

## Specialty

### Battery Range Summary

Since its introduction in the early 1990s, the Genesis® Thin Plate Pure Lead (TPPL) battery has established itself as a premium high performance battery suitable for a wide range of demanding applications.

Today, Genesis EP batteries are found in applications as diverse as electronics, medical equipment, telecommunications, renewable energy, computer backup and UPS applications. In addition to its superior performance characteristics, the Genesis EP battery excels in physically demanding applications such as high temperature and high vibration environments.

The TPPL technology allows the battery to pack more power into a smaller footprint. The EP brand also offers deep cycling capabilities, fast recharge abilities and a non-spillable design which allows mounting in any position except inverted.

#### Features and Benefits

- Capacity range 13 - 200Ah
- High power density
- Excellent cycle life
- Superior float life
- High stable voltage delivery
- Wide temperature range
- Rugged construction
- Fastest recharge when compare to other sealed lead batteries
- 2 year shelf life



## Construction

- 12V pure lead-tin Valve Regulated Lead Acid (VRLA) Absorbent Glass Mat (AGM) battery
- UL 94V0 flame retardant case and cover
- M6 no-maintenance terminals
- Can be installed in any orientation except inverted
- Rugged construction (optional metal jacket - G200EP excluded)
- Approved for shipping as non-hazardous, non spillable (refer to SDS sheet)

## Installation and Operation

- -40°F (-40°C) to 176°F (80°C) with optional metal jacket (G200EP excluded)
- 2 year shelf life at 77°F (25°C)
- Cycle life up to 400 cycles at 80% depth of discharge

## Standards

- Non-spillable classification
- Recognized by UL File no. MH12544 (excludes G200EP); G200EP recognized by UL File no. MH18697
- The management systems governing the manufacture of this product are ISO 9001:2008 and ISO 140001:2004 certified

## General Specifications

|              |                     | Nominal Capacity (Ah) | Nominal Dimensions |        |      |       |       |        | Typical Weight |      | Torque |     | Internal Resistance (mΩ) | Short Circuit Current (A) |
|--------------|---------------------|-----------------------|--------------------|--------|------|-------|-------|--------|----------------|------|--------|-----|--------------------------|---------------------------|
| Battery Type | Nominal Voltage (V) |                       | 10 Hr Rate-Ah      | Length |      | Width |       | Height |                |      |        |     |                          |                           |
|              |                     |                       | in                 | mm     | in   | mm    | in    | mm     | lbs            | kg   | in-lbs | Nm  |                          |                           |
| G13EP        | 12                  | 13                    | 6.89               | 175.0  | 3.27 | 83.1  | 5.08  | 129.0  | 10.8           | 4.9  | 50     | 5.6 | 8.1                      | 600                       |
| G16EP        | 12                  | 16                    | 7.12               | 180.8  | 2.99 | 75.9  | 6.57  | 166.9  | 13.5           | 6.1  | 50     | 5.6 | 6.9                      | 1000                      |
| G26EP        | 12                  | 28                    | 6.54               | 166.1  | 6.89 | 175.0 | 4.92  | 125.0  | 22.3           | 10.1 | 60     | 6.8 | 4.3                      | 1140                      |
| G42EP        | 12                  | 42                    | 7.74               | 196.6  | 6.50 | 165.1 | 6.69  | 169.9  | 32.9           | 14.9 | 60     | 6.8 | 3.8                      | 1430                      |
| G70EP        | 12                  | 72                    | 12.94              | 328.7  | 6.54 | 166.1 | 6.85  | 174.0  | 53.5           | 24.3 | 60     | 6.8 | 2.8                      | 2100                      |
| G200EP       | 12                  | 200                   | 22.87              | 580.9  | 4.92 | 125.0 | 12.46 | 316.5  | 132.3          | 59.9 | 44     | 5.0 | 3.3                      | 3800                      |

## Constant Current Discharge Performance

Constant current discharge rate, amps to 10.02V at 77°F (25°C)

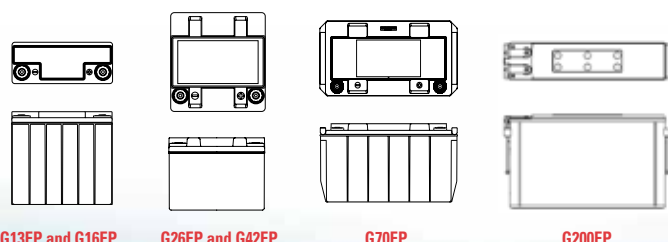
| Battery Type | Minutes |       |       | Hours |      |      |      |      |
|--------------|---------|-------|-------|-------|------|------|------|------|
|              | 10      | 15    | 30    | 1     | 5    | 8    | 10   | 20   |
| G13EP        | 41.4    | 30.8  | 17.9  | 10.3  | 2.5  | 1.6  | 1.3  | 0.7  |
| G16EP        | 49.3    | 36.6  | 21.5  | 12.6  | 3.1  | 2.1  | 1.7  | 0.9  |
| G26EP        | 87.6    | 65.4  | 38.3  | 22.1  | 5.3  | 3.5  | 2.9  | 1.5  |
| G42EP        | 118.9   | 90.3  | 54.4  | 32.1  | 8.0  | 5.4  | 4.4  | 2.3  |
| G70EP        | 218.5   | 165.7 | 98.5  | 57.0  | 13.6 | 9.0  | 7.3  | 3.9  |
| G200EP       | 475.6   | 380.4 | 241.9 | 150.8 | 36.9 | 24.3 | 19.8 | 10.4 |

## Constant Power Discharge Performance

Constant power discharge rate, watts per battery to 10.02V at 77°F (25°C)

| Battery Type | Minutes |        |        | Hours  |       |       |       |       |
|--------------|---------|--------|--------|--------|-------|-------|-------|-------|
|              | 10      | 15     | 30     | 1      | 5     | 8     | 10    | 20    |
| G13EP        | 467.0   | 348.0  | 206.0  | 120.0  | 30.0  | 20.0  | 16.0  | 9.0   |
| G16EP        | 560.0   | 421.0  | 251.0  | 149.0  | 38.0  | 25.0  | 20.0  | 11.0  |
| G26EP        | 990.0   | 749.0  | 446.0  | 260.0  | 63.0  | 42.0  | 34.0  | 18.0  |
| G42EP        | 1333.0  | 1026.0 | 629.0  | 376.0  | 96.0  | 64.0  | 52.0  | 28.0  |
| G70EP        | 2443.0  | 1879.0 | 1139.0 | 669.0  | 162.0 | 107.0 | 87.0  | 46.0  |
| G200EP       | 5148.0  | 4189.0 | 2736.0 | 1746.0 | 442.0 | 293.0 | 238.0 | 125.0 |

## Outline Drawings



G13EP and G16EP

G26EP and G42EP

G70EP

G200EP

## Charge Voltage

Cyclic use: 14.4V to 15.0V at 77°F (25°C) No current limit  
Float use: 13.5V to 13.8V at 77°F (25°C) No current limit

Drawing sizes are for terminal position reference only;  
Diagrams are not proportionate to each other



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## EP BATTERY SELECTION GUIDE

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### GENESIS® Batteries

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EnerSys® is the world's largest industrial battery manufacturer with manufacturing and assembly plants located around the world, over 7,000 employees, and a worldwide sales and distribution network.

A leader in both valve-regulated and flooded lead acid battery technologies, EnerSys is a major supplier to telecommunications, uninterrupted power supply (UPS), data processing, electronic, defence, aviation, and material handling markets across the globe.

ISO 9001 certification, covering 20 key elements, assures customers that EnerSys has fully documented and implemented manufacturing and quality systems that are consistently followed.

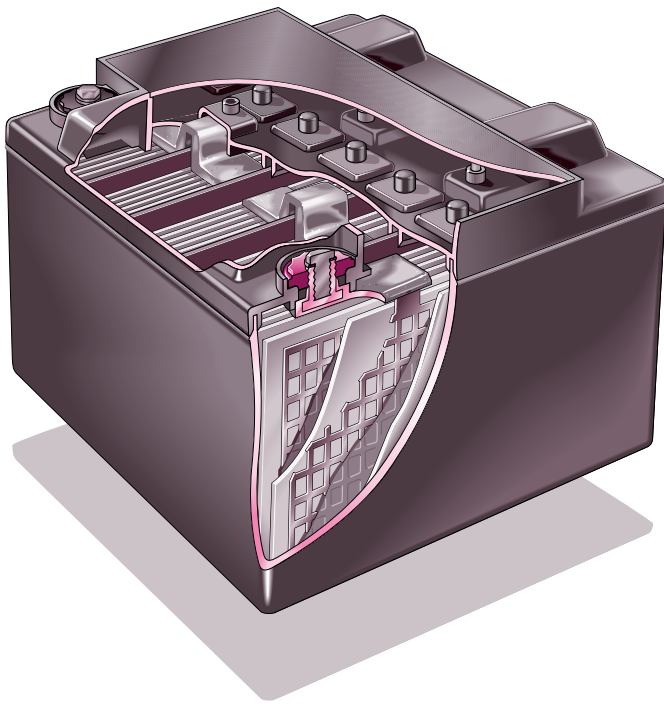
EnerSys supports its customers through global field sales offices and a select network of authorised Value Added Centres and international representatives and distributors. EnerSys offers technical support and customer service unparalleled in the industry. Additionally, the sales and support team is committed to meeting and exceeding the individual needs of each customer.



## Applications

Batteries from EnerSys' "pure lead-tin" family are used in a wide variety of standby and portable/cyclic applications including those in:

- telecommunications
- electronics
- uninterruptible power supplies
- defence installations
- computer back-up
- electric vehicles
- medical equipment
- solar power
- lawn and garden equipment



## Features and Benefits

Sealed pure-lead cells were invented by a predecessor company of EnerSys® in 1973. The purity of the materials used is key to supporting the GENESIS® battery's performance benefits. A longer service life, meaning fewer replacements and the cost associated with it, combined with higher reliability and fewer system failures, result in a lower long-term cost of ownership to the end user or equipment owner.

What are the advantages of Pure Lead technology?

1. **Power density** - Per unit weight, the power provided by pure lead-tin products offers the greatest high-rate power density for your money. GENESIS' greater volumetric power allows engineers to consider more energy-supporting features or design smaller, lighter packages.

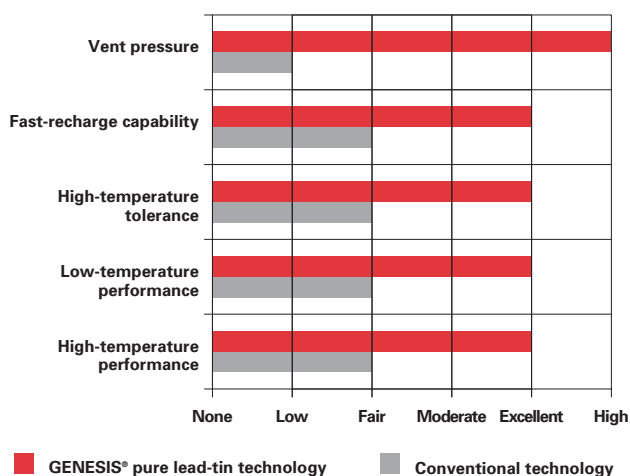
At high-rate and pulse discharges, EnerSys' GENESIS products offer the best performance value when compared with competitive product in applications at less than 100 minutes of discharge.

2. **Cycle life** - Compared to competitive lead products (offering up to 200 full cycles), pure lead-tin batteries provide 50% to 200% greater full cycle capability. GENESIS product will deliver up to 400 cycles (80% DOD, C<sub>5</sub>).
3. **Float life** - Conventional sealed-lead batteries vary greatly in specified standby life: from three to ten years at 20°C. GENESIS, however, offer 70% to 80% of rated capacity at 20°C, in a fifteen-year design life.
4. **High stable voltage delivery** - The high stable voltage delivery of a pure lead-tin battery results from its low internal resistance. The flat discharge voltage profile of our batteries, combined with our products' low internal resistance, means our batteries are able to discharge and recharge their power faster, more efficiently and offer greater application flexibility. The pure lead-tin construction also gives more watts-per-unit weight at high discharge rates.
5. **Widest temperature range** - Due to the product's strong construction and high vent pressures, these batteries will maintain their performance and physical parameters in extreme conditions. At high temperatures, the chemical reaction in a battery that causes aging is accelerated. Pure lead-tin technology resists that chemical reaction more effectively than alloyed lead, thus allowing a battery to have a longer service life. GENESIS has twice the delivered capacity of conventional sealed-lead batteries at temperatures below -20°C, offering unparalleled low-temperature performance.

GENESIS electrodes are thinner, allowing more electrodes per cell, and therefore greater electrode surface area than conventional sealed-lead, thick electrode batteries. As a result, our batteries can reach a high state of charge in fast-charging applications in one-fourth the time of conventional, sealed-lead, thick-plate batteries.

6. **Rugged construction** - Due to their strong external packaging and internal pure lead-tin composition, EnerSys' products can withstand not only extreme temperatures but also harsh usage.

### The pure lead-tin advantage



GENESIS external case for the EP product is constructed from UL 94V-0 rated non-halogenated flame-retardant materials. GENESIS products are shock and vibration resistant, designed to offer higher tolerance levels to meet demanding applications, including those in commercial and outdoor applications. The company's focus on battery-case integrity and high vent pressure, coupled with pure lead-tin's low grid-corrosion rate, means GENESIS provide the longest service life possible.

- 7. Fastest recharge** - EnerSys' pure lead-tin chemistry allows GENESIS® to offer the shortest recharge efficiency of any sealed-lead battery on the market. With pure lead-tin, you can achieve a 95% state of recharge in less than one hour - without loss of capacity or electrolyte using conventional constant-voltage charging techniques.

Flexible charging options are possible with GENESIS, as no current limit is required when using a constant voltage charger.

- 8. Orientation/placement/transport** - Due to the products' mechanical design, GENESIS can be mounted and operated in any position, except inverted, an attractive feature for less accessible areas.

GENESIS offer UL94 V-0 non-halogenated flame-retardant packaging, thus allowing the mounting of systems in sensitive areas and human environments.

GENESIS products are classified as "nonspillable batteries", and are excepted from the Department of Transportation's comprehensive packaging requirements if the following conditions are satisfied: (1) The battery is protected against short circuits and is securely packaged and (2) The battery and outer packaging must be plainly and durably marked "NONSPILLABLE" or "NONSPILLABLE BATTERY".

GENESIS batteries have been tested and determined to be in compliance with the vibration and pressure differential tests contained in 49 CFR § 173.159(d).

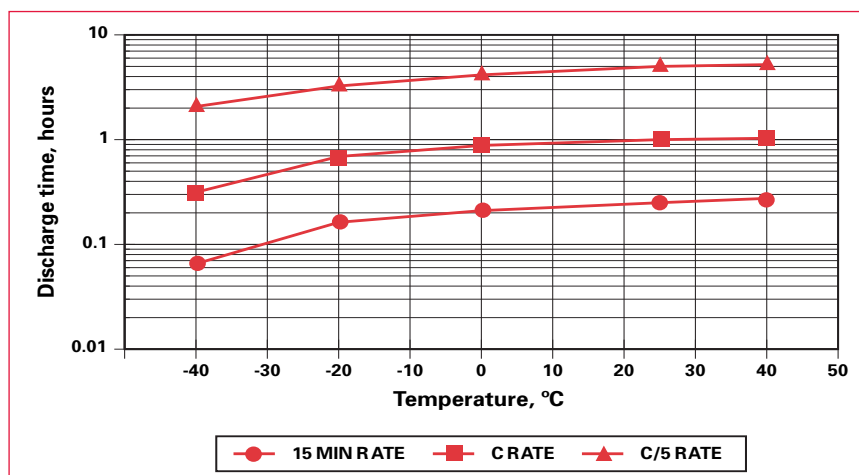
Because GENESIS are classified as "Nonspillable" and meet the conditions from § 173.159(d) they do not have an assigned UN number nor do they require additional DOT hazard labeling.

All batteries that have been tested and determined to be in compliance with the DOT Hazardous Material Regulations, the International Civil Aeronautics Organisation (ICAO), and the International Air Transport Association (IATA) Packaging Instruction 806 and Special Provision A67, are therefore exempt from all other requirements of these regulations and classified as a "nonspillable battery".

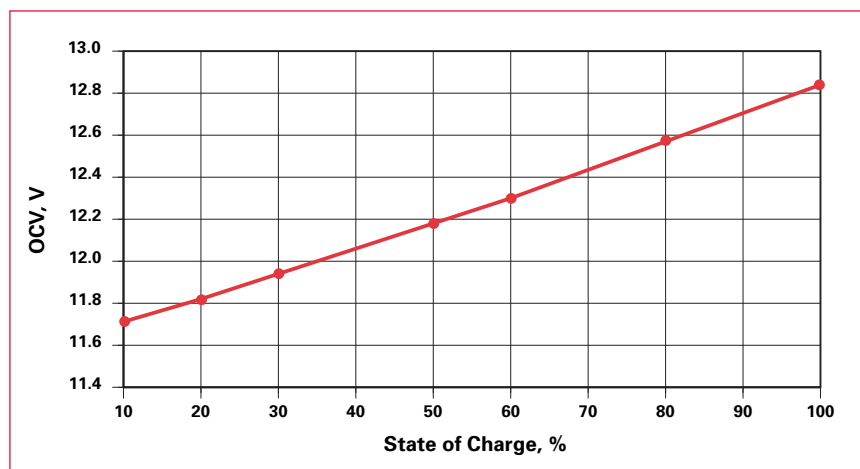
- 9. Shelf life** - Pure lead-tin batteries have an extremely low self-discharge rate, thus providing extended storage capability while maintaining high state-of-charge levels for dependable operation.

GENESIS has a shelf life more than twice that of conventional lead batteries. To assure maximum reliability, EnerSys recommends that all stored batteries be recharged (boost charged) once every 24 months or when the open circuit voltage drops to 12.00 volts per battery, whichever occurs earlier. Inventory should be checked more frequently if storage temperature regularly exceeds 25°C.

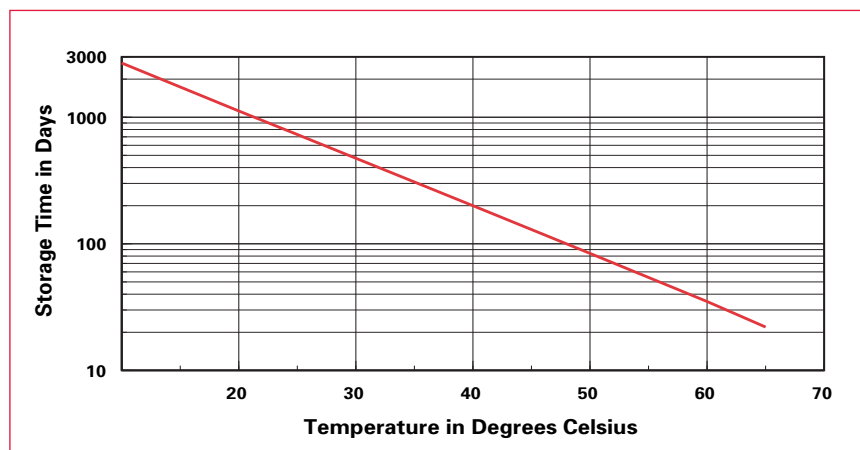
**Capacity as a function of temperature for GENESIS® Batteries**



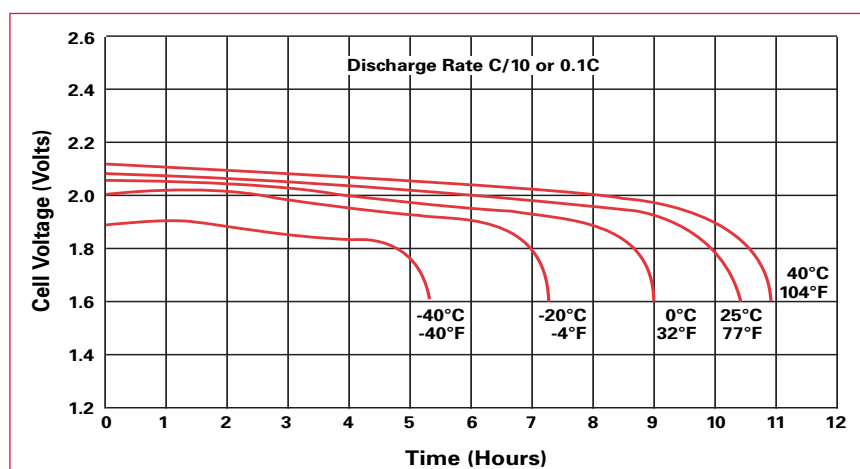
### State of charge for GENESIS® batteries



### Storage time as a function of temperature for GENESIS® batteries (Fully charged battery)



### Voltage regulation for GENESIS® batteries



### Charging recommendations:

Broadly speaking, a battery may be recharged using either a constant voltage (CV) charger or a constant current (CC) charger, or a modification of either or both of these.

The exact regime chosen generally depends upon the time and economic constraints imposed by the system. Constant current charging is widely used in cyclic applications where a recharge must be accomplished in a relatively short time period. Constant voltage charging, where a single voltage level is applied across the battery terminals, is the most suitable method to recharge GENESIS® products. Depending on the CV charger's current limit, it is possible to recharge these batteries from a 100% discharged condition to better than 95% state of charge in less than one hour, using only the cyclic charge voltage.

#### Constant voltage charging

Constant voltage (CV) charging should be within the following ranges:

Fast Chargers:

14.7 to 15.0 volts @ 25°C

NOTE: This type of charger must revert to float once 100% capacity has been retained.

Float Chargers:

13.5 to 13.8 volts @ 25°C

To avoid thermal runaway in warmer temperatures, and to improve charge acceptance in colder temperatures, the charger voltage should be compensated by approximately 18 millivolts per battery per degree centigrade variance from 25°C. This is a negative coefficient, with the voltage being lowered as the temperature increases, and vice versa.

There is no need to limit the inrush current to the battery during the initial phase of constant voltage charging. The low internal resistance of GENESIS® batteries allows for large inrush current without damage.

Since not all of the charge returned is accepted to replenish the electro-chemical potential, a good rule of

thumb to use is that the charge returned should be 105% to 110% of the capacity delivered on the previous discharge.

Voltage Ripple:  $\pm 1\%$  without battery connected.

## GENESIS® product family

### GENESIS® EP:

| Products | Capacity<br>$C_{10}$ @ 25°C<br>1.67 Vpc | Internal<br>res. of fully<br>charged cell<br>$m\Omega$ @ 25°C | Nominal<br>short circuit<br>current for<br>charged battery |
|----------|-----------------------------------------|---------------------------------------------------------------|------------------------------------------------------------|
| G13EP    | 13Ah                                    | 8.5                                                           | 1,400A                                                     |
| G16EP    | 16Ah                                    | 7.5                                                           | 1,600A                                                     |
| G26EP    | 26Ah                                    | 5.0                                                           | 2,400A                                                     |
| G42EP    | 42Ah                                    | 4.5                                                           | 2,600A                                                     |
| G70EP    | 70Ah                                    | 3.5                                                           | 3,500A                                                     |

For extreme duty: X after EP denotes a metal jacket, eg. G42EPX

## GENESIS® EP performance specifications

### Constant current discharge/amps to 1.67Vpc @ 25°C

| Products     | DURATION |        |        |        |        |        |      |      |       |       |
|--------------|----------|--------|--------|--------|--------|--------|------|------|-------|-------|
|              | 5 min    | 10 min | 15 min | 30 min | 60 min | 90 min | 5 hr | 8 hr | 10 hr | 20 hr |
| G13EP (13Ah) | 70.8     | 43.6   | 32.2   | 18.6   | 10.4   | 7.3    | 2.5  | 1.6  | 1.3   | .7    |
| G16EP (16Ah) | 90.0     | 54.8   | 40.1   | 23.0   | 12.7   | 8.9    | 3.0  | 2.0  | 1.6   | .8    |
| G26EP (26Ah) | 143.4    | 90.7   | 67.4   | 39.0   | 21.7   | 15.1   | 5.0  | 3.2  | 2.6   | 1.4   |
| G42EP (42Ah) | 212.0    | 138.4  | 104.1  | 60.8   | 33.8   | 23.5   | 7.9  | 5.1  | 4.2   | 2.3   |
| G70EP (70Ah) | 342.4    | 228.5  | 173.4  | 102.5  | 57.4   | 40.6   | 13.4 | 8.7  | 7.1   | 3.9   |

### Constant current power/watts per bloc to 1.67Vpc @ 25°C

| Products     | DURATION |        |        |        |        |        |      |      |       |       |
|--------------|----------|--------|--------|--------|--------|--------|------|------|-------|-------|
|              | 5 min    | 10 min | 15 min | 30 min | 60 min | 90 min | 5 hr | 8 hr | 10 hr | 20 hr |
| G13EP (13Ah) | 758.4    | 481.8  | 361.2  | 231.6  | 121.2  | 85.8   | 29.4 | 19.2 | 15.6  | 8.4   |
| G16EP (16Ah) | 975.6    | 609.6  | 453.6  | 264.6  | 190.2  | 105.0  | 36.0 | 23.4 | 19.2  | 10.2  |
| G26EP (26Ah) | 1532     | 995    | 751    | 444    | 251    | 175.8  | 59   | 38   | 31    | 16    |
| G42EP (42Ah) | 2291     | 1540   | 1173   | 698    | 394    | 276    | 94   | 62   | 51    | 28    |
| G70EP (70Ah) | 3680     | 2519   | 1940   | 1173   | 670    | 486    | 161  | 105  | 86    | 47    |

### Charging/Temperature/Life:

| Products                      | CHARGING VOLTAGE |              | TEMPERATURE RANGE   |                | LIFE EXPECTANCY                     |                    |
|-------------------------------|------------------|--------------|---------------------|----------------|-------------------------------------|--------------------|
|                               | Cyclic           | Float        | Storage & discharge | Charge         | C <sub>50</sub> Cycle life 100% DOD | Float life at 20°C |
| G13EP, G16EP<br>G26EP & G42EP | CV 14.7-15.0     | CV 13.5-13.8 | -40°C to +45°C      | -40°C to +45°C | 400                                 | 15 years           |
| G70EP                         | CV 14.7-15.0     | CV 13.5-13.8 | -40°C to +60°C      | -40°C to +60°C | 400                                 | 10 years           |

**Atmospheric pressure range** - Vacuum to 2 atmospheres

**Terminal attachment torque for G13EP & G16EP** - (5.6 Nm)

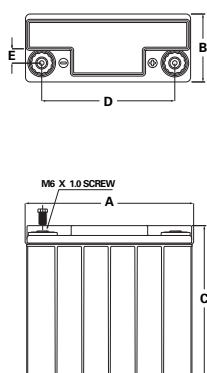
**Terminal attachment torque for G26EP & G42EP** - (6.8 Nm)

*\*Users planning to use CC should consult the EnerSys Application Support Department*

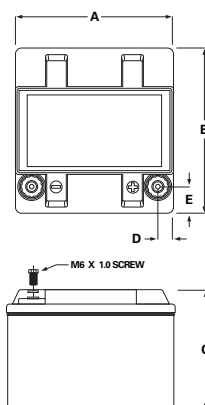
## GENESIS® EP mechanical specifications (A, B & C - Maximum)

| Products | DIMENSIONS |         |         |         |         | Weight<br>kg |
|----------|------------|---------|---------|---------|---------|--------------|
|          | A<br>mm    | B<br>mm | C<br>mm | D<br>mm | E<br>mm |              |
| G13EP    | 175.5      | 83.4    | 129.9   | 141.2   | 20.6    | 4.9          |
| G13EPX   | 177.7      | 85.5    | 131.2   | 141.2   | 20.6    | 5.4          |
| G16EP    | 181.6      | 76.3    | 167.8   | 145.8   | 16.9    | 6.1          |
| G16EPX   | 184.6      | 78.9    | 169.3   | 145.8   | 16.9    | 6.7          |
| G26EP    | 166.7      | 175.7   | 125.9   | 16.3    | 27.0    | 10.1         |
| G26EPX   | 168.5      | 179.0   | 128.0   | 17.5    | 28.2    | 10.8         |
| G42EP    | 197.5      | 165.7   | 170.6   | 18.8    | 22.0    | 14.9         |
| G42EPX   | 199.8      | 169.1   | 172.8   | 20.1    | 23.2    | 15.9         |
| G70EP    | 330.71     | 168.15  | 176.02  | 246.13  | 62.23   | 24.3         |
| G70EPX   | 330.71     | 168.15  | 176.02  | 246.13  | 62.23   | 25.4         |

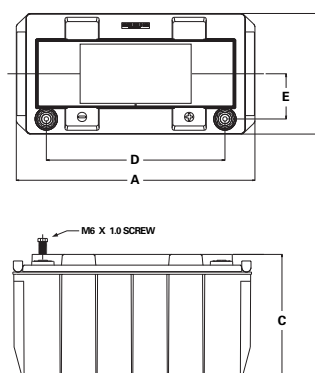
### G13EP - G16EPX



### G26EP - 42EPX



### G70EP & G70EPX

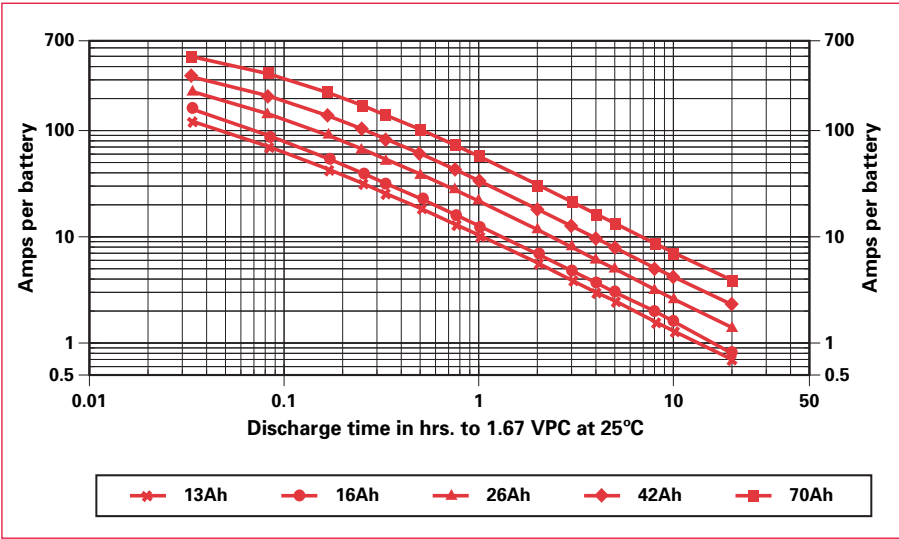


All shown without metal jacket

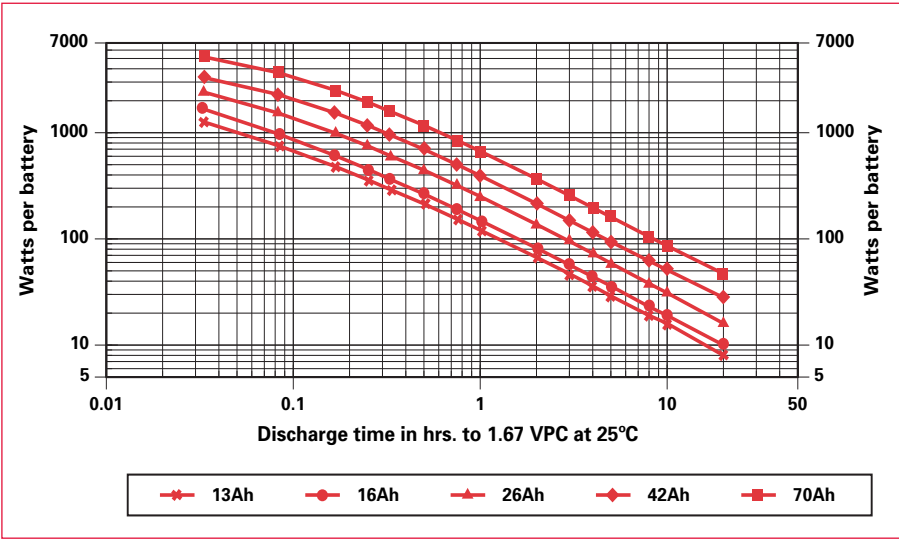
#### UL Recognised Component. Meets UL 1989

Caution: Batteries contain toxic materials (Pb and H<sub>2</sub>SO<sub>4</sub>) • Avoid short circuit • Do not charge in gas-tight container  
Sealed-lead rechargeable battery must be recycled or disposed of properly. Contact EnerSys Customer Service for details.

**GENESIS® constant current (CC) discharge**



**GENESIS® constant power (CP) discharge**







[www.enersys-emea.com](http://www.enersys-emea.com)

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