



BATTERIES



VRLA-GEL BATTERIES

- URG SERIES- GENERAL PURPOSE GEL
- URFG SERIES- FRONT TERMINAL GEL
- URCG SERIES- DEEP CYCLE GEL



ULTRA VRLA-GEL BATTERY FEATURES

INTRODUCTION

ULTRA VRLA Gel batteries are based on true gel technology which has more than a half century experience. This type of battery contains gel electrolyte primarily produced by the homogeneous distributed SiO_2 in a diluted sulfuric acid named gel SOL with thixotropic properties. The special designed vent valves are also used to control the gassing and water losing rate. Since no maintenance is required and valve regulated, they are classified as one type of VRLA batteries (The other type is VRLA-AGM batteries).

After 5 years of development, **ULTRA** now has built up two series and 40 gel battery models, from 2V to 12V in the voltage range, and from 24Ah to 3500 Ah in the capacity range, which can be used for general purpose application (named as URG Series) and Telecom/UPS application with front terminal (named as URFG Series). **ULTRA** can produce batteries from scratch and is capable of engineering tools and molds upon customer's special requests.

FUNDAMENTAL BASICS OF VRLA GEL BATTERIES:

What is gel?

Gel is usually produced by homogeneous dispersion of pyrogenic silica in diluted sulfuric acid. Pyrogenic silica is a kind of powder of very well dispersed SiO_2 , which absorbs more than 10 times its weight in liquid, producing gel. Because of the thixotropic properties of gel (liquid by stirring and solid by resting), after a certain gelling time, the agglomerates are connecting themselves together to form a network which keeps the liquid inside and gives the gel structure. This form can be broken by stirring to single agglomerates giving again a liquid form.

Main difference from AGM batteries

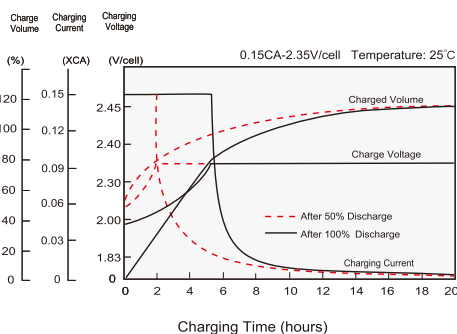
- Using gel SOL as electrolyte
- Using the extra microporous separator which can reduce the depolarization of the negative electrode and avoid the PCL 3 effect (premature capacity loss due to negative plate sulphation); significantly decreasing thermal runaway; during deep discharge or pole reversal, helps to prevent short circuits by dendrite growth between the plates
- Plate thickness tolerance is not critical since the high compression of plate group assembly is not required
- More electrolytes for better contact with plates and active materials and container walls, good for releasing internal heat and cooling battery temperature
- Better vent valve design to lower gassing rate and water losing rate to extend battery lifetime



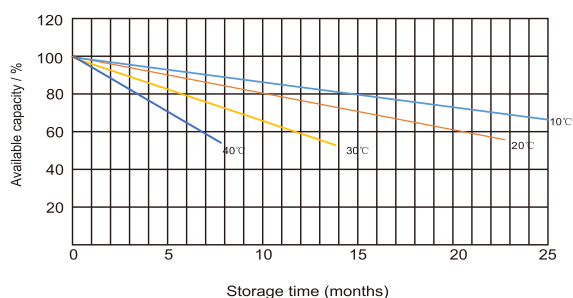
ADVANTAGE OF GEL BATTERIES

- No electrolyte adjustment needed
- Do not need quick recharging after discharging
- Insensitive to occasional deep discharge. Deep discharging resistance is high and much higher than in case of AGM since AGM has less electrolyte (only about 66% in comparison to gel)
- Extremely low gas extrication during charging
- Low self-discharge: 50% of the nominal capacity after a 12 months' storage in room temperature
- High charge acceptance
- High energy at low temperature
- Higher operating reliability and longer lifetime, as mistakes due to wrong maintenance will not occur
- The tendency to thermo-runaway-effect is strongly reduced for gel batteries since the higher electrolyte content than AGM (b/c the contact between plates and container walls for heat dispersion through the surrounding gel)
- Can be stored and used in upright or on side position (side position may give less capacity)
- No pollution problems if container is damaged
- Approved for air transport (IATA)
- Almost no acid stratification which can occur in AGM and conventional wet cells, especially on the tall batteries
- Self-resealing valves with adapter to reduce severe water losing and extend battery life
- Low cost rate (cost vs. life time and cost vs. Cycles)

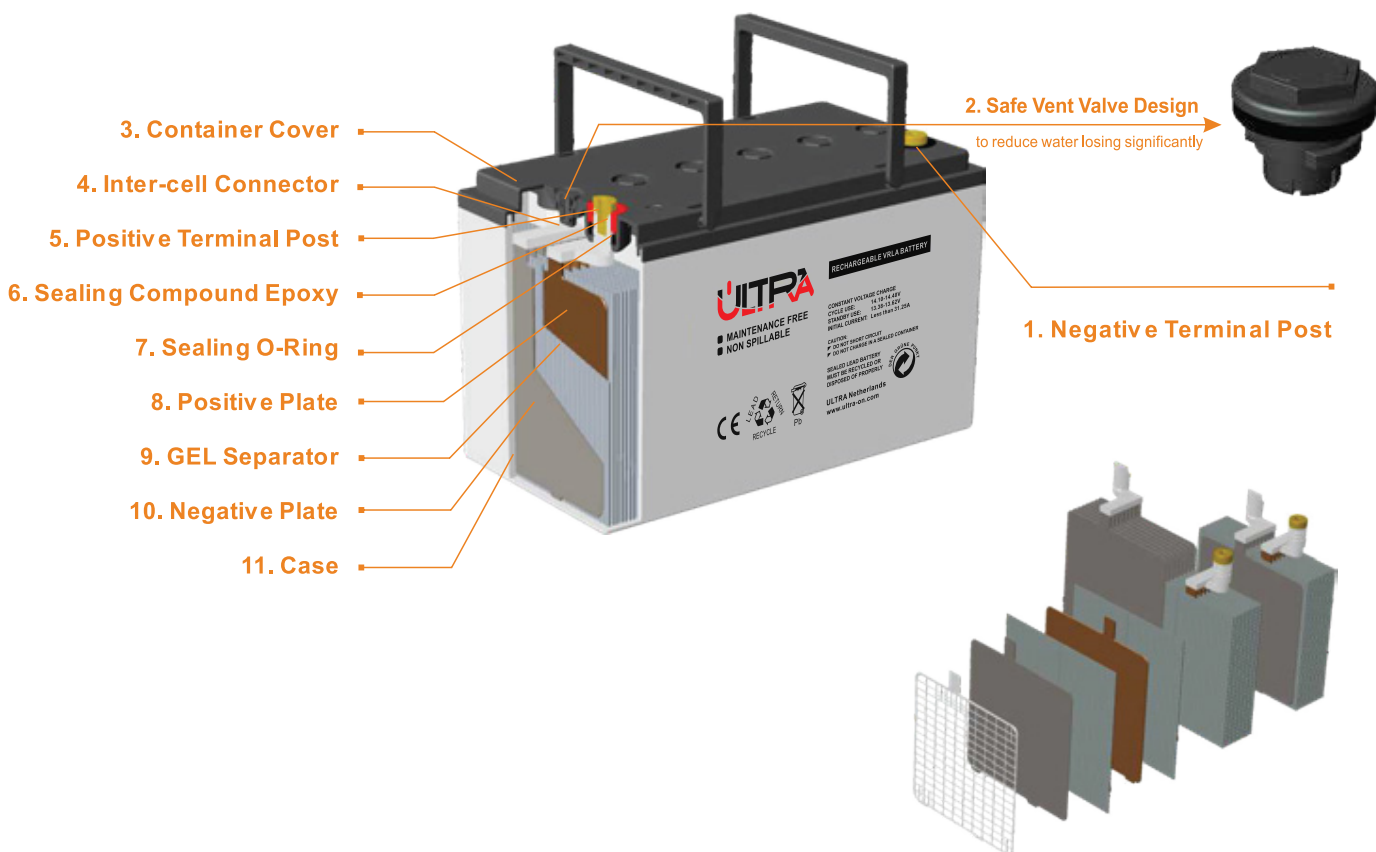
Charging Characteristics



Self Discharge Characteristics

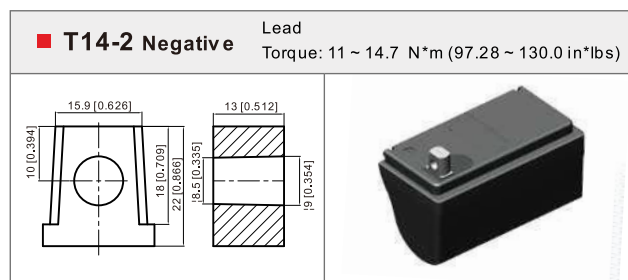
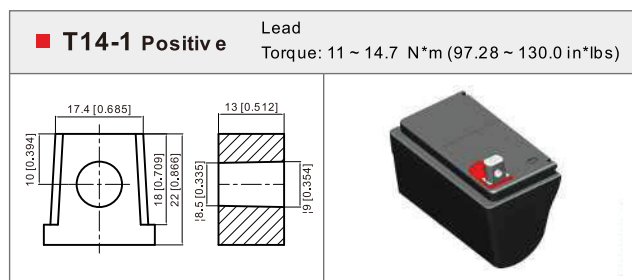
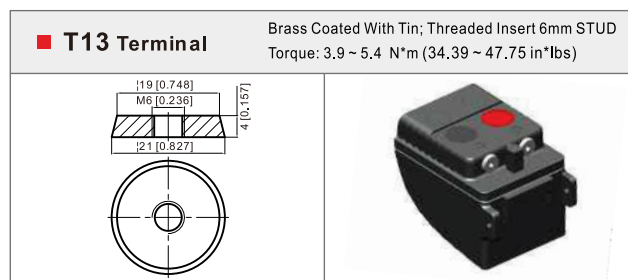
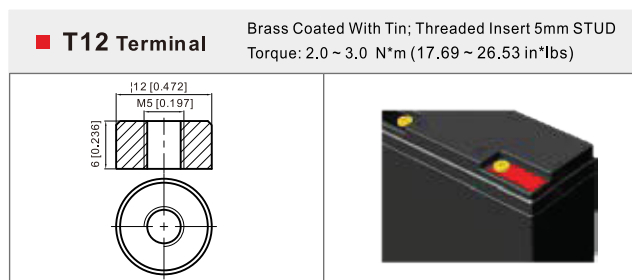
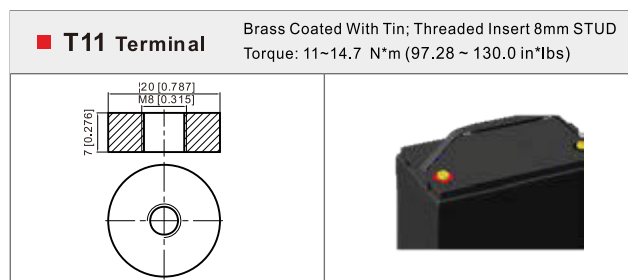
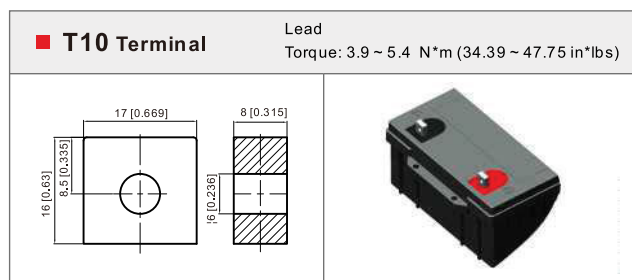
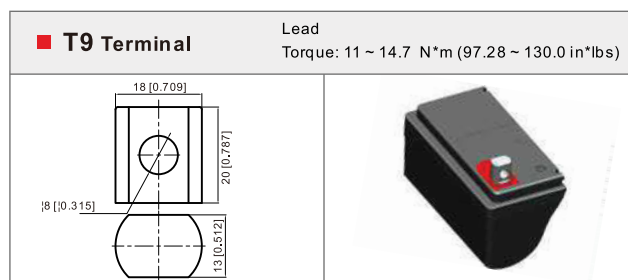
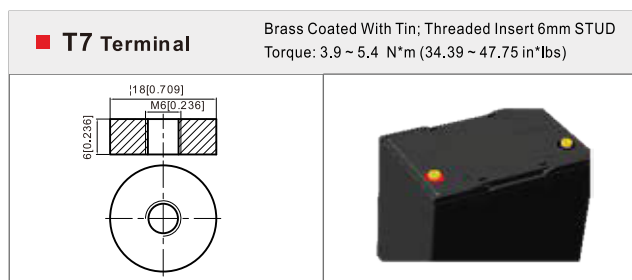
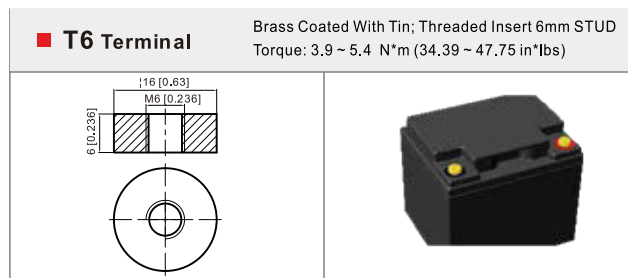
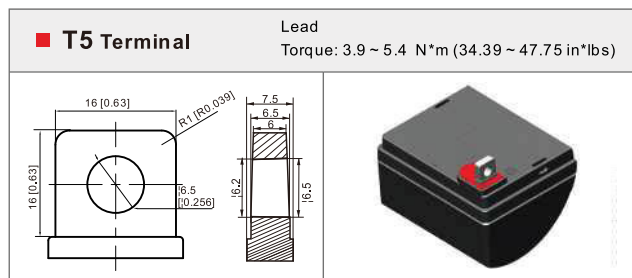


VRLA GEL BATTERY CONSTRUCTION



ULTRA VRLA-GEL BATTERY TERMINAL OPTIONS

Unit: mm[inch]



Note: the figures below just show the appearance and dimension. For the positioning on each battery model, please check the specification on www.leoch.com.

VALVE REGULATED LEAD-ACID GEL BATTERY, RECHARGABLE



URG SERIES - GENERAL PURPOSE GEL



ULTRA

URG SERIES -GENERAL PURPOSE GEL

General Features

- ♦ Long discharge time
- ♦ Suitable for standby power and energy storage power use
- ♦ Special plate design, long cycle lifetime
- ♦ Using special lead-calcium alloy to boost up the grid anti-corrosive performance and extend the battery using lifetime
- ♦ Special separator to boost up the battery internal performance
- ♦ High thermal capacity, reduce the risk of thermal runaway and drying up, can be used in poor environment
- ♦ High gas recombination efficiency
- ♦ Little water losing, no electrolyte stratification phenomenon
- ♦ Long storage time
- ♦ Good deep discharge resilience performance
- ♦ Using nano-fumed silica, with small particle size, and big specific surface area

Typical Applications

- 1) Cycle applications
- ♦ Golf trolleys ♦ Garden equipments ♦ Portable equipments ♦ Wheel chairs ♦ Solar and wind mill units
 - ♦ Medical equipments ♦ Flash units also for mining (head flash) ♦ Portable video/radio ♦ Military ♦ Railway crossing
 - ♦ Traffic lights ♦ Street signs ♦ Boats or buoys ♦ Cottage camping ♦ SOS pillars ♦ Toys and hobby applications
 - ♦ Portable equipments for communication, testing, distance measuring etc. ♦ Pump system
- 2) Standby applications
- ♦ Telecommunication backup ♦ Power plants ♦ Burglar alarms ♦ Medical equipments (stationary and portable i.e. X-ray) ♦ Computer back-up (high power) ♦ Communication systems ♦ Fire alarm systems ♦ Transmitter systems
 - ♦ Cash register systems ♦ Emergency lights signal systems ♦ Telephone systems ♦ Clocks systems ♦ Uninterrupted power supplies ♦ Elevators emergency power supply (skyscrapers) ♦ Solar applications ♦ Mobile stations
 - ♦ Airport / runway emergency illumination ♦ Emergency power supply for hospitals ♦ Radar and satellite stations

URG Models and Parameters (Small, Middle Size)

Model	Rated Voltage (V)	Rated Capacity (Ah)	Approx Dimension								Approx Weight		Terminal type
			Length		Width		Height		Total Height				
		20HR											
		1.80V /cell	mm	in.	mm	in.	mm	in.	mm	in.	kg	lbs	
URG12-17	12	17	181.5	7.15	76.5	3.01	167.5	6.59	167.5	6.59	5.8	12.8	T12(M5)
URG12-24	12	24	166	6.54	175	6.89	125	4.92	125	4.92	8.5	18.7	T12(M5)
URG12-31	12	30	195	7.68	130	5.12	164	6.46	178	7.01	10.2	22.5	T5
URG12-38	12	38	197	7.76	165	6.50	170	6.69	170	6.69	12.8	28.2	T6(M6)
URG12-45	12	45	257	10.1	132	5.20	200	7.87	200	7.87	15.5	34.2	T6(M6)
URG12-50	12	50	229	9.02	138	5.43	205	8.07	211	8.31	16.1	35.5	T6(M6)
URG12-60	12	60	255	10.0	170	6.69	174.5	6.87	177.5	6.99	18.5	40.8	T6(M6)



Model	Rated Voltage (V)	Rated Capacity (Ah)	Approx Dimension								Approx Weight		Terminal type
			Length		Width		Height		Total Height				
		20HR											
		1.80V /cell	mm	in.	mm	in.	mm	in.	mm	in.	kg	lbs	
URG12-65	12	65	325	12.8	167	6.57	174	6.85	174	6.85	20.5	45.2	T6(M6)
URG12-70H	12	70	260	10.2	168	6.61	208	8.19	214	8.43	22.9	50.5	T6(M6)
URG12-85	12	85	306	12.0	168	6.61	208	8.19	214	8.43	27.5	60.6	T6(M6)
URG12-100	12	100	330	13.0	173	6.81	212	8.35	218	8.58	31.2	68.8	T11(M8)
URG12-110	12	110	408	16.1	177	6.97	225	8.86	225	8.86	34.5	76.1	T11(M8)
URG12-120	12	133.6	345	13.6	172	6.77	274	10.8	280	11.0	40.0	88.2	T11(M8)
URG12-140	12	140	483	19.0	170	6.69	238.5	9.39	238.5	9.39	43.8	96.6	T11(M8)
URG12-160	12	160	522	20.6	240	9.45	218	8.58	224	8.82	57.5	126.8	T11(M8)
URG12-200	12	200	522	20.6	240	9.45	218	8.58	224	8.82	62.3	137.3	T11(M8)
URG12-240	12	240	522	20.6	268	10.6	220	8.66	226	8.90	73.3	161.6	T11(M8)

URG Models and Parameters (2V Series)

Model	Rated Voltage (V)	Rated Capacity (Ah)	Approx Dimension								Approx Weight		Terminal type
			Length		Width		Height		Total Height				
		10HR											
		1.80V /cell	mm	in.	mm	in.	mm	in.	mm	in.	kg	lbs	
URG 2-100	2	100	170	6.69	72	2.83	205	8.07	214	8.43	6.0	13.2	T6(M6)
URG 2-200	2	200	170	6.69	110	4.33	328	12.9	337	13.3	13.5	29.8	T11(M8)
URG 2-300	2	300	170	6.69	150	5.91	330	13.0	339	13.3	19.1	42.1	T11(M8)
URG 2-400	2	400	210	8.27	175	6.89	330	13.0	339	13.3	27.0	59.5	T11(M8)
URG 2-500	2	500	240	9.45	175	6.89	327.5	12.9	338	13.3	32.8	72.3	T11(M8)
URG 2-600	2	600	300	11.8	175	6.89	330	13.0	340	13.4	39.0	86.0	T11(M8)
URG 2-800	2	800	410	16.1	175	6.89	330	13.0	340	13.4	50.6	111.6	T11(M8)
URG2-1000	2	1000	475	18.7	175	6.89	328	12.9	328	12.9	65.7	144.8	T11(M8)
URG2-1500	2	1500	403	15.9	354	13.9	339	13.3	349	13.7	94.8	209.0	T11(M8)
URG2-2000	2	2000	490	19.3	350	13.8	339	13.3	349	13.7	132.5	292.1	T11(M8)

REASONABLE PRICE

RELIABLE QUALITY

TIMELY DELIVERY

FRIENDLY SERVICE

Specifications subject to change without notice.



URFG SERIES - FRONT TERMINAL GEL



URFG SERIES - FRONT TERMINAL GEL

General Features

- ◆ Specifically ideal for 19 inches or 23 inches power cabinets
- ◆ Front terminals make the installation, maintenance and supervision easy
- ◆ Shield designs protect terminals from short circuit and show good appearance
- ◆ Unique vent valve design: reduce water losing and prevent air/spark going inside
- ◆ Thick plates, special formula of paste and plate manufacturing process for a long service life
- ◆ ABS material: increase the strength of battery container (Flame-retardant ABS is optional)
- ◆ Long discharge time
- ◆ Suitable for standby power and energy storage power use
- ◆ Special plate design, long cycle life
- ◆ Using special lead-calcium alloy to boost up the grid anti-corrosive performance and extend the battery using life
- ◆ Special separators boost up the battery internal performance
- ◆ High thermal capacity, reduce the risk of thermal runaway and drying up, can be used in poor environment
- ◆ High gas recombination efficiency
- ◆ Little water losing, no electrolyte stratification phenomenon
- ◆ Long storage time
- ◆ Good deep discharge resilience performance
- ◆ Use nano-fumed silica, with small particle size, and big specific surface area

URFG Models and Parameters

Typical Applications

- ◆ For standard 19 inches or 23 inches power cabinets
- ◆ Network connection equipment of communication system
- ◆ Power system of special network or local area network
- ◆ UPS, standby power supply
- ◆ Power station systems
- ◆ Railway and marine systems

Model	Rated Voltage (V)	Rated Capacity (Ah)		Approx Dimension								Approx Weight		Terminal type
				Length		Width		Height		Total Height				
		10HR	20HR											
URFG12-70	12	65	70	564	22.2	114	4.49	187	7.36	187	7.36	26.7	58.9	T6(M6)
URFG12-100H	12	90	95	394	15.5	110	4.33	285	11.2	285	11.2	35.0	77.2	T6(M6)
URFG12-150	12	130	138	551	21.7	110	4.33	288	11.3	288	11.3	47.4	104.5	T6(M6)
URFG12-180	12	150	160	550	21.7	125	4.92	281.5	11.1	281.5	11.1	51.8	114.2	T13(M6)

Specifications subject to change without notice



URCGSERIES - DEEP CYCLE GEL



URCGSERIES -DEEP CYCLE GEL

General Features

- ◆ For longer cycle life: special paste formula , over dimensioned negative plate, optimised manufacturing process , additives for deep discharge
- ◆ Special anti-vibration design (optional)
- ◆ Thick plates, special formula of paste and plate manufacturing process for a long service life
- ◆ ABS material: increase the strength of battery container (Flame-retardant ABS is optional)
- ◆ Long discharge time
- ◆ Suitable for standby power and energy storage power use
- ◆ Special plate design, long cycle life
- ◆ Using special lead-calcium alloy to boost up the grid anti-corrosive performance and extend the battery using life
- ◆ Special separators boost up the battery internal performance
- ◆ High thermal capacity, reduce the risk of thermal runaway and drying up, can be used in poor environment
- ◆ High gas recombination efficiency
- ◆ Little water losing, no electrolyte stratification phenomenon
- ◆ Long storage time
- ◆ Good deep discharge resilience performance

URCG Models and Parameters

Typical Applications

- ◆ Vehicle in place of walking
- ◆ Power system of special network or local area network
- ◆ Power station systems
- ◆ Golf trolleys and golf carts
- ◆ UPS, standby power supply
- ◆ Railway and marine systems

Model	Rated Voltage (V)	Rated Capacity (Ah)		Approx Dimension								Approx Weight		Terminal type
				Length		Width		Height		Total Height				
		20HR	10HR									mm	in.	
URCG 12-24	12	24	22.6	166	6.54	175	6.89	125	4.92	125	4.92	8.5	18.7	T12(M5)
URCG 12-30	12	30	27.6	195	7.68	130	5.12	164	6.46	178	7.01	10.2	22.5	T5
URCG 12-40	12	38	35	197	7.76	165	6.50	170	6.69	170	6.69	12.8	28.2	T6(M6)
URCG 12-55	12	55	50	229	9.02	138	5.43	205	8.07	211	8.31	16.1	35.5	T6(M6)
URCG 12-60	12	60	55	255	10.0	170	6.69	174.5	6.87	177.5	6.99	18.5	40.8	T6(M6)
URCG 12-65	12	65	60	325	12.8	167	6.57	174	6.85	174	6.85	20.5	45.2	T6(M6)

Specifications subject to change without notice.



BATTERY CARE AND MAINTENANCE



Influence of Temperature

These Gel batteries are designed to operate within a temperature range between -30°C and $+50^{\circ}\text{C}$. Below -15°C , there is a risk of freezing the equipment. On the other hand it is possible to use the batteries at lower temperatures, under specific conditions (contact your representative). The use of VRLA batteries at high temperatures affects their service life. The service life is divided by factor 2 for an increasing of temperature of 10°C . The optimum operating temperature is 20°C .

The battery temperature affects the available capacity (please refer to the chart on this subject in each series). Above 35°C , the increasing of capacity is negligible.

Top-charge and precautions

Any VRLA-GEL battery will be damaged by continually undercharging or overcharging (Capacity is reduced and life is shortened), although **ULTRA** batteries accept a charge very well due to their low internal resistance. Overcharging is extremely harmful to any VRLA battery because of the sealed design. Overcharging dries out the electrolyte by driving the oxygen and hydrogen out of the battery through the pressure relief valves which will lead to less capacity and shorter lifetime. If a battery is continually undercharged, a barrier layer of sulfate will build up on the negative plate which will impact recharging acceptability. Premature plate shedding can also happen. Performance is reduced and life is shortened.

It is critical that a charger be used that limit voltage. The charger must be temperature-compensated to prevent under or overcharging due to ambient temperature changes (Please refer to the table titled as "**Charge Voltage and Temperature Ranges**" on Page 3). The warranty is void if improperly charged. Use a good constant potential, temperature-compensated, voltage-regulated charger. Constant current chargers should never be used on VRLA-GEL batteries.

Maintenance for Battery Storage

The location in which the batteries are being stored must be clean and well maintained.

Appropriate inventory turnover, will ensure the highest operating quality of the products.

Prior to installation the battery casings must be cleaned, never use solvents or abrasives.

For longer storage periods, checking the open circuit voltage (OCV) at the following intervals is recommended:

Storage at 20°C : after a storage period of 12 months, then charge batteries every 3 months afterwards.

Storage at 30°C : after a storage period of 6 months, then charge batteries every 2 months afterwards.

Specifications subject to change without notice.





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