

MODEL **IND33-2V**  
 NOMINAL CAPACITY **1849AH @ C<sub>20</sub>**  
 MATERIAL **Polypropylene** (internal cell container) **Polyethylene** (outer container)  
 DIMENSIONS **Inches (mm)**  
 BATTERY **Deep-Cycle Flooded/Advanced Lead Acid Battery**  
 COLOR **Maroon**  
 WATERING **Single-Point Watering Kit (Optional)**  
 PRODUCT HIGHLIGHTS **Smart Carbon™ for Improved Performance**  
**17 Years Battery Life Based on IEC 61427**



**2V**

### PRODUCT + PHYSICAL SPECIFICATIONS

BCI Group Size	Type	Terminal Type <sup>6</sup>	Dimensions <sup>c</sup> Inches (mm)			Weight Lbs. (kg)
			Length	Width	Height <sup>f</sup>	
N/A	IND33-2V	14	17.33 (440)	10.22 (260)	24.01 (610)	278 (125)

### ELECTRICAL SPECIFICATIONS

Cranking Performance		Capacity <sup>A</sup> Minutes		Capacity <sup>B</sup> Amp-Hours (AH)							Energy (kWh)	Internal Resistance (mΩ)	Short Circuit Current (amps)
C.C.A. <sup>D</sup> @ 0°F (-18°C)	C.A. <sup>E</sup> @ 32°F (0°C)	@ 25 Amps	@ 75 Amps	2-Hr	5-Hr	10-Hr	20-Hr	48-Hr	72-Hr	100-Hr	100-Hr		
—	—	—	—	—	1455	1682	1849	2170	2311	2405	4.81	—	—

### CHARGING INSTRUCTIONS

System Voltage	Charger Voltage Settings (at 77°F/25°C)						
	2V	6V	12V	24V	36V	48V	
Bulk Charge	2.47	7.41	14.82	29.64	44.46	59.28	
Float Charge	2.25	6.75	13.50	27.00	40.50	54.00	
Equalize Charge	2.70	8.10	16.20	32.40	48.60	64.80	

Do not install or charge batteries in a sealed or non-ventilated compartment. Constant under or overcharging will damage the battery and shorten its life as with any battery.

### CHARGING TEMPERATURE COMPENSATION

Add	Subtract
0.005 volt per cell for every 1°C below 25°C 0.0028 volt per cell for every 1°F below 77°F	0.005 volt per cell for every 1°C above 25°C 0.0028 volt per cell for every 1°F above 77°F

### OPERATIONAL DATA

Operating Temperature	Self Discharge
-4°F to 113°F (-20°C to +45°C). At temperatures below 32°F (0°C) maintain a state of charge greater than 60%.	5 – 15% per month depending on storage temperature conditions.

### STATE OF CHARGE MEASURE OF OPEN-CIRCUIT VOLTAGE


Percentage Charge	Specific Gravity	Cell	2 Volt
100	1.260	2.11	2.11
90	1.246	2.09	2.09
80	1.227	2.07	2.07
70	1.207	2.05	2.05
60	1.187	2.03	2.03
50	1.165	2.01	2.01
40	1.142	1.99	1.99
30	1.119	1.96	1.96
20	1.096	1.94	1.94
10	1.072	1.92	1.92





Designed in compliance with applicable BCI, DIN, BS and IEC standards.  
 Tested in compliance to BCI and IEC standards.



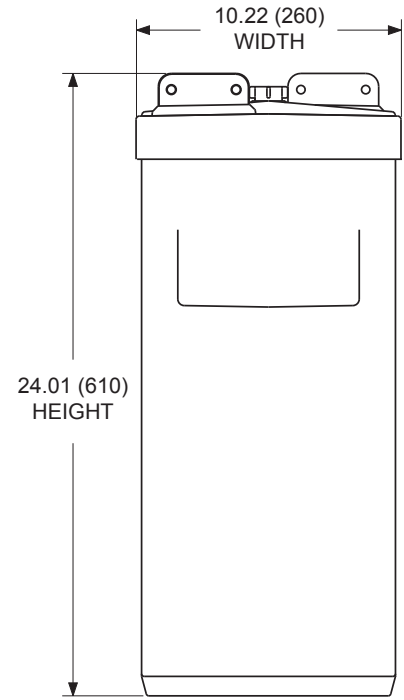
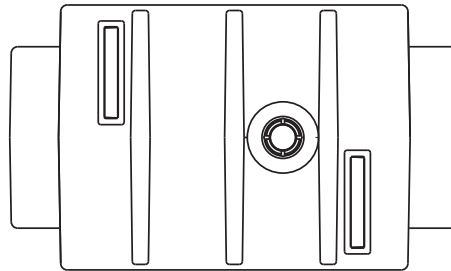
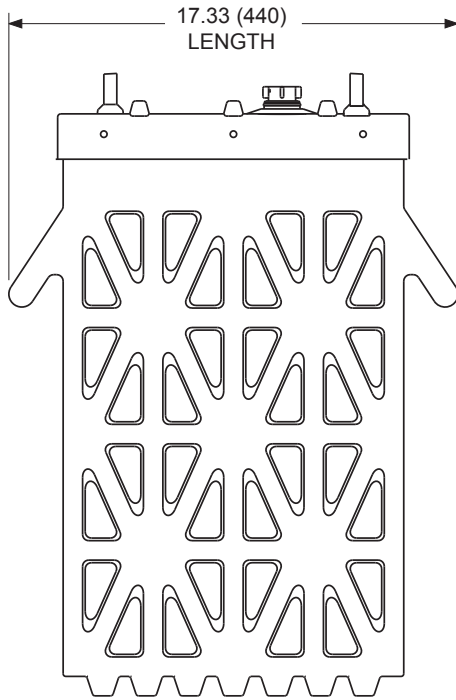
## TERMINAL CONFIGURATIONS <sup>6</sup>

14	IND	IND Terminal
		<p><b>Terminal Height Inches (mm)</b> 1.75 (44)</p> <p><b>Torque Values in-lb (Nm)</b> 95 – 105 (11 – 12)</p> <p><b>Bolt</b> 5/16"</p>

## VENT CAP OPTIONS

Bayonet	Flip Top
	

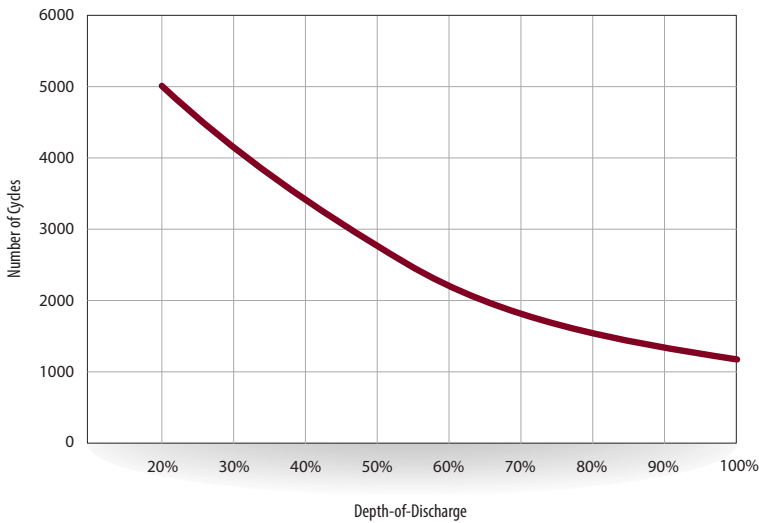
## BATTERY DIMENSIONS (shown with IND)



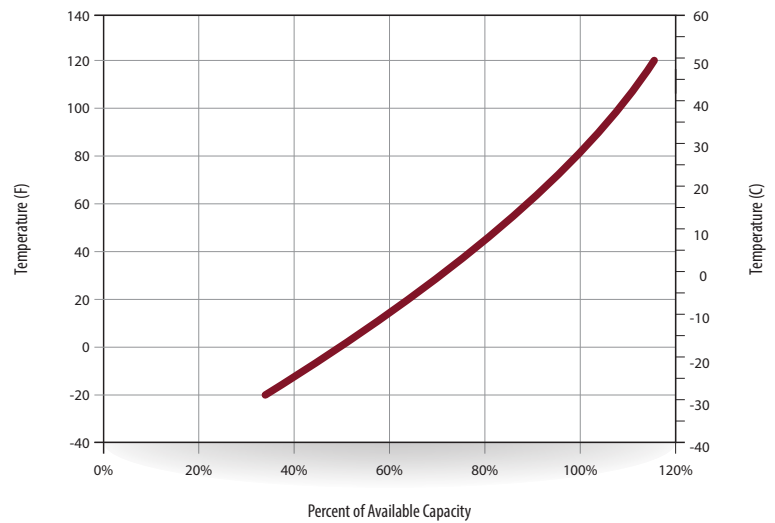
## CAPACITY AMP-HOURS (AH)

Cutoff Voltage	5-Hr	10-Hr	20-Hr	48-Hr	72-Hr	100-Hr	240-Hr
1.75 vpc	1455	1682	1849	2170	2311	2405	2411
1.80 vpc	1312	1581	1775	2114	2254	2343	2349
1.85 vpc	1189	1430	1630	1888	2057	2208	2213
1.90 vpc	887	1151	1365	1579	1748	1961	1964

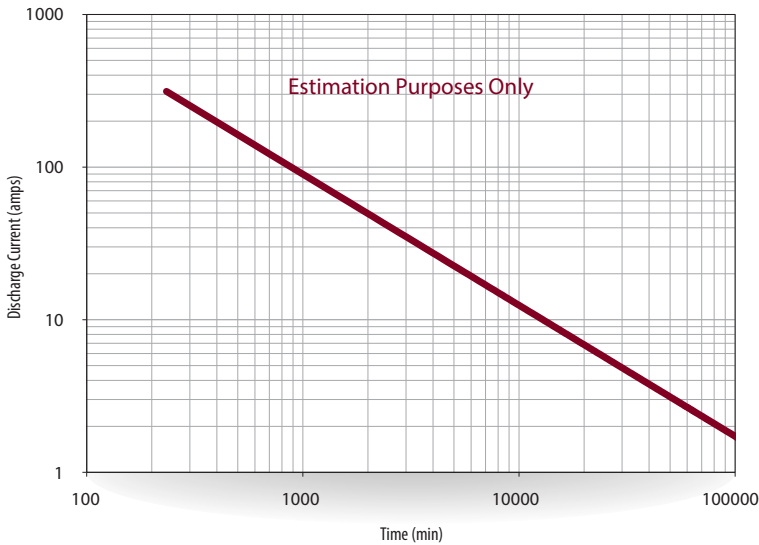
## TYPICAL CYCLE LIFE IN A STATIONARY APPLICATION



## PERCENT CAPACITY VS. TEMPERATURE



## TROJAN IND33-2V PERFORMANCE



## EXPECTED LIFE VS. TEMPERATURE

Chemical reactions internal to the battery are driven by voltage and temperature. The higher the battery temperature, the faster chemical reactions will occur. While higher temperatures can provide improved discharge performance the increased rate of chemical reactions will result in a corresponding loss of battery life. As a rule of thumb, for every 10°C increase in temperature the reaction rate doubles. Thus, a month of operation at 35°C is equivalent in battery life to two months at 25°C. Heat is an enemy of all lead acid batteries, FLA, AGM and gel alike and even small increases in temperature will have a major influence on battery life.

## SMART CARBON™

Deep-cycle batteries used in off-grid and unstable grid applications are heavily cycled at partial state of charge (PSOC). Operating at PSOC on a regular basis can quickly diminish the overall life of a battery, which results in frequent and costly battery replacements. To address the impact of PSOC on deep-cycle batteries in renewable energy (RE), inverter backup and telecom applications, Trojan Battery has now included Smart Carbon™ as a standard feature in its Industrial and Premium flooded battery lines.

- A. The number of minutes a battery can deliver when discharged at a constant rate at 80°F (27°C) and maintain a voltage above 1.75 V/cell. Capacities are based on peak performance.
- B. The amount of amp-hours (AH) a battery can deliver when discharged at a constant rate at 80°F (27°C) and maintain a voltage above 1.75 V/cell. Capacities are based on peak performance.
- C. Dimensions may vary depending on type of handle or terminal. Batteries should be mounted with 0.5 inches (12.7 mm) spacing minimum.

- D. C.C.A. (Cold Cranking Amps) - the discharge load in amperes which a new, fully charged battery can maintain for 30 seconds at 0°F (-18°C) at a voltage above 1.2 V/cell.
- E. C.A. (Cranking Amps) - the discharge load in amperes which a new, fully charged battery can maintain for 30 seconds at 32°F (0°C) at a voltage above 1.2 V/cell. This is sometimes referred to as marine cranking amps @ 32°F or M.C.A. @ 32°F.
- F. Height taken from bottom of the battery to the highest point on the battery. Heights may vary depending on type of terminal.
- G. Terminal images are representative only.



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