



# Installation manual

Rechargeable lead-acid battery 24Ah/12V

ZS-24



The rechargeable batteries are lead-lead dioxide systems. The dilute sulfuric acid electrolyte is absorbed by separators and plates and thus immobilized. Should the battery be accidentally overcharged producing hydrogen and oxygen, special one-way valves allow the gases to escape thus avoiding excessive pressure build-up. Otherwise, the battery is completely sealed and is, therefore, maintenance-free, leak proof and usable in any position.

### Battery Construction

Component	Positive plate	Negative plate	Container	Cover	Safety valve	Terminal	Separator	Electrolyte
Raw material	Lead dioxide	Lead	ABS	ABS	Rubber	Copper/Pug	Fiberglass	Sulfuric acid

### General Features

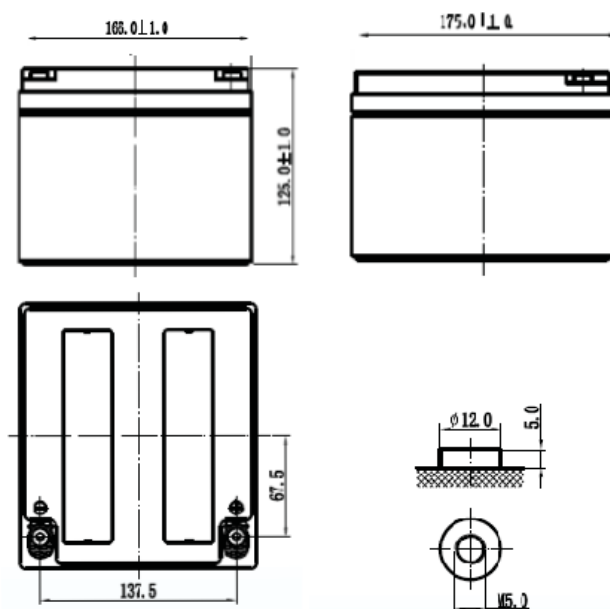
- Absorbent Glass Mat (AGM) technology for efficient gas recombination of up to 99% and freedom from electrolyte maintenance or water adding.
- Not restricted for air transport-complies with IATA/ICAO Special Provision A67.
- UL-recognized component.
- Can be mounted in any orientation.
- Computer designed lead, calcium tin alloy grid for high power density.
- Long service life, float or cyclic applications.
- Maintenance-free operation.
- Low self discharge.

### Battery Specification

<b>Nominal Voltage</b>	<b>12V</b>
<b>Number of cell</b>	<b>6</b>
<b>Design life</b>	<b>5 lat</b>
<b>Nominal Capacity 77°F (25°C)</b>	
20 hour rate (1,20 A; 10,5 V)	<b>24,00 Ah</b>
10 hour rate (2,20 A; 10,5 V)	<b>22,00 Ah</b>
5 hour rate (3,81; 10,5 V)	<b>19,50 Ah</b>
1 hour rate (14,4 A; 9,6 V)	<b>14,40 Ah</b>
<b>Internal Resistance</b>	
Fully Charged battery 77°F (25°C)	<b>≤15,0 mOhm</b>
<b>Self-Discharge</b>	
3% of capacity declined per month at 20°C (average)	
<b>Operating Temperature Range</b>	
Discharge	<b>-20°C—60°C</b>
Charge	<b>-10°C—60°C</b>
Storage	<b>-20°C—60°C</b>
<b>Max. Discharge Current 77°F (25°C)</b>	<b>288 A (5 s)</b>
<b>Short Circuit Current</b>	<b>1200 A</b>
<b>Charge Methods: Constant Voltage Charge 77°F (25°C)</b>	
<b>Cycle use</b>	<b>14.4—14.7 V (2,40—2,45 VPC)</b>
<b>Maximum charging current</b>	<b>9,6 A</b>
<b>Temperature compensation</b>	<b>-30 mV/°C</b>
<b>Standby use</b>	<b>13,38—13,8 V (2,23—2,3 VPC)</b>
<b>Temperature compensation</b>	<b>-20 mV/°C</b>

**Dimensions and Weight**

Length (mm / inch)	<b>175 / 6,89</b>
Width (mm / inch)	<b>166 / 6,54</b>
Height (mm / inch)	<b>125 / 4,92</b>
Total Height (mm / inch)	<b>125 / 4,92</b>
Approx. Weight (Kg / lbs)	<b>7,4 / 16,28</b>
* Weight deviation: $\pm 5\%$	

**Discharge Constant Current (Amperes at 77°F (25°C))**

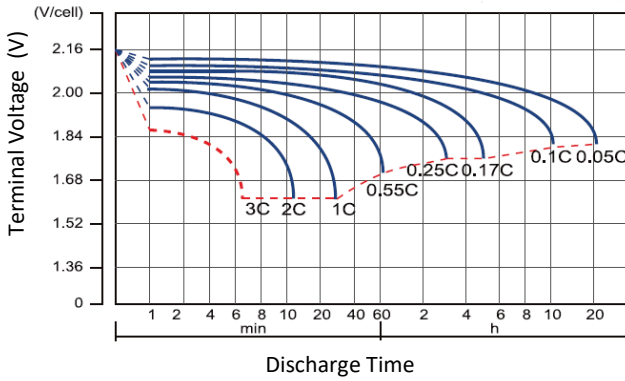
End Point Volts/Cell	5 min	10 min	15 min	30 min	45 min	1 h	3 h	5 h	10 h	20h
<b>1,60 V</b>	70,0	45,1	35,6	22,8	17,6	14,4	6,30	4,18	2,34	1,26
<b>1,65 V</b>	65,0	42,8	33,9	21,9	16,8	13,8	6,07	4,05	2,30	1,24
<b>1,70 V</b>	60,0	40,5	32,3	20,9	16,1	13,2	5,85	3,93	2,25	1,22
<b>1,75 V</b>	55,0	38,1	30,7	20,0	15,4	12,6	5,63	3,81	2,20	1,20
<b>1,80 V</b>	50,0	35,8	29,1	19,1	14,6	12,0	5,40	3,69	2,16	1,18

**Discharge Constant Power (Watts at 77°F (25°C))**

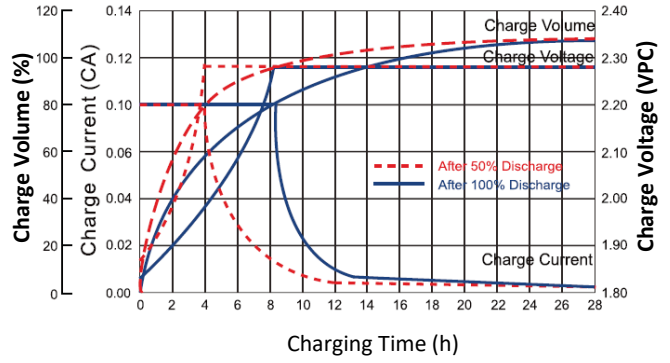
End Point Volts/Cell	5min	10 min	15 min	30 min	45 min	1 h	3 h	5 h	10 h	20h
<b>1,60 V</b>	125	80,9	65,1	43,2	35,8	27,9	12,5	7,94	4,69	2,45
<b>1,65 V</b>	118	77,0	62,2	41,5	34,1	26,8	12,0	7,78	4,62	2,41
<b>1,70 V</b>	110	73,0	59,3	39,8	32,5	25,7	11,5	7,61	4,55	2,38
<b>1,75 V</b>	103	69,1	56,4	38,0	30,8	24,6	11,1	7,45	4,48	2,34
<b>1,80 V</b>	95,0	65,1	53,5	36,3	29,1	23,5	10,6	7,28	4,41	2,30

**Note!** The above characteristics data are average values obtained within threecharge / discharge cycles. All data shall be changed without notice, AAT SYSTEMY BEZPIECZEŃSTWA sp. z o.o. reserves the right to explain and updated the information.

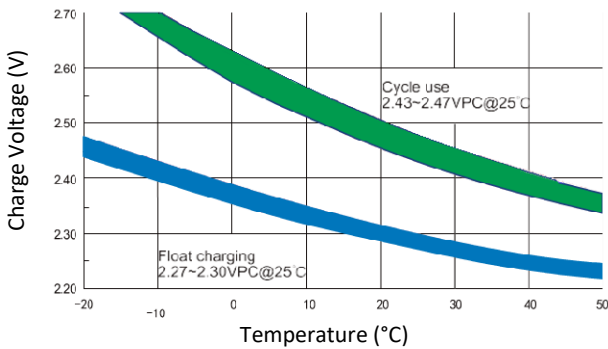
**Discharge Characteristics Curve (25°C)**



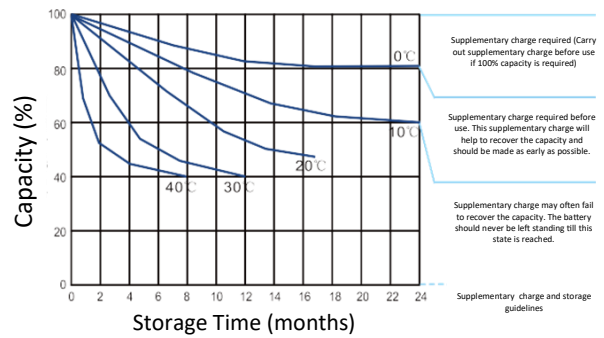
**Charge Characteristic Curve For Standby Use (25°C)**



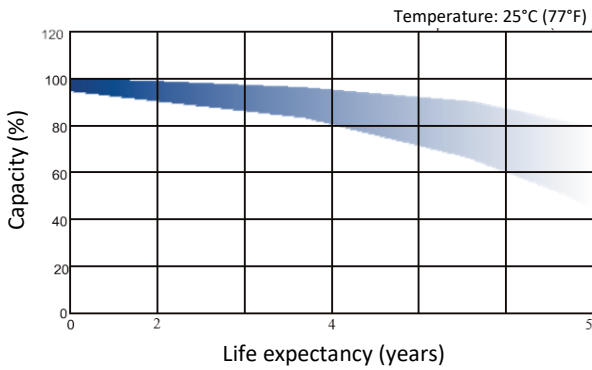
**Relationship Between Charging Voltage And Temperature**



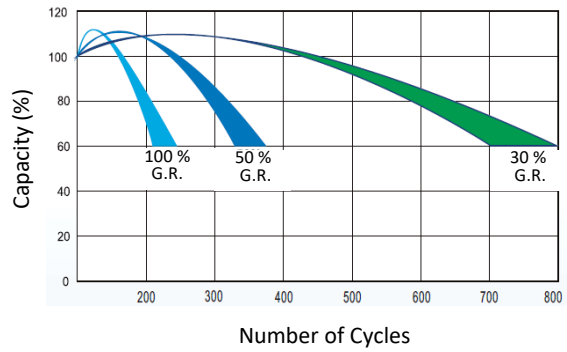
**Storage Characteristics**



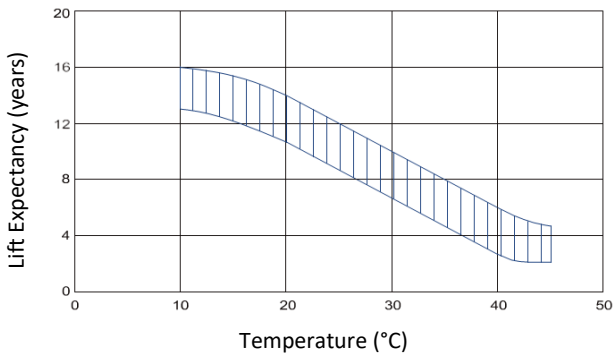
**Life Characteristics Of Standby Use**



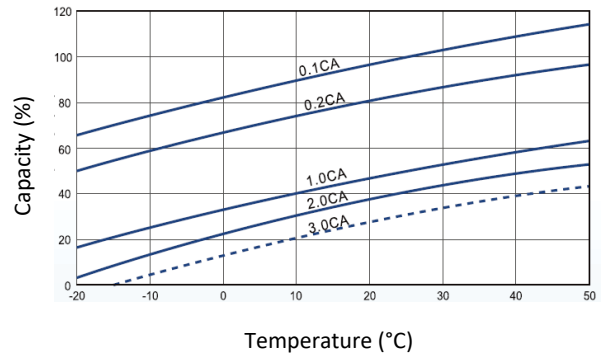
**Cycle Life in Relation To Depth Of Discharge**



**Effect Of Temperature On Long Term Life**



**Temperature Effects On Capacity**



## Notes

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