835	32.9	114.0	250.8
13 OPzS 1625	2	3	1967	2667	2530	214	8.4	399	15.7	811	31.9	140.0	308.0
14 OPzS 1750	2	3	2101	2799	2669	214	8.4	399	15.7	811	31.9	144.0	316.8
15 OPzS 1875	2	3	2214	2954	2818	214	8.4	399	15.7	811	31.9	149.0	327.8
16 OPzS 2000	2	3	2307	3077	2950	214	8.4	399	15.7	811	31.9	151.0	332.2
17 OPzS 2125	2	4	2544	3341	3208	212	8.3	487	19.2	811	31.9	180.0	396.0
18 OPzS 2250	2	4	2678	3515	3355	212	8.3	487	19.2	811	31.9	184.0	404.8
20 OPzS 2500	2	4	2884	3849	3676	212	8.3	487	19.2	811	31.9	193.0	424.6
22 OPzS 2750	2	4	3244	4250	4047	212	8.3	576	22.3	811	31.9	225.0	495.0
24 OPzS 3000	2	4	3460	4621	4438	212	8.3	576	22.3	811	31.9	234.0	514.8

Terminal Layouts

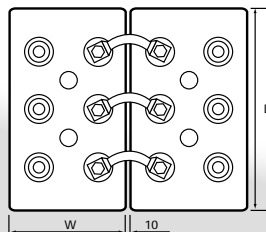
4 OPzS 200 to 6 OPzS 600



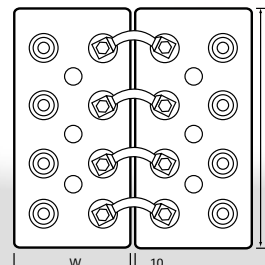
7 OPzS 700 to 12 OPzS 1500



13 OPzS 1625 to 16 OPzS 2000



17 OPzS 2125 to 24 OPzS 3000



PowerSafe GLS monoblocs are perfectly suited to renewable energy applications using vented tubular technology and lead-antimony alloys to offer a substantial cycle life and high levels of safety and reliability.

Features and Benefits

- Capacity range: 75Ah to 425Ah
- 1500 cycles to 80% depth of discharge
- Die-cast positive tubular plates for longer life
- Lead with low antimony alloy offering a low self-discharge rate
- Large electrolyte reserve for yearly watering
- Each cell is equipped with an acid-proof flame arrestor plug
- Insulated connectors and terminals for personnel safety
- Protection of polarities during transport
- All cells are available dry charged



General Specifications

Type	Nominal Voltage (V)	Nominal Capacity (Ah)			Nominal Dimensions						Typical Weight	
		10 hr rate to 1.80Vpc @ 25°C	120 hr rate to 1.85Vpc @ 25°C	240 hr rate to 1.90Vpc @ 25°C	Length		Width		Height		kg	lbs
GLS 12/60	12	62	76	73	272	10.7	205	8.1	380	15.0	34.8	76.7
GLS 12/100	12	108	141	136	272	10.7	205	8.1	380	15.0	44.4	97.9
GLS 12/150	12	162	212	205	380	15.0	205	8.1	380	15.0	63.6	140.2
GLS 6/210	6	216	283	273	272	10.7	205	8.1	380	15.0	43.3	95.5
GLS 6/270	6	270	374	361	380	15.0	205	8.1	380	15.0	57.0	125.7
GLS 6/310	6	324	424	409	380	15.0	205	8.1	380	15.0	62.2	137.2

The CYCLON range consists of thin plate rechargeable cells using a patented starved-electrolyte system providing high reliability, fast recharge and excellent cyclic performance. CYCLON cells offer a high degree of flexibility ideal for renewable energy applications and can be custom configured in an infinite number of designs to meet your precise voltage and amp-hour requirements.

Features and Benefits

- Capacity range: 2.5Ah to 25Ah
- 300 cycles to 100% depth of discharge
- Pure lead-tin chemistry and VRLA technology
- Class leading power density
- UL94 V-0 casing is available
- High-vent pressure design prevents dry-out after repeated cycling
- Fast recharge (up to 4 times quicker)
- Widest temperature range and rugged construction offering exceptional performance under extreme conditions
- Up to 2 years shelf life due to very low self-discharge

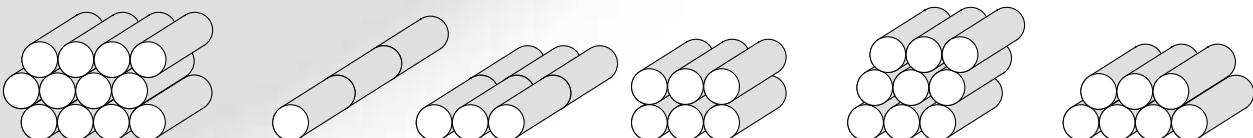


General Specifications

Type	Part Number	Nominal Voltage (V)	Nominal Capacity (Ah)	Nominal Dimensions						Typical Weight	
			10 hr rate to 1.67Vpc @ 25°C	Diameter		Height		Height with terminal		kg	lbs
D Single Cell (Dsc)	0810-0004	2	2.5	34.3	1.35	61.2	2.41	68.1	2.68	0.18	0.39
DT Single Cell (DTsc)	0860-0004	2	4.5	34.3	1.35	96.0	3.78	102.9	4.05	0.28	0.61
X Single Cell (Xsc)	0800-0004	2	5.0	44.5	1.75	72.9	2.87	81.5	3.21	0.36	0.80
E Single Cell (Esc)	0850-0004	2	8.0	44.5	1.75	100.1	3.94	108.7	4.28	0.49	1.08
J Single Cell (Jsc)	0840-0004	2	12.0	51.8	2.04	123.2	4.85	135.6	5.34	0.84	1.85
BC Single Cell (BCsc)	0820-0004	2	25.0	65.3	2.57	158.8	6.25	173.2	6.82	1.67	3.68

Alternative Battery Configurations

Standard battery configurations are rectangular in overall shape. A sample of other possible configurations are illustrated below. These can be held together with tape (offering the lowest cost and minimum electrical and mechanical protection) or by shrink wrapping. The CYCLON Single Cell can be custom configured in virtually an infinite number of designs.





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Wherever in the world you do business, EnerSys is with you all the way. With large manufacturing plants strategically located throughout Asia, Europe and North and South America, combined with a strong global sales and support team, and backed with a reputation for world-leading technology, our customers benefit through supply reliability, high quality products designed to meet ever increasing technical requirements, and our commitment to providing the best solution to meet their Reserve Power needs.

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