

PULSE

hd+

HEAVY DUTY | ZERO MAINTENANCE

COMPACT – HIGH PERFORMANCE – RELIABLE – COST SAVER

Heavy Earth Moving Machinery



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Requirements of an Engine Starting battery

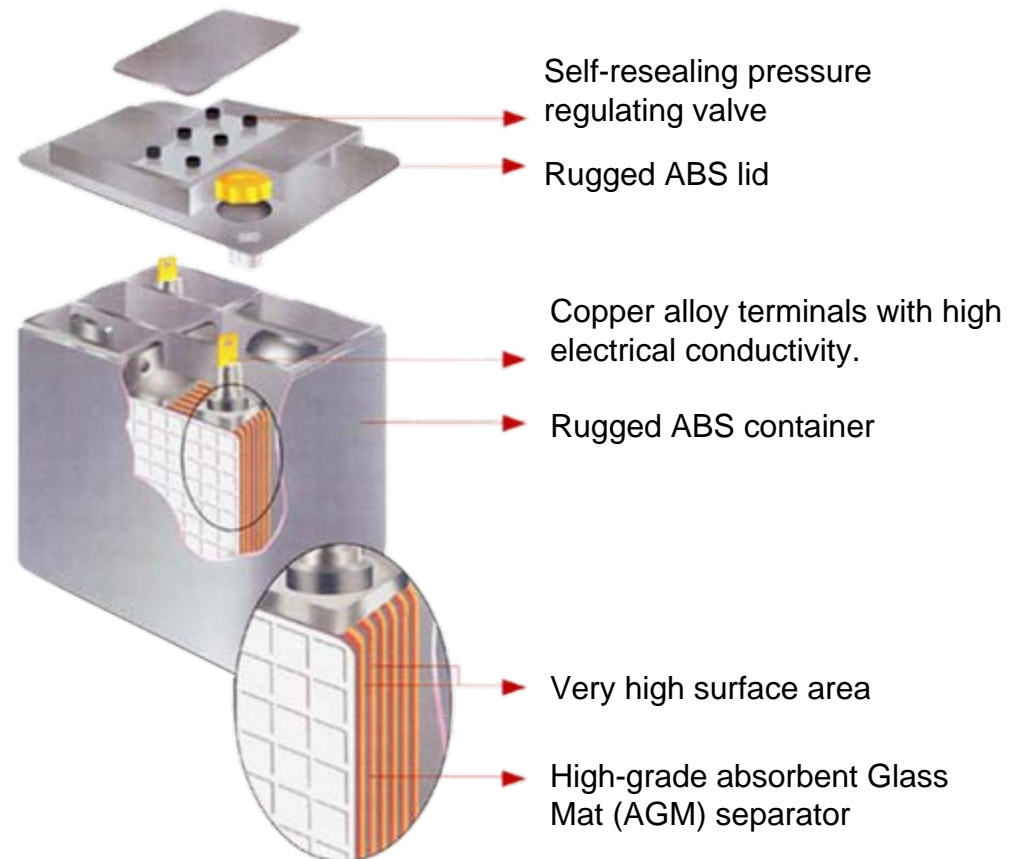
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|-----------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">▪ High cranking current capability |
| <ul style="list-style-type: none">▪ Ability to crank cold engines or engines in idle condition for long time |
| <ul style="list-style-type: none">▪ Good high & low temperature performance |
| <ul style="list-style-type: none">▪ Compact & light weight |
| <ul style="list-style-type: none">▪ Faster recharge capability |
| <ul style="list-style-type: none">▪ No emission of corrosive fumes |
| <ul style="list-style-type: none">▪ Long life, both in storage & working. |

Important Customer requirements

Customer Requirement	Flooded Battery	Pulse hd+ Battery
Reliability of Starting	Satisfactory	Excellent
No Electrolyte adjustment	Adjustment required frequently	Maintenance-free
Readiness for use	Needs electrolyte filling and charging at site	Ready to use (filled & charged)
Ease of installation	Needs careful handling, possibility of acid spillage	Easy to install with no risk of acid spillage and very lightweight.
Ease of Maintenance	Difficult (acid top-up, sp. Gr adjustment)	No special maintenance
Low temperature performance	Generally not recommended below -10°C	Can work satisfactorily up to -40°C

Pulse hd+ - Heavy Duty. 'Zero Maintenance' Battery

- Pure Lead-Tin thin plate Valve Regulated Lead-acid (VRLA) battery
- Unmatched peak power performance.
- Awesome starting capability
- Reliable starting even under the most adverse operating conditions.
- Most preferred choice for critical applications requiring high performance, reliability and long life



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Product Technology

- Product design used in applications like Battle tank starting and aircraft starting
- Normally flooded type lead calcium alloys with thicker grids are used in battery.
- Battery uses **Pure Lead-Tin thin plate** technology & contains 99.9% pure lead.
- Calcium, antimony etc. improves grid rigidity but increases positive grid corrosion hence thicker plates for longer life sacrificing energy density & high discharge.

Pure Lead Tin Vs Other Lead Acid Batteries

Pure Lead-Tin

- Very high surface area.
- Very low corrosion in acid medium.
- Can be cast as thin grids without affecting life.
- Improved cycle life.

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PLT Battery

- First introduced in the mid 1980's and fully established by mid 1990's
- Made only by 4 manufacturers in the world
 - Hawker / Enersys (UK)
 - Northstar (USA) – limited rang
 - Optima (USA) – very limited range for SLI
 - HBL NIFE (India) – very wide range
- PLT Alloy properties
 - Has very low corrosion in acid medium
 - Can be cast as thin grids without affecting life
 - Addition of small quantity of tin improves cycle life
- PLT Batteries – Superior features
 - High cranking current capability/ discharge capability with minimal voltage drop
 - Wide operating temperature range
 - Excellent re-charge capability – low internal resistance
 - Compact & light weight
 - No emission of corrosive fumes
 - Long life (both in storage & working) – low self discharge

Comparison of Lead-acid battery technologies

Parameter	Conventional Flooded	Thick Plate AGM	Pulse hd+	Remarks
Grid Alloy	Typically Lead-antimony or lead-calcium	Typically lead-calcium	Pure lead-Tin (PLT)	PLT has least corrosion rate & longer life
Grid Thickness	4-5 mm approx	3-4 mm approx	0.6 to 1 mm approx	Thin grids have better efficiency of raw material utilization
Electrolyte	Flooded & mobile	Starved & absorbed	Starved & absorbed	No spillage or leakage if electrolyte is absorbed
Separator	Generally Polyethelene	AGM	AGM	AGM has dual role of insulator & electrolyte holder
Water loss	Occurs & regular topping up reqd	Negligible. No water top up	Negligible. No water top up	Gas recombination inside cell in AGM tech
Internal resistance	Very High	High	Low	Low Internal resistance gives high discharge, good re-charge capability
Active material shedding	Occurs	Does not occur	Does not occur	Active material shedding leads to short circuit after some time
Recharge efficiency	Low	Average	Excellent	Thin plate batteries can recharge to 90% capacity in 1 hour
Self discharge	Very High	Medium	Low	Longer storage life

Cranking currents

Parameter	Brief Description	Flooded (Normal Battery)	Thin Plate AGM (Pulse Battery)
Cold Cranking amperes (CCA)	Amps a battery can deliver for 30 sec at 0°F (-18°C) to a battery end voltage of 1.2V per cell	2.5 A / Ah	11 A / Ah
Marine Cranking Amperes (MCA)	Amps a battery can deliver for 30 sec at 32°F(0°C) to a battery end voltage of 1.2V per cell	4.4 A / Ah	15.5 A / Ah
Hot Cranking Amperes (HCA)	Amps a battery can deliver for 30 sec at 80°F(26.7°C) to a battery end voltage of 1.2V per cell	5.5 A / Ah	20 A / Ah

Features & Benefits

Maintenance free VRLA design –

Sealed system requires No Battery topping up or specific gravity checks. No flowing electrolyte and hence No spillage of battery acid and no corrosion or sulphation of battery terminals

Ready to use –

Compact & light weight for easy handling, Occupies very little space and is Filled & factory charged

Reliability –

Thin plate's gives more surface area reduced internal resistance hence high power capability for guaranteed starting, faster recharging and Consistent performance throughout battery life


































Shelf Life –

Low self discharge provides extended storage capability while maintaining high state of charge for dependable operation

Features & Benefits

- **Cranking currents –**
 - Up to 300% higher cold cranking ampere (CCA) than conventional flooded batteries
- **Longer life –**
 - More starting cycles
- **Excellent low temperature performance –**
 - Performance tested at -40°C ambient
- **Shock & vibration resistant –**
 - Ideal for rough terrain. Sealed system hence can be installed in any angle
- **Warranty –**
 - 12 months from date of installation
- **Meets IEC 60095 specification**

'Value Added' technology comparison

Features of Value to customer	Flooded	Thick Plate AGM	Pulse hd+
High Power Capability			
Readiness for use			
Non-spill ability			
Quick recharge capability			
Compact & light weight			
Non-emission of corrosive fumes			
No top up			
Performance at low ambient temp			
Cost effectiveness			
No sudden death			
Ease of handling & installation			

Product Specifications

Comparison of Pulse hd+ Battery with typical conventional battery						
Pulse hd+ Model	Capacity Ah	Dimensions (mm)			CCA	Approx. Wt. (Kgs)
		L	W	H		
AX1006972	100	410	175	240	1100	36.0
Typical Equivalent Flooded Battery	200	521	292	250	850	62.0

Pulse hd+ Model	Capacity Ah	Dimensions (mm)			CCA	Approx. Wt. (Kgs)
		L	W	H		
AX1006973	160	525	220	250	1650	48.0
Typical Equivalent Flooded Battery	2x180/200	2x521	2x292	2x250	1660	2x62.0

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Pulse hd+ Model	Capacity Ah
Ax1006972	100
MRP (Rs.)	10950.00*
Replaces Flooded	180
MRP (Rs.) Min:	12386.00

APPLICATIONS		
Vehicle Type	OEM	Model
<u>Dumpers</u>	BEML HM	35-T BH-35 35-T 1035
<u>Dozer</u>	BEML	300HP- BD30W / D80 / D50
<u>Excavator</u>	L&T Telcon BEML	3.9 cu.m 300CK 2.3 cu.m EX400 / EX300/ 600/ KH500// TFC280/EX200LC-1/EX210/LCH- V/EX100 2.2 cu.m BE 300
<u>Crane</u>	BEML Telcon	20T CM-20 100T KH500
<u>Loader</u>	BEML Escorts	4.5 cu.m BL40 3.8 cu.m BL 3035 JCB
<u>Grader</u>	BEML	280 HP GD825 R2

* - MRP is indicative and subject to change.

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HBL PLT SMF Model	Capacity Ah
AX1006973	160
MRP (Rs.)	17400.00*
Replaces Flooded	2x180/200
MRP (Rs.) 180/200Ah Min: Max	16476.00 29036.00

APPLICATIONS		
Vehicle Type	OEM	Model
Dumper	BEML	85-T BH-85

* - MRP is indicative and subject to change.

GIANT 85-T BEML DUMPER BH-85



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THE BATTERY

2 X Pulse hd+ 160-12A

REPLACES FLOODED

4 X 12V 180/200Ah



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CAUTION

- ❖ Sophisticated products need to be used and sold with care.
- ❖ Pulse hd+ batteries will work on standard vehicle based charging systems. If the charger regulator malfunctions, damage to the battery may be irreversible.
- ❖ To charge Pulse hd+ batteries when not on vehicles, Constant Potential Chargers must be used.

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Quality Assured

- Battery conforms to IEC 60095
- Rugged ABS plastic lid and container
- Best available high purity raw materials
- Automated production facility
- Comprehensive testing prior to despatch

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IMPORTANT INSTRUCTIONS

Pulse hd+ Batteries are Sealed and Maintenance Free. They do not require water top up during their lifetime.

On receipt check battery:	<ol style="list-style-type: none"> 1. For Damage / Leakages 2. OCV – New factory charged 12V battery will have an Open Circuit Voltage (OCV) >12.85V <p><u>In case of damage / leakages / Low OCV Inform CSS immediately</u></p>
During Storage	<ol style="list-style-type: none"> 1. Batteries stored over long periods lose charge due to “self-discharge” resulting in loss of capacity. 2. Check OCV of batteries once a month. 3. Whenever the battery OCV approaches 12.5V a freshening charge is required. Charge the battery in Constant Voltage (CV) mode at 14.4V for a 12V battery with a current limit of 0.2 C20 for 14hrs.
During Installation.	<ol style="list-style-type: none"> 1. Ensure battery is properly secured in cradle. 2. Tighten electrical connections properly to avoid loose contacts. 3. Check fan belt and electrical wiring. 4. Dynamo / alternator setting should be 13.8V to 14.2V.
During Use:	<p>Check regularly to ensure:</p> <ul style="list-style-type: none"> ▪ Battery is not loose in cradle. ▪ Condition of fan belt & wiring. ▪ Proper dynamo / alternator setting. ▪ Have battery checked at least once in 6-months by our authorized representative

Thank you