



Deka Flooded Monoblock Batteries in Photovoltaic & Cyclic Service Applications

SOLAR WARRANTY

East Penn Manufacturing Co., Inc. (referred to as "EPM") guarantees Deka flooded monoblock batteries manufactured and shipped in approved EPM packaging against defective materials and workmanship beginning upon the date of shipment for the period based upon model number established in the chart to the right.

Model Number	Full	Pro-rata	Total
DC27, 8C-11, 9C-11, 7T-31	12 months	12 months	24 months (2 years)
GC15	24 months	36 months	60 months (5 years)
8L16	24 months	60 months	84 months (7 years)

If upon initial inspection, installation, and adequate conditioning charges, (a) the battery fails to meet the published 20-hour performance ratings to 1.75 vpc per 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 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 shall be made within three (3) months from time of tested failure or alleged defect.
5. Purchaser shall discontinue the use of the battery after discovery of a safety 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 shall be temperature compensated. The average battery temperature should never be allowed to exceed 105 degrees F (40.5 degrees C) for more than an eight (8) hour period.
8. User shall maintain charger settings to meet EPM's photovoltaic battery charging parameters identified below:

Photovoltaic Battery Charging Parameters (25°C)	Flooded Monoblock
Max. Current – Bulk Charge - amps	30% of the 20 hr. amp-hour rate
Constant Voltage – Absorption (Regulation) Charge	2.40 – 2.45 vpc
Constant Voltage - Float Charge	2.30 – 2.35 vpc
Constant Voltage – Equalize Charge	2.50 – 2.55 vpc
Temperature Coefficient =	3 mv / deg. C per cell

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 batteries every three months prior to installation in accordance with EPM's published installation and operating instructions.
11. Batteries shall not be continuously operated below 50°F (10°C) or above 95°F (35°C) unless temperature compensated via thermocouple monitoring of the temperature at the battery.
12. Batteries shall be located in a manner that the individual batteries do not vary by more than 5°F (2.8°C) between the lowest and highest individual battery temperatures.

13. 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:

BATTERY TYPES: DC27, 8C-11, 9C-11, 7T-31

Operating Temp	Proportional % of Life	Warranty Period	Total Period
77°F	100%	1.0 yr. full (12 mo.) / 1.0 yr. (12 mo.) pro-rata	2.0 years (24 mo.)
81°F	80%	.8 yr. full (10 mo.) / .8 yr. (10 mo.) pro-rata	1.6 years (20 mo.)
87°F	60%	.6 yr. full (7 mo.) / .6 yr. (7 mo.) pro-rata	1.2 years (14 mo.)
90°F	50%	.5 yr. full (6 mo.) / .5 yr. (6 mo.) pro-rata	1.0 year (12 mo.)

BATTERY TYPE: GC15

Operating Temp	Proportional % of Life	Warranty Period	Total Period
77°F	100%	2.0 yr. full (24 mo.) / 3.0 yr. (36 mo.) pro-rata	5.0 years (60 mo.)
81°F	80%	1.6 yr. full (19 mo.) / 2.4 yr. (29 mo.) pro-rata	4.0 years (48 mo.)
87°F	60%	1.2 yr. full (14 mo.) / 1.8 yr. (22 mo.) pro-rata	3.0 years (36 mo.)
90°F	50%	1.0 yr. full (12 mo.) / 1.5 yr. (18 mo.) pro-rata	2.5 years (30 mo.)

BATTERY TYPE: 8L16

Operating Temp	Proportional % of Life	Warranty Period	Total Period
77°F	100%	2.0 yr. full (24 mo.) / 5.0 yr. (60 mo.) pro-rata	7.0 years (84 mo.)
81°F	80%	1.6 yr. full (19 mo.) / 4.0 yr. (48 mo.) pro-rata	5.6 years (67 mo.)
87°F	60%	1.2 yr. full (14 mo.) / 3.0 yr. (36 mo.) pro-rata	4.2 years (50 mo.)
90°F	50%	1.0 yr. full (12 mo.) / 2.5 yr. (30 mo.) pro-rata	3.5 years (42 mo.)

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

EAST PENN manufacturing co., inc.

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