



SELECTION GUIDE

FIFTH EDITION





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EnerSys' Warrensburg plant covers 320,000 square feet and is situated on 33 acres

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.

EnerSys operates several of the first lead acid battery plants in the United States to receive the ISO 9001 certificates of registration, covering the company's product design, manufacturing, assembly, and customer service functions.

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' environmentally progressive Warrensburg, Missouri plant, home base of the GENESIS® product lines, covers 320,000 square feet on 33 acres and employs more than 400 people. EnerSys was the first battery company in the United States to receive ISO 14001 certification. ISO 14001 focuses on the environmental management system of the business and provides a systematic approach to resource conservation.

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.



Value-Added Services

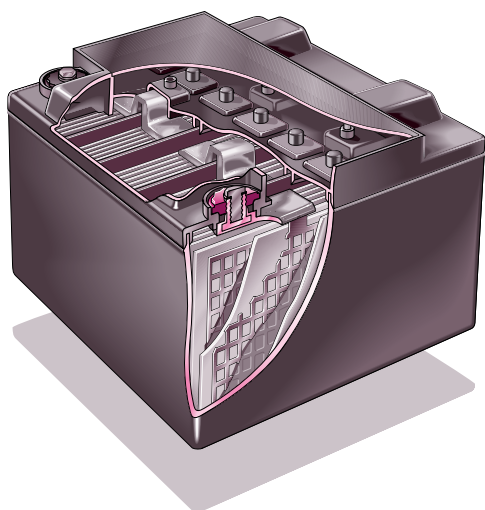
In addition to our manufacturing capability, EnerSys[®] is proud to provide its customers with the following services:

- customised manufacturing design
- battery recycling
- on-line Internet technical information
- charging support
- product testing
- on-site technical seminars
- battery samples
- application engineering
- technical documentation

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 EnerSys technology?

1. **Power density** - Per unit weight, the power provided by pure lead-tin products offers the greatest high-rate power density for your energy dollar. 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.

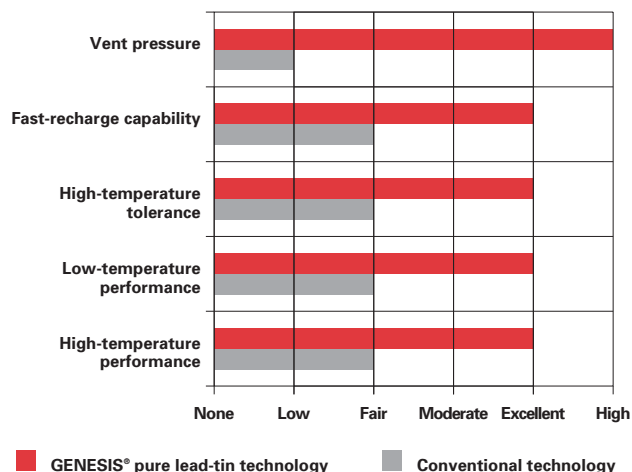
2. **Cycle life** - Compared to competitive lead products (offering up to 200 full cycles), pure lead-tin batteries provide 50% to 200% greater full cycle capability. GENESIS product will deliver up to 400 cycles (80% DOD, C/5). And, because GENESIS incorporates a high vent-pressure design, EnerSys' products experience no "dry out" failure mode from repeated recharges.
3. **Float life** - Conventional sealed-lead batteries vary greatly in specified standby life: from three to six years at 20°C, C/20. GENESIS, however, offer a ten-year design life at 25°C, C/5, to 80% of rated capacity. At 20°C, GENESIS Single Cells offer 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, similar to nickel cadmium, combined with our products' low internal resistance, means our batteries are able to discharge and recharge their power more quickly and 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. At high temperatures, when conventional

lead batteries experience internal moisture loss from venting and case side wall distention, the GENESIS, with its steel can (metal jacket) and high venting pressure, does not experience these life-robbing conditions. 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. This is 50% to 100% overall better performance for your energy dollar.

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 shipments from EnerSys® Warrensburg location, will be properly labeled in accordance with applicable regulations. **Packaging changes performed at other locations may require additional labeling, since in addition to the battery itself containing the required marking, the outer packaging of the battery must also contain the required marking: "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).

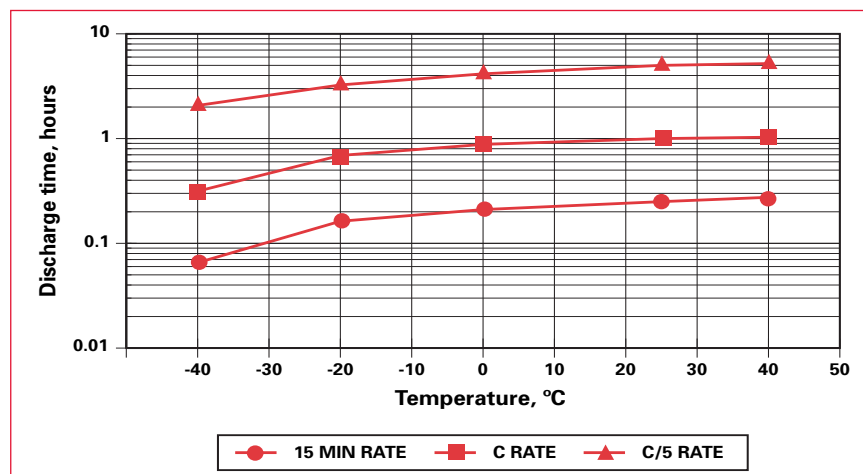
Because GENESIS are classified as "Nonspillable" and meet the conditions from § 173.159(d) they do not have an assigned UN number nor do they require additional DOT hazard labeling.

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".

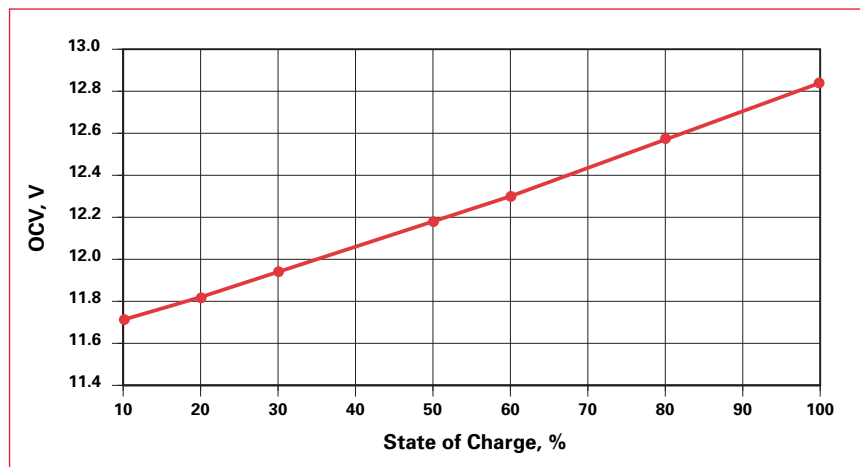
9. **Shelf life** - Pure lead-tin batteries have an extremely low self-discharge rate, thus providing extended storage capability while maintaining high state-of-charge levels for dependable operation.

GENESIS has a shelf life more than two times that of conventional lead batteries. To assure maximum reliability, EnerSys recommends that all stored cells/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.

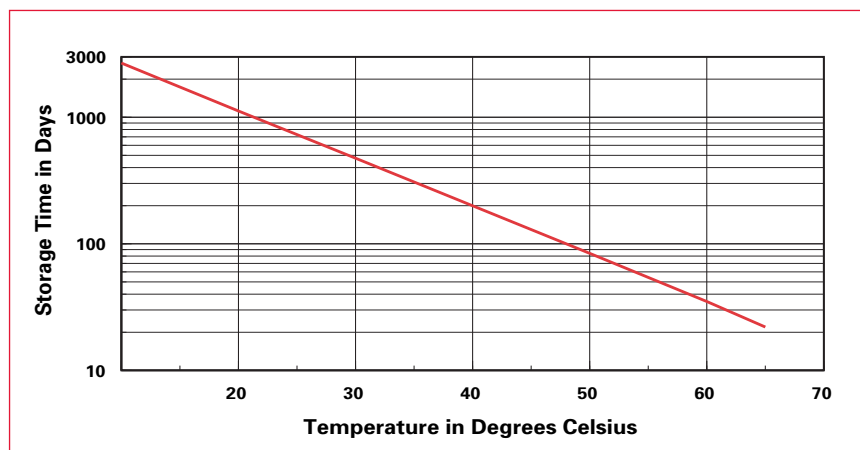
Capacity as a function of temperature for GENESIS® Batteries



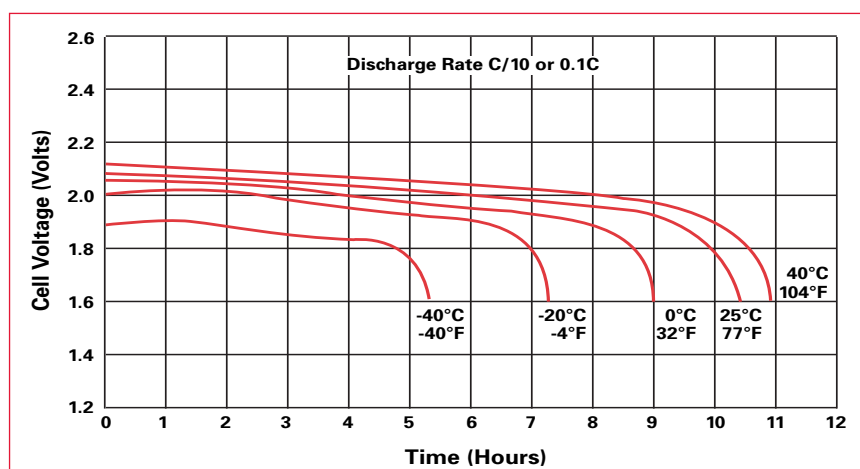
State of charge for GENESIS® batteries



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, 12 volts:
14.7 to 15.0 volts @ 25°C

Float Chargers, 12 volts:
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.

Most current waveforms are not pure DC nor are they pure sine waves. Therefore, *consult the EnerSys® Application Support Department* for assistance when evaluating the charger current waveforms for your specific application.

GENESIS® product family (All capacities at 10hr. rate 25°C to 1.67Vpc)

GENESIS® EP:

Products	Capacity	Part Number	Internal res. of fully charged cell mΩ @ 25°C	Nominal short circuit current for charged battery	DIMENSIONS								Brass Terminal (metric)
					Length in.	Length mm	Width in.	Width mm	Height in.	Height mm	Weight lb.	Weight kg	
G13EP	13Ah	0770-2007	8.5	1,400A	6.910	175.51	3.282	83.36	5.113	129.87	10.8	4.9	M6 w/ss hardware
G13EPX	13Ah	0770-2003	8.5	1,400A	6.998	177.75	3.368	85.55	5.165	131.19	12.0	5.4	M6 w/ss hardware
G16EP	16Ah	0769-2007	7.5	1,600A	7.150	181.61	3.005	76.33	6.605	167.77	13.5	6.1	M6 w/ss hardware
G16EPX	16Ah	0769-2003	7.5	1,600A	7.267	184.58	3.107	78.92	6.666	169.32	14.7	6.7	M6 w/ss hardware
G26EP	26Ah	0765-2001	5.0	2,400A	6.565	166.75	6.920	175.77	4.957	125.91	22.3	10.1	M6 w/ss hardware
G26EPX	26Ah	0765-2003	5.0	2,400A	6.636	168.55	7.049	179.04	5.040	128.02	23.8	10.8	M6 w/ss hardware
G42EP	42Ah	0766-2001	4.5	2,600A	7.775	197.49	6.525	165.74	6.715	170.56	32.9	14.9	M6 w/ss hardware
G42EPX	42Ah	0766-2003	4.5	2,600A	7.866	199.80	6.659	169.14	6.803	172.80	35.1	15.9	M6 w/ss hardware
G70EP	70Ah	0771-2001	3.5	3,500A	13.020	330.71	6.620	168.15	6.930	176.02	53.5	24.3	M6 w/ss hardware
G70EPX	70Ah	0771-2003	3.5	3,500A	13.020	330.71	6.620	168.15	6.930	176.02	56.0	25.4	M6 w/ss hardware

X denotes metal jacket design for extreme duty

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

Constant current discharge/watts per cell 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

Charging/Temperature/Life:

Products	CHARGING PER CELL		TEMPERATURE RANGE		LIFE EXPECTANCY	
	Cyclic	Float	Storage & discharge	Charge	C/5 Cycle life 100% DOD	Float life at 25°C (20°C)
G13EP, G16EP G26EP & G42EP	CV 14.7-15.0 CC*	CV 13.5-13.8 CC*	-40°C to +45°C	-40°C to +45°C	400	10 years (15 years)
G13EPX, G16EPX G26EPX & G42EPX	CV 14.7-15.0 CC*	CV 13.5-13.8 CC*	-40°C to +60°C	-40°C to +60°C	400	10 years (15 years)

Maximum recommended storage time before recharge - 24 months @ 25°C or 2.0Vpc, whichever is earlier

Atmospheric pressure range - Vacuum to 2 atmospheres

Terminal attachment torque for G13EP & G16EP - 50 in.-lbs (5.6 nm)

Terminal attachment torque for G26EP & G42EP - 60 in.-lbs (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											
	A		B		C		D		E		Weight	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lb.	kg
G13EP	6.910	175.51	3.282	83.36	5.113	129.87	5.56	141.2	0.81	20.6	10.8	4.9
G13EPX	6.998	177.75	3.368	85.55	5.165	131.19	5.56	141.2	0.81	20.6	12.0	5.4
G16EP	7.150	181.61	3.005	76.33	6.605	167.77	5.74	145.8	0.67	16.9	13.5	6.1
G16EPX	7.267	184.58	3.107	78.92	6.666	169.32	5.74	145.8	0.67	16.9	14.7	6.7
G26EP	6.565	166.75	6.920	175.77	4.957	125.91	0.64	16.3	1.06	27.0	22.3	10.1
G26EPX	6.636	168.55	7.049	179.04	5.040	128.02	0.69	17.5	1.11	28.2	23.8	10.8
G42EP	7.775	197.49	6.525	165.74	6.715	170.56	0.74	18.8	0.87	22.0	32.9	14.9
G42EPX	7.866	199.80	6.659	169.14	6.803	172.80	0.79	20.1	0.91	23.2	35.1	15.9

UL Recognised Component. Meets UL 1989

Caution: Batteries contain toxic materials (Pb and H₂SO₄) • 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® 70EP 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
G70EP (70Ah)	342.4	228.5	173.4	102.5	57.4	40.6	13.4	8.7	7.1	3.9

Constant power discharge/watts per battery 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
G70EP (70Ah)	3680	2519	1940	1173	670	486	161	105	86	47

Charging/Temperature/Life:

Products	CHARGING PER CELL		TEMPERATURE RANGE		LIFE EXPECTANCY	
	Cyclic	Float	Storage & discharge	Charge	C/5 Cycle life 100% DOD	Float life at 25°C (20°C)
G70EP	CV 14.7-15.0 CC*	CV 13.5-13.8 CC*	-40°C to +45°C	-40°C to +45°C	400	10 years (15 years)
G70EPX	CV 14.7-15.0 CC*	CV 13.5-13.8 CC*	-40°C to +60°C	-40°C to +60°C	400	10 years (15 years)

Maximum recommended storage time before recharge - 24 months @ 25°C or 2.0Vpc, whichever is earlier

Atmospheric pressure range - Vacuum to 2 atmospheres

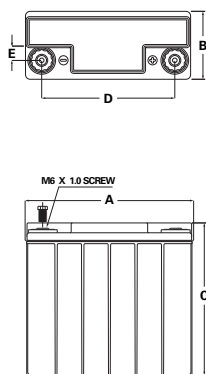
Terminal attachment torque for G70EP - 60 in.-lbs (6.8 nm)

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

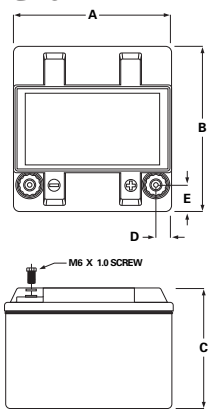
GENESIS® 70EP mechanical specifications (A, B & C - Maximum)

Products	DIMENSIONS										Weight lb. kg	
	in.	A mm	in.	B mm	in.	C mm	in.	D mm	in.	E mm		
G70EP	13.020	330.71	6.620	168.15	6.930	176.02	9.69	246.13	2.45	62.23	53.5	24.3
G70EPX	13.020	330.71	6.620	168.15	6.930	176.02	9.69	246.13	2.45	62.23	56.0	25.4

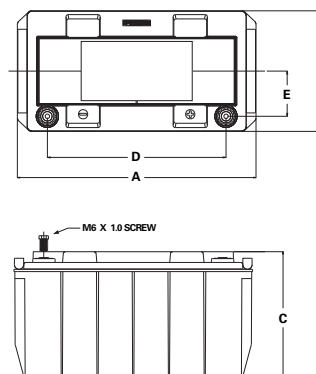
G13EP - G16EPX



G26EP - 42EPX



G70EP & G70EPX



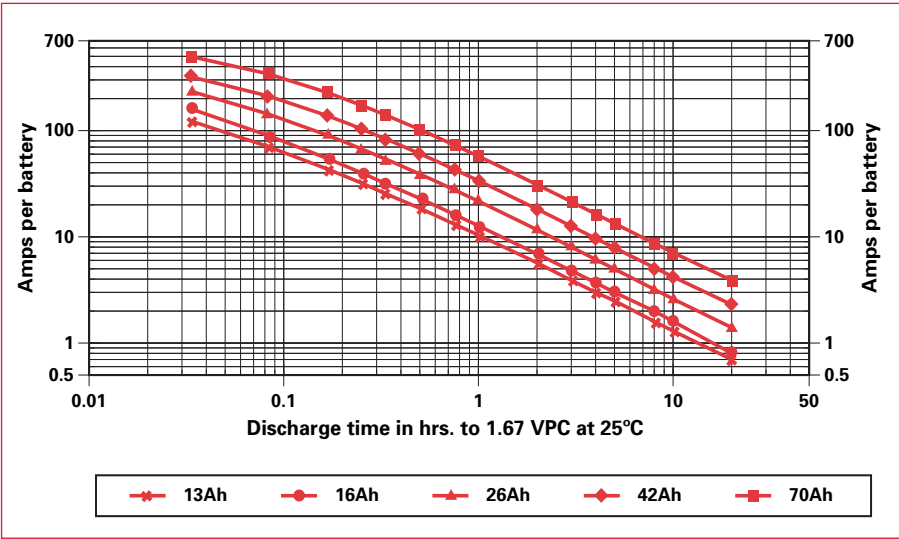
All shown without metal jacket

UL Recognised Component. Meets UL 1989

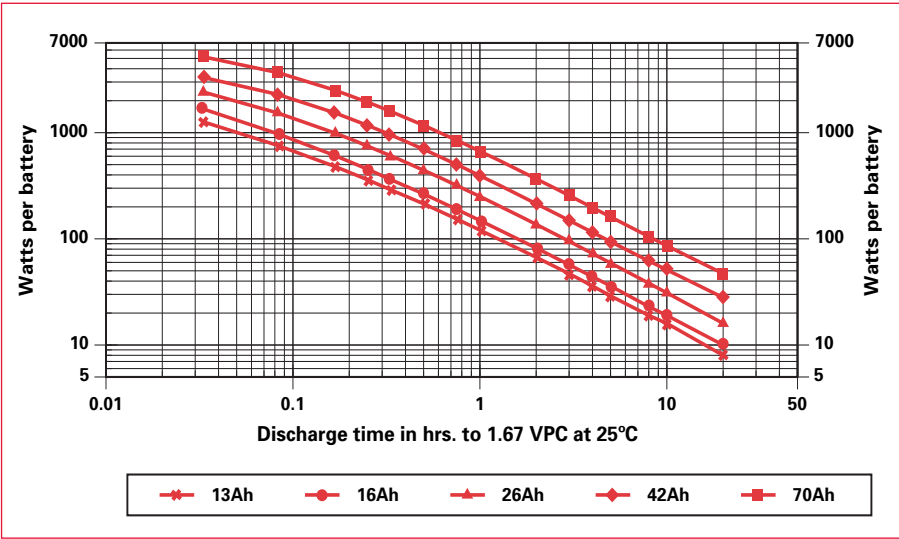
Caution: Batteries contain toxic materials (Pb and H₂SO₄) • Avoid short circuit • Do not charge in gas-tight container

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



ENERSYS[®] STANDARD PRODUCT LIST

GENESIS[®] EP Batteries

PART NUMBER	DESCRIPTION	VOLTAGE	10 Hr RATE	PERFORMANCE SPECIFICATIONS	MECHANICAL SPECIFICATIONS
0770-2007	G13EP (13Ah)	12V	13Ah	Page 8	Page 8
0770-2003	G13EPX (13Ah)	12V	13Ah	Page 8	Page 8
0769-2007	G16EP (16Ah)	12V	16Ah	Page 8	Page 8
0769-2003	G16EPX (16Ah)	12V	16Ah	Page 8	Page 8
0765-2001	G26EP (26Ah)	12V	26Ah	Page 8	Page 8
0765-2003	G26EPX (26Ah)	12V	26Ah	Page 8	Page 8
0766-2001	G42EP (42Ah)	12V	42Ah	Page 8	Page 8
0766-2003	G42EPX (42Ah)	12V	42Ah	Page 8	Page 8
0771-2001	G70EP (70Ah)	12V	70Ah	Page 9	Page 9
0771-2003	G70EPX (70Ah)	12V	70Ah	Page 9	Page 9



www.enersys-emea.com

EnerSys
P.O. Box 14145
Reading, PA 19612-4145
USA
Tel: +1-610-208-1991
+1-800-538-3627
Fax: +1-610-372-8613

EnerSys Europe
Zurich, Switzerland

EnerSys Asia
Guangdong, China
Tel: +86-755-2689 3639

EnerSys Ltd.
Rake Lane,
Clifton Junction,
Swinton, Manchester
M27 8LR, UK
Tel: +44 (0)161 794 4611
Fax: +44 (0)161 727 3809

Contact:

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