

PowerSafe®

Sustainable Solutions

PowerSafe® TS Range Summary



The PowerSafe® TS range of single cells offers high performance, long life solutions for renewable energy applications.

PowerSafe® TS cells are based on proven vented technology and designed for renewable energy applications that require maximum cycle life with the highest level of reliability. They are particularly suitable for use in solar energy installations, ensuring a continuity of electrical supply during the hours of darkness or during periods of reduced sunshine.

Reduced maintenance is achieved through the use of additional electrolyte which means cells only have to be topped-up once a year. This helps to keep down maintenance costs and makes them an ideal solution for many remote or unmanned locations.

Tubular positive plates are widely used in batteries for particularly demanding applications. In the PowerSafe TS range they have been optimised to give an extended cycle life and increased capacity.

Key Benefits

- Capacities from 300Ah to 4580Ah at the 120 hour rate (C_{120})
- Products available filled & charged or moist charged
- Up to 5200 cycles to 25% depth of discharge
- Topping-up required once a year only
- Minimal maintenance required
- Excellent operational safety including: fully insulated connectors and terminals, acid proof flame arrestor plug for each cell, protection of polarities during transport

EnerSys
Power/Full Solutions

General Specifications

Battery Type	Nominal Voltage (V)	Number of Terminals	Nominal Capacity (Ah)		Nominal Dimensions (mm)			Moist Charged Cells		Filled & Charged Cells		Short Circuit Current (A)	Internal Resistance (mΩ)
			10hr rate to 1.80Vpc @ 20°C	120hr rate to 1.85Vpc @ 25°C	Length	Width	Height	Typical Weight (kg)	Electrolyte Volume* (Litres)	Typical Weight (kg)	Electrolyte Volume (Litres)		
TLS 4	2	2	220	300	103	206	389	14.6	2.5	18.0	3.9	2059	1.02
TLS 5	2	2	270	367	124	206	389	17.4	3.3	21.9	4.9	2625	0.80
TLS 6	2	2	323	440	145	206	389	20.3	3.9	25.6	5.8	3000	0.70
TVS 4	2	2	340	460	124	206	505	20.6	5.0	27.3	6.9	2838	0.74
TVS 5	2	2	390	530	124	206	505	24.1	4.4	30.0	6.6	3281	0.64
TVS 6	2	2	470	640	145	206	505	26.7	6.5	35.4	7.9	3750	0.56
TVS 7	2	2	550	745	166	206	505	32.1	6.2	40.7	9.2	4200	0.50
TYS 5	2	2	590	802	145	206	684	33.4	8.2	44.6	11.3	3621	0.58
TYS 6	2	2	670	912	145	206	684	38.1	7.5	48.4	11.0	4200	0.50
TYS 7	2	2	816	1120	191	210	684	45.4	10.6	59.6	14.8	5147	0.41
TYS 8	2	2	900	1220	191	210	684	50.0	9.8	63.2	14.5	5676	0.37
TYS 9	2	2	1040	1415	233	210	684	54.1	14.9	73.9	18.3	6625	0.32
TYS 10	2	2	1120	1523	233	210	684	60.9	12.3	77.8	18.0	7000	0.30
TYS 11	2	2	1260	1714	275	210	684	67.2	15.6	88.4	21.9	8108	0.26
TYS 12	2	2	1340	1825	275	210	684	71.8	14.9	92.3	21.6	8824	0.24
TZS 11	2	4	1560	2130	275	210	829	85.7	19.5	112.3	27.5	7554	0.28
TZS 12	2	4	1710	2335	275	210	829	90.1	19.8	117.0	27.1	8400	0.25
TZS 13	2	6	1940	2640	399	214	813	105.5	30.5	146.6	39.7	8936	0.24
TZS 14	2	6	2040	2775	399	214	813	114.0	29.0	153.4	39.6	9589	0.22
TZS 15	2	6	2150	2925	399	214	813	118.0	27.9	156.0	38.9	10294	0.20
TZS 16	2	6	2240	3050	399	214	813	123.5	27.4	160.9	38.9	11053	0.19
TZS 17	2	8	2430	3310	487	212	813	136.6	35.8	182.2	48.5	11667	0.18
TZS 18	2	8	2555	3480	487	212	813	142.9	34.5	186.7	47.8	12353	0.17
TZS 20	2	8	2800	3810	487	212	813	154.3	33.2	199.8	47.6	14000	0.15
TZS 22	2	8	3090	4210	576	212	813	170.1	41.8	223.5	57.7	11053	0.14
TZS 24	2	8	3360	4580	576	212	813	182.1	39.3	235.8	56.3	16154	0.13

Notes: The electrical values shown in the table relate to performance from a fully charged condition at ambient temperature of +25°C.

Height shown is overall height, including connectors and shrouds.

*Typical electrolyte volume for filling cells (1.280 SG electrolyte @ 20°C).

Construction

Positive electrode Die cast tubular plate with optimum lead antimony

Negative electrode Pasted flat plate with lead antimony alloy grid

Separators Low resistance microporous material

Container Moulded from durable, transparent styrene acrylonitrile (SAN) to allow electrolyte level and cell condition to be monitored visually

Lid Made from Acrylonitrile Butadiene Styrene (ABS)

Vent plugs Safety plugs equipped with flame arrestors. Special vent plugs allowing topping-up and S.G. reading without the need to remove them, are available on request

Electrolyte Diluted sulphuric acid with a specific gravity of 1.240 ±0.010 (maximum level) at 25°C for a fully charged cell. Large reserve of electrolyte reduces topping-up to once a year

Terminals Lead alloy leakproof pole with brass insert designed to give minimum resistance and maximum current flow

Connectors Fully insulated, solid copper inter-cell connectors allow voltage measurements

Installation and Operation

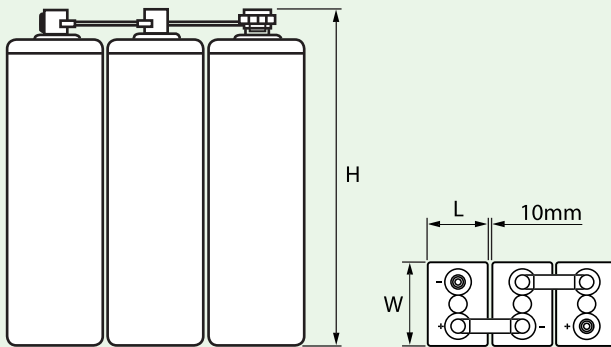
- The permissible operating temperature range is -10°C to $+45^{\circ}\text{C}$.
The recommended operating temperature range is $+10^{\circ}\text{C}$ to $+30^{\circ}\text{C}$ (the preferred value is 25°C)
- Can be installed on steel or wooden racks.
Large selection of stands available from EnerSys®

Standards

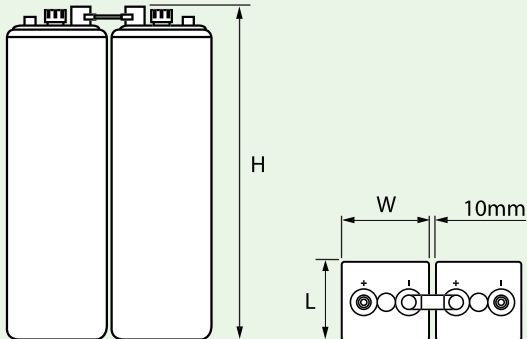
- Compliant with international standard IEC 61427-1:2013
- Manufactured in EnerSys ISO 9001 and ISO 14001 certified production facilities

Outline Drawings

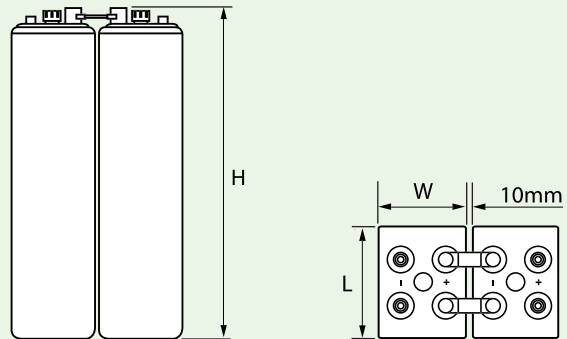
TLS, TVS, TYS 5 - TYS 6



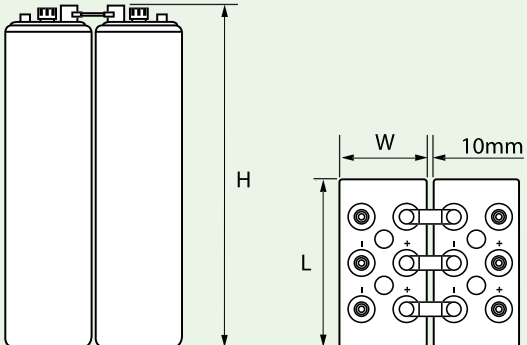
TYS 7 - TYS 12



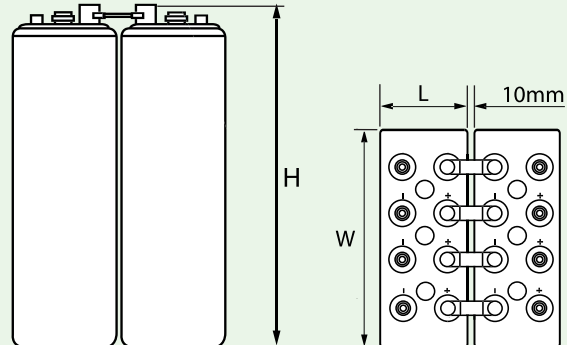
TZS 11, TZS 12



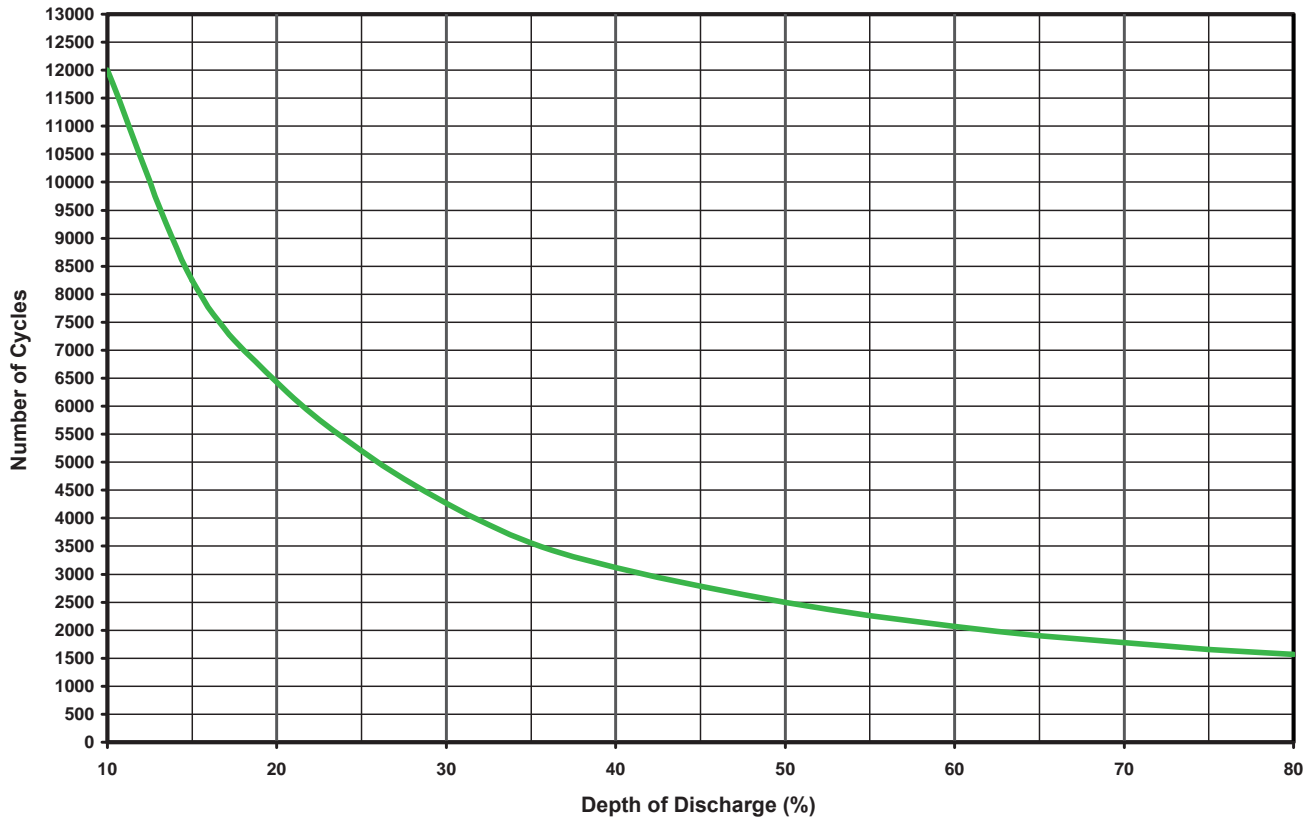
TZS 13 - TZS 16



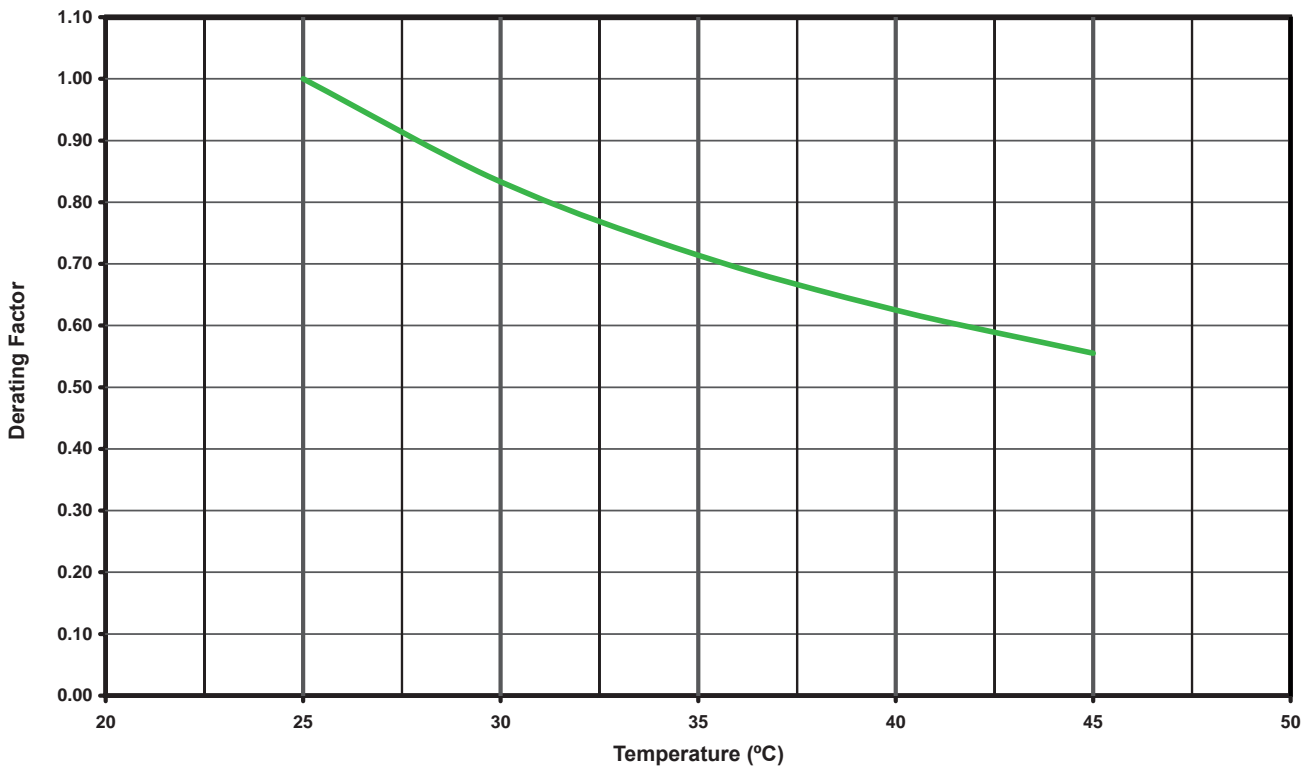
TZS 17 - TZS 24



Number of Cycles vs Depth of Discharge (25°C)



Derating Factor for Number of Cycles vs Average Cell Temperature



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