



RENEWABLE ENERGY & PARTIAL STATE OF CHARGE SOLUTIONS



DESIGNED FOR USE IN SOLAR,
RENEWABLE, WIND AND HYBRID
ENERGY SYSTEMS AND SOLUTIONS

POWER YOU CAN DEPEND ON

C&D Technologies delivers world-class power solutions for mission-critical industrial applications around the world. As a trusted power solutions provider for more than 100 years, C&D is committed to providing high quality, reliable and cost-effective products and services.

C&D Technologies has been producing batteries used in deep cycle applications for more than 20 years. As industry requirements change, C&D developed products for emerging Renewable Energy that required Partial State of Charge (PSoC). The AES Series of sealed VRLA AGM batteries feature advanced DCS technology and C&D Nano-Carbon™ technology for extensive cycle life. The AES series is built around a space efficient and cost effective case that allows for scalable installations.

Since uptime is essential to the renewable energy market, incorporating C&D's AES Series into a system ensures enhanced customer satisfaction and retention while delivering a proven cost-effective solution. **All day, every day.**

APPLICATIONS

- ◆ Remote/Hybrid Sites
- ◆ Grid Scale Energy Storage
- ◆ Communications
- ◆ Cycling Applications
- ◆ Off-Grid/Renewable

PROTECT YOUR POWER WITH OUR EFFECTIVE ANTI-THEFT DEVICE

Our simple, yet effective, anti-theft solution is designed to provide added security to any power grid, giving you the confidence and peace-of-mind in knowing your batteries are secured wherever they're stored.

BENEFITS:

- ◆ Strength in design
- ◆ Hardened stainless steel covers
- ◆ Stainless steel shear bolts intentionally break off during installation
- ◆ Added security for individual batteries through cover bar lengths and assembly
- ◆ Kit availability for AES Series batteries

COMPONENTS PER CONNECTION:

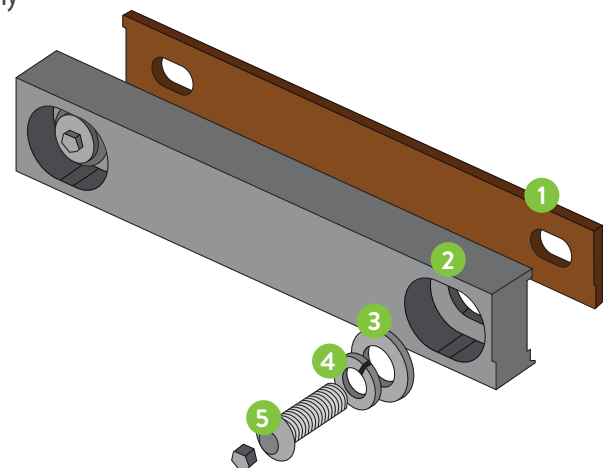
Item 1: Copper connector

Item 2: Hardened stainless steel connector cover

Item 3: ¼" flat-&-lock washer

Item 4: ¼"-20×¾" shear bolt button head screws – A2 stainless steel

Item 5: Disposed shear bolt stud – breaks off at assembly



ADVANCED ENERGY STORAGE

AES AGM batteries with C&D Nano-Carbon™ technology offer a longer service life in demanding deep-cycle applications (see application charts on page 5). They are designed to meet the demanding needs of grid-tied and off-grid energy applications requiring back-up power. These versatile maintenance-free batteries can be used in upright, side or end mounted orientations—no watering required.

- ◆ C&D Nano-Carbon™ technology enhanced active material to maximize cycle performance and PSoC operation
- ◆ Terminal versatility – ease of ohmic readings with C&D Ohmic Ring®
(Available on front terminal batteries: AES12-2170F and AES 12-2870F)
- ◆ Threaded copper alloy inserts for reduced maintenance and increased safety
- ◆ High-strength, leak-free polymer container allows for non-restricted shipping:
Water: non-hazardous per IMDG Amendment 27 Surface:
non-hazardous per DOT-CFR title 49, 171-189 Air: IATA/ICAO, provision A67
- ◆ 100% helium leak tested and dielectric tested to ensure seal integrity
- ◆ Design uses UL certified vents
- ◆ Non-Hazardous for Transportation
- ◆ Extended service life in elevated temperature applications
- ◆ UL94-V0 Compliant Case and Cover



STRONG DESIGN

In any application where the battery may face extreme temperature, shock, or vibration conditions, a rugged case is key to maintaining battery performance over time. All AES batteries are encased in a strong propylene case that protects all the battery's components and ensures that the battery will work day after day in the most demanding environments.

AES 7.5-1600



AES 8.0-1600



AES 12-2170F



AES 12-2870F



WHAT IS C&D NANO-CARBON™ TECHNOLOGY?

Traditional lead calcium batteries suffer pre-mature failure in cycling applications due to deterioration of the active material on the plates. C&D's Nano-Carbon technology is the solution. By enhancing the negative active material with C&D Nano-Carbon™ technology, the AES series is able to provide a long service life in cycling applications.

HIGH SURFACE AREA CARBON

- ◆ Specially formulated carbon additive for improving the Negative Active Material (NAM)
- ◆ Increases conductivity and adds additional capacitance to the negative electrode
- ◆ Improves cell to cell consistency for balance in larger systems

NANO-SCALE ADDITIVES

- ◆ Provides additional surface area needed to maintain discharge reactions
- ◆ Maintains the NAM in deep cycle applications
- ◆ Improves charge efficiency and allows Partial state of charge (PSoC) operation
- ◆ Improves deep discharge recovery



HIGH TEMPERATURE CARBON ADDITIVES

- ◆ Preserves more carbon material in the plate
- ◆ High temperature resistance for cycle applications in hot environments and heavy cycle applications that keep the battery operating at higher temperatures

ACHIEVING LONGER LIFE

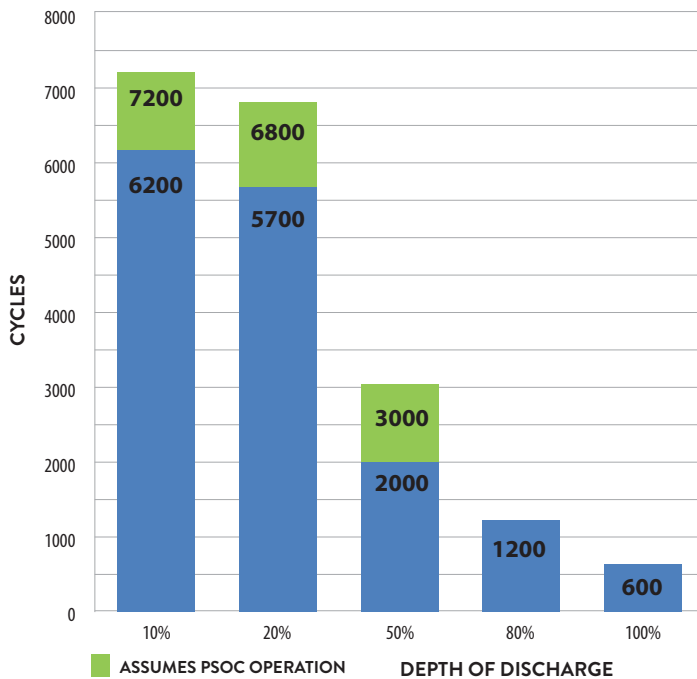
The key to the long service life of our AES batteries is our robust proprietary technologies. C&D Nano-Carbon™ technology formulation enhances life by improving charging efficiency while supporting cyclic PSoC operation. C&D's DCS technology features advanced plate technology for recharge efficiency and rugged cases are proven in real world environments. Quality manufacturing processes along with 100+ years of battery design helps provide AES batteries will last for years in your application.

AES BATTERY SPECIFICATIONS

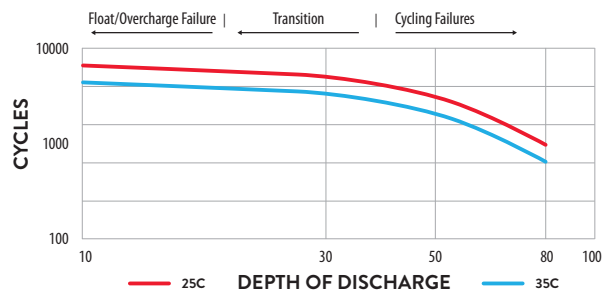
MODEL NAME	VOLTAGE	CAPACITY AMP-HOURS (Ah) @ 77°F (25°C)	CAPACITY AMP-HOURS (Ah) @ 77°F (25°C)	MAX DISCHARGE	INTERNAL RESISTANCE	MAX SHORT CIRCUIT CURRENT (PER IEC 60986)	DIMENSIONS INCHES (mm)			WEIGHT LBS. (kg)
		20-Hr RATE	100-Hr RATE				LENGTH	WIDTH	HEIGHT	
ADVANCED ENERGY STORAGE										
AES 7.5-1600	7.5 VOLT	168	182	800A	2.60	3270	10.4 (263)	7.1 (180)	11.3 (286)	82 lbs (37 kg)
AES 8.0-1600	8.0 VOLT	168	182	800A	2.60	3270	10.4 (263)	7.1 (180)	11.3 (286)	82 lbs (37 kg)
AES 12-2170F	12 VOLT	192	209	800A	4.60	2729	22.0 (559)	5.0 (126)	12.7 (322)	134 lbs (61 kg)
AES 12-2870F	12 VOLT	224	242	800A	3.60	3477	22.0 (559)	6.1 (154)	12.7 (322)	161 lbs (73 kg)

SPECIFICATIONS			
OPERATING TEMPERATURE	Discharge: -40°C (-40°F) to +60°C (160°F) Charge: -23°C (-10°F) to +60°C (140°F)		
MAXIMUM CHARGING CURRENT LIMIT	0.6 C ₁₀		
FLOAT CHARGING VOLTAGE	12.27V per Cell at 25°C (77°F)		
SELF DISCHARGE	Battery can be stored up to 6 months at 25°C (77°F) before freshening charge is required. Batteries stored at temperatures greater than 25°C (77°F) will require recharge sooner than batteries stored at lower temperatures. See C&D operational anual 41-7272, Self-Discharge andn Inventory Control for details.		
EQUALIZE CHARGING & CYCLE SERVICE VOLTAGE	2.4V per Cell at 25°C (77°F)		
TERMINAL	AES 7.5-1600 & AES 8.0-1600 Threaded copper alloy insert terminal to accept: 1/4-20 UNC bolt	AES 12-2170F Threaded copper alloy insert terminal to accept: M8 bolt	AES 12-2870F Threaded copper alloy insert terminal to accept: M8 bolt
TERMINAL HARDWARE TORQUE	AES 7.5-1600 & AES 8.0-1600 12.4N-M (110in. -lbs)	AES 12-2170F 18N-M (160in. -lbs)	AES 12-2870F 18N-M (160in. -lbs)

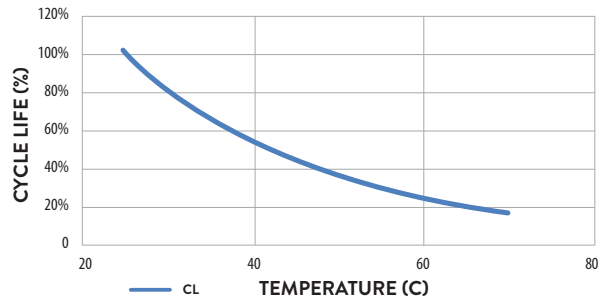
DEPTH OF DISCHARGE VS. CYCLES¹



APPLICATION AND TYPICAL FAILURE MODE¹

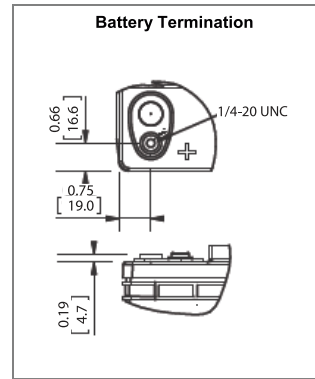
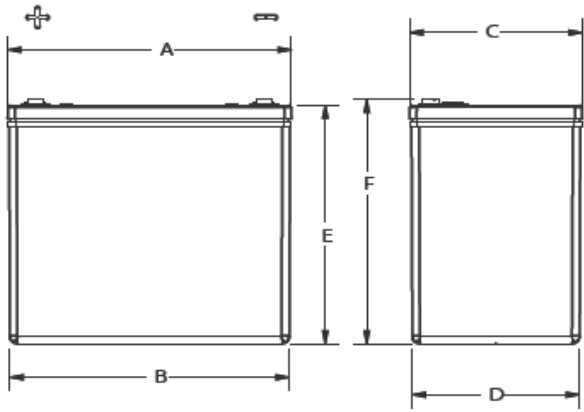


CYCLE LIFE VS. TEMPERATURE¹



¹ - Data taken from AES-2170F and representative of AES battery family

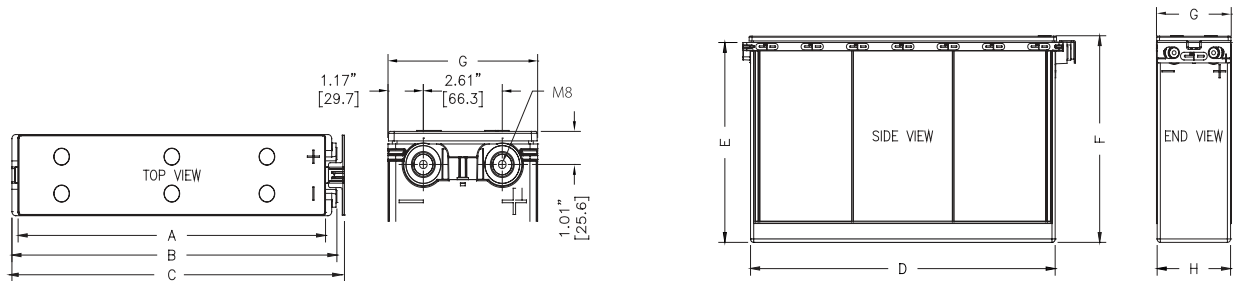
DIMENSIONS & WEIGHTS



AES 7.5-1600 & AES 8.0-1600					
A	B	C	D	E	F
10.4 (263)	9.4 (239)	7.1 (180)	6.8 (172)	11.2 (283)	11.3 (286)

*All dimensions in inches and (millimeters). All dimensions are for reference only. Contact a C&D Representative for complete dimensions information.

*Note: Batteries to be mounted with 0.5 IN (12.5MM) spacing minimum and free air ventilation.



AES 12-2170F & AES 12-2870F								
MODEL	A	B	C	D	E	F	G	H
AES 12-2170F	20.4 (518)	21.6 (547)	22 (559)	20 (512)	12.2 (311)	12.7 (322)	5 (126)	4.9 (123)
AES 12-2870F	20.4 (518)	21.6 (547)	22 (557)	20 (512)	12.2 (311)	12.7 (322)	6.1 (155)	6 (153)

*All dimensions in inches and (millimeters). All dimensions are for reference only. Contact a C&D Representative for complete dimensions information.

*Note: Batteries to be mounted with 0.5 IN (12.5MM) spacing minimum and free air ventilation.

PERFORMANCE RATINGS

CONSTANT CURRENT DISCHARGE RATINGS - AMPERES @ 77°F (25°C)

MODEL	VOLTAGE	Operating Time (hr.) to 1.8 Volts per Cell									
		5	8	10	12	20	24	48	72	100	120
AES 7.5-1600	8	28.3	18.9	15.5	13.1	8.3	7.1	3.6	2.5	1.8	1.5
AES 8.0-1600	8	28.3	18.9	15.5	13.1	8.3	7.1	3.6	2.5	1.8	1.5
AES 12-2170F	12	31.3	20.9	17.2	14.7	9.5	8.1	4.2	2.8	2.1	1.7
AES 12-2870F	12	35.4	23.8	20.0	17.0	11.0	9.4	4.8	3.3	2.4	2.0

CONSTANT CURRENT DISCHARGE RATINGS - AMPERES @ 86°F (30°C)

MODEL	VOLTAGE	Operating Time (hr.) to 1.8 Volts per Cell									
		5	8	10	12	20	24	48	72	100	120
AES 7.5-1600	8	29.6	19.8	16.2	13.7	8.7	7.4	3.8	2.6	1.88	1.6
AES 8.0-1600	8	29.6	19.8	16.2	13.7	8.7	7.4	3.8	2.6	1.88	1.6
AES 12-2170F	12	32.7	21.9	18.0	15.4	9.9	8.5	4.4	2.9	2.14	1.8
AES 12-2870F	12	37.0	24.9	20.9	17.8	11.5	9.8	5.0	3.5	2.49	2.1

CONSTANT POWER DISCHARGE RATINGS - WATTS PER CELL @ 77°F (25°C)

MODEL	VOLTAGE	Operating Time (hr.) to 1.8 Volts per Cell									
		1	3	4	5	8	10	12	20	24	100
AES 7.5-1600	8	192.5	79.9	63.2	52.7	36.0	30.0	25.7	16.3	13.9	3.5
AES 8.0-1600	8	192.5	79.9	63.2	52.7	36.0	30.0	25.7	16.3	13.9	3.5
AES 12-2170F	12	206.0	89.4	70.6	59.2	40.8	34.1	29.1	18.6	15.9	4.0
AES 12-2870F	12	230.6	100.6	80.6	67.7	46.9	39.1	33.5	21.7	18.5	4.6

CONSTANT POWER DISCHARGE RATINGS - WATTS PER CELL @ 86°F (30°C)

MODEL	VOLTAGE	Operating Time (hr.) to 1.8 Volts per Cell									
		1	3	4	5	8	10	12	20	24	100
AES 7.5-1600	8	201.4	83.6	66.2	55.2	37.6	31.4	26.9	17.0	14.5	3.6
AES 8.0-1600	8	201.4	83.6	66.2	55.2	37.6	31.4	26.9	17.0	14.5	3.6
AES 12-2170F	12	215.5	93.5	73.8	61.9	42.7	35.6	30.4	19.5	16.6	4.2
AES 12-2870F	12	241.2	105.2	84.3	70.8	49.0	40.8	35.1	22.6	19.3	4.8



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