



## Batteries and Cells in Renewable Energy Applications

### WARRANTY

East Penn Manufacturing Co., Inc (referred to as "EPM") guarantees Deka Unigy II 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 according to the following chart:

<u>Full</u>	<u>Pro-rata</u>	<u>Total</u>
12 mos. (1 yrs.)	108 mos. (9 yrs.)	120 mos. (10 yrs.)

If upon initial inspection, installation, and adequate float charge, (a) the battery fails to meet the published 8-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 the 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 80% of its rated capacity. If a **properly maintained** battery fails to meet 80% 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 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 Unigy II battery per the following formula:

$$\frac{\text{Current List Price}}{\text{Warranty Period (Months)}} \times \text{Months in Service} = \text{Replacement Cost}$$

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 safety or performance defect that may further damage the battery.
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. Charger must be able to sustain the system voltage within  $\pm 0.5\%$  of the desired level at all times and must be within the limits of EPM's published instructions. - Acceptable charging ripple (peak to peak) shall be less than .5% of the manufacturer's recommended string float voltage and have a duration shorter than eight (8) milliseconds.
8. The battery is intended to supply limited number of discharge cycles. Maximum daily depth of discharge shall not exceed 40% of the 8 hour A.H capacity rating.
9. 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 six months prior to installation in accordance with EPM's published installation and operating instructions.
10. Batteries must not be continuously operated below 50°F (10°C). Batteries must not be operated above an average temperature of 95°F, and never above 105°F for more than an 8 hour period.
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.

<u>Operating Temp.</u>	<u>Warranty Period</u>	<u>Total Period</u>
25°C / 77°F	1 yr. full / 9 yr. pro-rata	10 years
27°C / 81°F	1 yr. full / 4 yr. pro-rata	5 years
30°C / 87°F	1 yr. full / 1.5 yr. pro-rata	2.5 years
32°C / 90°F	1 yr. full / 0 yr. pro-rata	1 year
13. User must set charger settings to meet EPM's photovoltaic battery charging parameters

<u>UnigyII Photovoltaic Battery Charging Parameters (25°C)</u>	
Maximum Current – <b>Bulk Charge</b> (Amps)	20% of 6 Hour Rate
Constant Voltage – <b>Absorption</b> (Regulation) Charge	2.30 – 2.35 vpc (Max c5 rate)
Constant Voltage – <b>Float</b> Charge	2.25 – 2.30 vpc
Constant Voltage – <b>Equalize</b> Charge	2.35 – 2.40 vpc
Temperature Coefficient	-0.005 mv/°C per cell
<i>Cut-off parameters per charge and equalize intervals application specific and will vary dependant upon site specific characteristics such as temperature, days of autonomy, array to load ratio, etc...</i>	
14. Upon installation and at least twice a year thereafter, purchaser (user) must perform and maintain records of a properly completed *Battery Maintenance Report* recording cell serial numbers, cell float voltages, surface temperatures, connection resistances, ambient environment temperature, etc. in accordance with *EPM's Battery Maintenance Report and the Installation and Operation Manual*. Electronic copies of this report must be available to the Unigy Warranty Department upon request. The inability to supply such documents within the specified time periods 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 of 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.