

TUBULAR GEL VRLA BATTERIES

Solar Applications



HBL Power Systems Limited is an acknowledged leader in the field of specialized batteries and DC power systems. A strong R & D focus and a broad product range enables HBL offer its customers the appropriate technology suited for their applications.

Requirements of photovoltaic applications

Charge input from solar arrays is insufficient to keep the batteries fully charged. During sun-less days, batteries are discharged but not charged. These conditions result in battery operating in Partial State of Charge (PSOC), Cycling and Deep cycling. Also, solar systems are installed in open atmosphere exposing the batteries to extreme temperatures. Other lead acid batteries fail in such conditions due to sulphation, stratification, corrosion and plate shedding. Moreover, remote solar installations make water top-up difficult and costs money.

To meet such rigors of usage, HBL introduces a maintenance free (no water top-up) "Tubular Gel VRLA battery" with the technology that is a perfect fit for solar applications

Design & Construction

▶ Positive Plate

Tubular Plate with lead-calcium-tin alloy spine grid and woven polyester gauntlet.

▶ Negative Plate

Flat pasted plate with lead-calcium alloy grid and long life expander material.

▶ Separator

Micro porous plastic separator.

▶ Electrolyte

Sulfuric acid, immobilized as Thixotropic Gel.

▶ Container & Cover

Polypropylene, flame retardant is optional.

▶ Valve

Self-resealing, Pressure-regulating and Explosion-proof with flame arrestor.

▶ Terminals

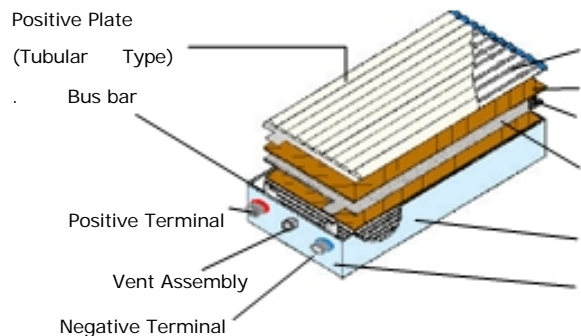
Epoxy sealed terminals with threaded lead-plated inserts.

▶ Steel trays

Acid resistant, epoxy coated, stackable boxes for easy installation.

▶ Connectors

Lead plated solid copper connectors.



Only VRLA battery with high pressure die-cast spine grids

Features & Benefits

- ▶ **Tubular positive plates**
Proven cycling and deep cycling capabilities
- ▶ **Gelled electrolyte**
No Stratification and no failure due to PSOC
- ▶ **Pre-filled and charged**
Ready to use, easier to install
- ▶ **Valve regulated**
No water additions during service life
- ▶ **Antimony - free alloy**
Long shelf life with very low self-discharge
- ▶ **High pressure die-cast spine grids**
Takes longer time for grid to corrode
- ▶ **No free acid**
Safe and economical transportation
- ▶ **No risk of thermal runaway**
Good heat dissipation as gelled electrolyte is in contact with plates and container
- ▶ **Ready to install**
100% capacity on first discharge
- ▶ **Tubular and Gel combination**
Very good deep discharge recovery
- ▶ **Versatile in mounting arrangement**
Can be mounted both in horizontal and Vertical orientation



Performance

Parameter	2 Volt Single Cell	12 Volts Monobloc
Design Float Life at 27°C	20 years	16 years
Cycle Life at 27°C @ 80% DOD	1800 Cycles	1200 Cycles
Cycle Life at 27°C @ 20% DOD	5200 Cycles	3500 Cycles
Self Discharge	<2% per month at 27°C	
AH Efficiency	> 95%	
WH Efficiency	>85%	
Operating Temperature	-20° C to +55° C	

Certifications

- ▶ ISO 9001 certified quality management system
- ▶ ISO 14001 certified environment management system
- ▶ IEC 60896-2 certified by CSA (Canadian Standards Association)
- ▶ UL recognized components

Applicable Standards

- ▶ IEC 61427 (Batteries for solar photovoltaic systems)
- ▶ IEC 60896-2 (Stationary Lead Acid batteries)
- ▶ DIN 43539, T5 (Proof against deep discharge)



There are three basic types of VRLA batteries
- AGM thick plate,
AGM thin plate and Tubular Gel

HBL NIFE is the only Manufacturer in India to make all three types

Only Manufacturer of Tubular Maintenance Free batteries in India
(No water top-up)

On/Off Type

▶	Over Voltage disconnect	: 2.370 ± 0.005 V/Cell at 27 C
▶	Array Re-connection Voltage	: 2.250 ± 0.005 V/Cell at 27 C
▶	Low Voltage disconnect	: 1.850 ± 0.005 V/Cell at 27 C
▶	Load Reconnect Voltage	: 2.080 ± 0.005 V/Cell at 27 C
▶	Regulation Voltage	: 2.350 ± 0.005 V/Cell at 27 C
▶	Low Voltage disconnect	: 1.850 ± 0.005 V/Cell at 27 C
▶	Load Re-connection Voltage	: 2.080 ± 0.005 V/Cell at 27 C

Product Specifications

Model	Monobloc/ Module Voltage	Nominal Capacity (Ah) at C ₁₀	Discharge current in Amps				Monobloc/Module Dimensions & Weights			
			120Hr	72Hr	48Hr	24Hr	Length (+10mm)	Width (+10mm)	Height (+10mm)	Weight (approx)

12 Volt Monoblocs

12 TGI 40	12	40	0.5	0.8	1.1	2.1	410	174	221	27
12 TGI 60	12	60	0.8	1.1	1.7	3.1	410	174	221	33
12 TGI 80	12	80	1.1	1.5	2.2	4.1	526	221	226	48
12 TGI 100	12	100	1.3	1.9	2.8	5.2	526	221	226	54

2 Volt Cells

2 TGI 120	16	120	1.6	2.3	3.3	6.2	635	445	213	96
2 TGI 160	16	160	2.1	3.0	4.4	8.3	883	445	215	135
2 TGI 200	12	200	2.7	3.8	5.5	10.3	801	445	215	119
2 TGI 240	12	240	3.2	4.6	6.6	12.4	870	445	215	133
2 TGI 280	8	280	3.7	5.3	7.8	14.5	661	445	215	133
2 TGI 300	8	300	4.0	5.7	8.3	15.5	789	445	215	120
2 TGI 320	8	320	4.2	6.1	8.9	16.5	789	445	215	123
2 TGI 360	8	360	4.8	6.8	10.0	18.6	893	445	213	139
2 TGI 400	8	400	5.3	7.6	11.1	20.7	893	445	213	146
2 TGI 440	6	440	5.8	8.3	12.2	22.7	781	445	215	121
2 TGI 500	6	500	6.6	9.5	13.8	25.8	825	445	215	130
2 TGI 600	6	600	8.0	11.4	16.6	31.0	652	705	215	195
2 TGI 1000	6	1000	13.3	19.0	27.7	51.7	1018	606	219	240

* Nominal Capacity is at a discharge rate of 10 Hrs to an end cell voltage of 1.80 V at 27° C

* Other special designs & configuration of the battery system for specific application shall be provided on request

* In accordance with its policy of continuous improvement the company reserves the right to change specification and designs without notice. Illustrations, data, dimensions and weights given in this brochure are for guidance only and cannot be held binding on the company

Registered. Office, Tel: +91-40-23355575, Fax: +91-40-23355048, e-mail: contact@hblnife.com.
 Noida, Tel: +91-120-2433181 to 85, Fax: +91-120-432738, e-mail: delhi@hblnife.com,
 Mumbai, Tel: +91-22-39120300 - 07, Fax: +91-22-39121300, e-mail: mumbai@hblnife.com,
 Chennai Tel: +91-44-26261329, Fax: +91-44-26200073, e-mail: chennai@hblnife.com,
 Lucknow, Tel: +91-522-2610555, Fax: +91-522-2635208, e-mail: lucknow@hblnife.com,
 Kolkatta, Tel: +91-33-23599174/23218060, Fax: +91-33-23599173, e-mail: calcutta@hblnife.com,
 Bangalore, Tel: +91-80-51130303, Fax: +91-80-51130306, e-mail: bangalore@hblnife.com,
 Hyderabad, Tel: +91-8418-244640 (10 lines), Fax: +91-8418-244627/244574, e-mail: hyderabad@hblnife.com.
 Also at Bhopal, Bhubneshwar, Guwahati, Ranchi, Baroda, Haridwar & Udampur



HBL Power Systems Ltd.

Road # 10, Banjara Hills, Hyderabad - 500 034, India.

E mail: contact@hbl.in

www.hbl.in