# TECHNICAL DATA SHEET

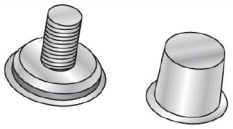
## CR350-HD

### INDUSTRIAL DEEP CYCLE BATTERY

We offer a complete lineup of high-performance and low-maintenance industrial deep cycle batteries produced in standard Battery Council International group profiles for voltage, electrical capacity and physical dimension. Our innovative and proven deep cycle product design makes it the battery of choice for many tough commercial battery applications, including commercial floor care and aerial access equipment, electric vehicles, personnel carriers, material handling systems and renewable energy systems.

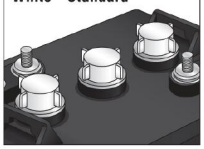
### AVAILABLE TERMINAL STYLES:

Standard

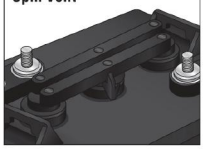


### VENT CAP OPTIONS:

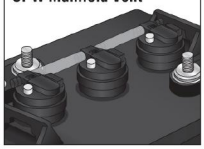
White – Standard



Spin Vent



SPW Manifold Vent



### PHYSICAL SPECIFICATIONS

| BCI Group Size | Model Description | Nominal Voltage | Length | | Width | | Container Height | | Terminal Height | | Weight | | Cover & Container Material | Case to Cover Seal Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | in | mm | in | mm | in | mm | in | mm | lbs | kgs | | |
| 902 | CR350-HD | 6 | 12.19 | 310 | 7.19 | 183 | 13.27 | 337 | 14.13 | 359 | 101 | 45.8 | Polypropylene Plastic | Heat Seal |

### ELECTRICAL SPECIFICATIONS

| Ampere Hour Capacity (Ah) | | | | | | | Discharge Capacity Minutes | | | | | KWH (kWh) | Internal Resistance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 Hr | 72 Hr | 48 Hr | 20 Hr | 10 Hr | 5 Hr | 2 Hr | 100A | 75A | 50A | 25A | 10A | 100 Hr | 80°F / 27°C |
| 400 | 380 | 365 | 350 | 297 | 290 | 221 | 136 | 210 | 314 | 710 | 2086 | 2.400 | 8.0mΩ |

### CHARGING INSTRUCTIONS

We specifie the following standard battery charge profile for the CR350-HD deep cycle battery when used in an electric vehicle service:

**Phase 1: Constant Current (I1)** I1 = highest amperage available < 75 amps

**Phase 1: Constant Current (I1)**I1 = minimum amperage available > 35 amps

Normal transition to Phase 2 at 2.37 Volts Per Cell.

Safety transition to END OF CHARGE of dV / dt <0V / 1 hr, dt = 1 hr. (NEGATIVE SLOPE).

Timeout for Phase 1 = 10 hours.

**Phase 2: Constant Voltage (U2)**U2 = 2.37 VPC

Normal Transition to Phase 3 at I2 = 10.0 amps or approximate. Safety transition to END OF CHARGE of l dI/dt l < 0.4 amp / 1 hr, dt = 1 hr.

**Phase 3: Constant Current (I3)** I3 = 10.0 amps or approximate. Normal transition to END OF CHARGE at 115 - 118% of AH returned.

Timeout for charging phases 1 - 3 at 16 hours.

Temperature compensation coefficient = +/- 3 mV / °C.

Recommended Equalization Charge: Every seven (7) days. 4 additional hours at normal finish rate of 10.0 amps for 4 hours.

Safety transition to END OF CHARGE at maximum voltage of 2.7 VPC.

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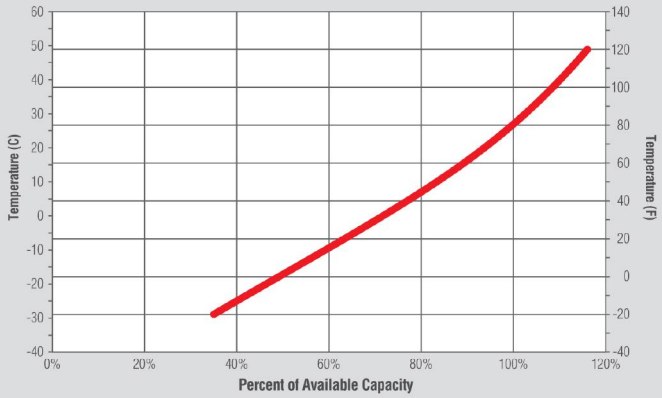
## CR350-HD

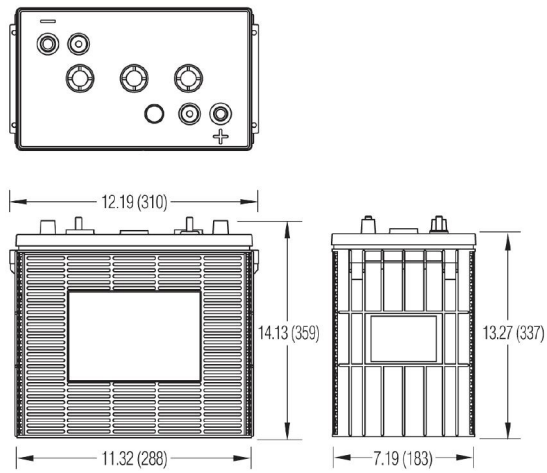
### APPLICATION RECOMMENDATIONS

| Specific Gravity | Operating Temperature Range | Self Discharge | Terminal Torque Specifications |
|---|---|---|---|
| Fully charged battery specific gravity (100% state-of-charge) is 1.275<br><br>Fully discharged battery specific gravity (100% depth-of-discharge) is 1.125 | -40°F to 120°F (-40°C to 49°C). Flooded lead acid battery capacities are temperature sensitive: refer to the temperature / capacity projection chart below to identify available capacity at the application operating temperature. **Application Note:** Maintain a state of charge greater than 60 percent when operating flooded lead acid batteries at temperatures below 32°F (0°C). | Fully charged batteries that are stored at a temperature of 80°F (27°C) will self-discharge at a rate of 3.5% per week. | SAE / Automotive Terminal Style:<br>50 to 70 in-lbs / 6 to 8 Nm<br><br>Stainless Threaded Terminal (Types C, S, Z):<br>100 to 120 in-lbs / 11 to 14 Nm |

Application Note: Lead acid batteries contain corrosive battery electrolyte and generate highly flammable hydrogen gas. When working near batteries wear protective clothing, gloves, and safety glasses when handling batteries and electrolyte and always work in a well-ventilated area. Do not over-torque terminals. Over-torque can result in terminal damage, breakage, terminal meltdown or fire. This flooded lead acid deep cycle batteries require periodic preventative maintenance and effective charging service to ensure dependable service life.

### AVAILABLE CAPACITY AT APPLICATION OPERATING TEMPERATURE

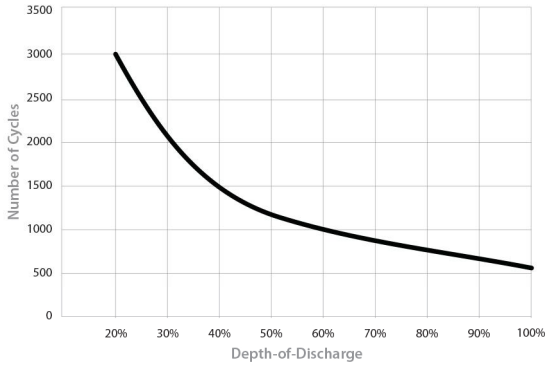



### TYPICAL BATTERY CYCLE LIFE / DEPTH OF DISCHARGE

| Battery Model | 100% DOD Cycles | End-Cycle Voltage | 50% DOD Cycles | End-Cycle Voltage | 40% DOD Cycles | End-Cycle Voltage | 20% DOD Cycles | End-Cycle Voltage |
|---|---|---|---|---|---|---|---|---|
| CR350-HD | 500 | 1.75 VPC | 1200 | 1.94 VPC | 1500 | 1.97 VPC | 3000 | 2.05 VPC |

The battery life references presented above are estimations based upon stationary life cycle testing conducted at our testing Center. The data references are nominal and should not be construed as maximum or minimum values for specifications or for final design. Data for this product type may vary from that shown herein, and the manufacturer makes no warranties – expressed or implied – based upon the data shown above.




### Effect of Battery Temperature on Battery Life

Lead acid batteries are electrochemical storage devices that store and release chemical energy upon demand in the form of electricity. By virtue of their design lead acid batteries are highly reactive to temperature – with the rate of chemical reactions that occur within the battery being affected by the operating temperature where the battery is used. Higher operating temperatures will result in faster chemical reactions within the battery – delivering improved discharge performance; conversely, cooler operating temperatures will result in slower internal chemistry. However, higher operating temperatures also result in shortened battery life as the increased rate of chemical reactions will accelerate the rate of deterioration of internal components. Typical battery life is based upon a baseline operating temperature of 80°F / 27°C. Temperature increases of 15°F / 10°C over the baseline will cause the battery's rate of internal chemical reactions to double – something that will reduce battery life due to the accelerated deterioration of internal components. Please contact the manufacturer to discuss any minimal requirements for battery life when operating batteries in temperatures greater than 80°F / 27°C.


Your local dealer :

Batteriexpressen

**Batteriexpressen AB**
**Kranvägen 2, 194 54 Upplands Väsby**
**www.batteriexpressen.se tel:(+46) 08 35 29 50**