



Deka Motive Power Batteries & Two Volt Cells in Photovoltaic Applications

WARRANTY (10 year limited warranty)

East Penn Manufacturing Co., Inc. (referred to as "EPM") guarantees Deka Motive Power Batteries manufactured and shipped in approved EPM packaging against defective materials and workmanship for a period of ten (10) years from the date of shipment when used in the United States according to the chart to the right.

<i>FLOODED</i>		
Full	Pro-rata	Total
36 months (3 year)	84 months (7 years)	120 months (10 years)
<i>GEL</i>		
Full	Pro-rata	Total
12 months (1 year)	108 months (9 years)	120 months (10 years)

If upon initial inspection, installation, and adequate charge, (a) the battery fails to meet the published 20-hour performance ratings to 1.75 vpc per BCIS-14 and the latest EPM catalog data at the time of shipment or (b) the user identifies flaws in materials or workmanship that would impair life or product performance, the user will be instructed to:

1. Upon written approval, return the product for examination, or
2. Hold the materials on site pending inspection by an EPM representative.

Upon satisfactory proof of claim, as determined solely by EPM, EPM will repair or, at its option, replace any defective battery. A defect in material or workmanship is defined as failure to reach at least 50% of its rated capacity at the 20-hour rate. If a properly maintained battery fails to meet 50% of its rated capacity, as determined by an EPM approved capacity test (conductance, resistance, or impedance values cannot be used as a substitute for a capacity test), EPM will (a) repair parts, cells, or battery at its expense for both labor and parts, (b) furnish a suitable replacement battery having a rated capacity equal or greater than the published rated capacity of the battery returned, or (c) issue a credit toward the purchase of another Deka Motive Power battery based upon the following formula:

$$\left(\frac{\text{Current Equivalent Price (at time of claim)} \times \text{Months in Service}}{\text{Warranty Period (Months)}} \right) = \text{Replacement Cost}$$

The replacement battery shall only be warranted for the remaining unused portion of the original warranty of the replaced battery. The original battery will become the property of EPM. The owner of the battery will be responsible for delivery of the battery to EPM's nearest authorized representative or factory as directed by the EPM product support department. The use of a rental battery is not part of this warranty.

TERMS AND CONDITIONS

1. The user is responsible for determining that each battery is of the proper size, design, and capacity to perform properly at time of purchase.
2. Warranty is not transferable and is applicable only to the "Original Purchaser."
3. This warranty shall be void if batteries are subjected to misuse, abuse, unauthorized product alteration, or any other physical damage other than ordinary wear or if manufacturing codes are destroyed.
4. Warranty claims for full replacement must be made within three (3) months from time of tested failure or alleged defect.
5. Purchaser must discontinue the use of the battery after discovery of a defect.
6. The cost for removal of the warranted product, installation of replacement product, material freight charges, and travel expenses of EPM representatives will be the responsibility of the purchaser.
7. The charger/rectifier must be temperature compensated. The average battery temperature shall not exceed 115 degrees F (46 degrees C.) nor drop below 50 degrees F. (10 degrees C).
8. User must maintain charger settings to meet EPM's photovoltaic battery charging parameters identified below:

Photovoltaic Battery Charging Parameters (25°C)

Max. Current – Bulk Charge - amps (single cell design)
 Constant Voltage – Absorption (Regulation) Charge
 Constant Voltage - Float Charge
 Constant Voltage – Equalize Charge
 Temperature Coefficient =

Motive Power (Flooded)

20% of the 20 hr. amp-hour rate
 2.40 – 2.45 vpc
 2.30 – 2.35 vpc
 2.50 – 2.55 vpc
 -3 mV / cell / °C1

Photovoltaic Battery Charging Parameters (25°C)

Max. Current – Bulk Charge - amps (single cell design)
 Constant Voltage – Absorption (Regulation) Charge
 Constant Voltage - Float Charge
 Constant Voltage – Equalize Charge
 Temperature Coefficient =

Motive Power (Gel)

20% of the 6 hr. amp-hour rate
 2.37 – 2.42 vpc
 2.25 – 2.30 vpc
 2.43 – 2.48 vpc
 -3 mV / cell / °C1

Cut-off parameters per charge and equalize intervals are application specific and will vary dependant upon site specific characteristics such as temperature, days of autonomy, array to load ratio, etc..

9. The battery is intended to supply power for a limited number of discharge cycles. Depth of Discharge (DoD) will affect number of cycles over the life of the product. Battery systems shall be sized in accordance to East Penn recommendations. Battery systems sized for 3 days of autonomy shall be limited to 50% DoD (16.7% maximum daily DoD). Battery systems sized for 5 days of autonomy or greater shall be limited to 80% DoD (16% maximum daily DoD).
10. Any storage of this battery shall be at an ambient temperature of 77°F (25°C), or less, and user shall give a freshening charge to all cells every three months prior to installation in accordance with EPM's published installation and operating instructions.
11. Batteries must be located in a manner that the individual cells do not vary by more than 5°F (2.8°C) between the lowest and highest individual cell temperatures.
12. The life of the battery is affected by the Operating Temperature. For every 13°F (7°C) increase in operating temperature above 77°F (25°C), the warranty period will be proportionally reduced by 50% as shown below:

Operating Temp	Proportional % of Life	Warranty Period	Total Period
77°F	100%	1.0 yr. full / 9 yrs. Pro-rata	10 years (120 months)
81°F	80%	.8 yr. full (10 months) / 86 months pro-rata	8 years (96 months)
87°F	60%	.6 yr. full (7 months) / 65 months pro-rata	6 years (72 months)
90°F	50%	.5 yr. full (6 months) / 54 months pro-rata	5 years (60 months)

14. Upon installation and at least once a year thereafter, purchaser (user) must complete and maintain record of a Battery Maintenance Report recording cell serial numbers, Charge voltage and charge current settings, surface temperatures, cell and connection resistances/conductances, ambient environment temperature, etc. in accordance with EPM's Installation and Operation Manual. The inability to produce such documents at the time of warranty consideration may result in the voiding of any applicable warranty. **Records must indicate the battery was operated in accordance with EPM's published instructions.**

LIMITATIONS

This express warranty is the buyer's sole remedy and shall be subject to all terms and conditions herein. All other warranties, whether expressed or implied, including but not limited to implied warranties or merchantability and fitness for a particular purpose, are disclaimed. **THIS WARRANTY DOES NOT COVER LOSS OF TIME, INCONVENIENCE, DAMAGE TO ANY PROPERTY, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.**


YOUR MK BATTERY DISTRIBUTOR
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