Discover®
Innovative Battery Solutions

DCR12-235

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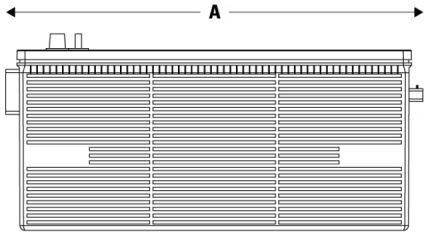
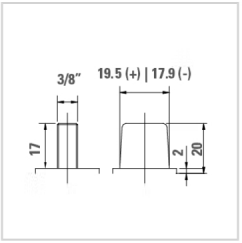
DRY CELL Commercial Rail/Transit

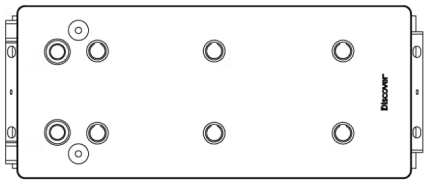
Discover® DRY CELL Rail Transit batteries outperform traditional AGM and Gel batteries and are a resilient battery solution for passenger rail and transit applications. The batteries exceed rigorous passenger transport safety tests and incorporate design features that adhere to frequent vibration, wide operating temperatures, high cranking and long duration cyclic current draws.

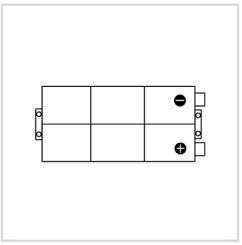
DRY CELL Rail Transit batteries are trusted by some of most reputable rail, bus and tram organizations in the world.





TERMINAL





LAYOUT

MECHANICAL SPECIFICATIONS

Industry Reference	BCI: 4DR	
Length A (in/mm)	20.6	524
Width B (in/mm)	8.9	225
Height C (in/mm)	8.7	222
Total Height D (in/mm)	9.5	242
Weight (lbs/kgs)	140.8	64
Terminal *	AT	
Technology	DRY CELL AGM, VRLA	

NOTE 1: Dimensions have a ±2 mm (0.08 in) tolerance. Weights may vary.
NOTE 2: Refer to terminal guide on website for torque values.

ELECTRICAL SPECIFICATIONS

Voltage (V)	12
Internal Resistance (mΩ)	3
Short Circuit (A) (20°C / 68°F)	4300
Self-Discharge (20°C / 68°F)	2-3% per month
Charge Temperature	Min: -10°C (14°F) | Max: 50°C (122°F)
Discharge Temperature	Min: -40°C (-40°F) | Max: 50°C (122°F)
Storage Temperature	Min: -20°C (-4°F) | Max: 60°C (140°F)

NOTE 3: Extra considerations must be given when designing systems for use at maximum temperatures.
NOTE 4: Internal Resistance is approximate.

PERFORMANCE SPECIFICATIONS

Amp Hours (AH)		
5 HR	10 HR	20 HR
220	235	255

Minutes of Discharge		Cranking Amps	
@25A	@75A	CA (0°C/32°F)	CCA (-18°C/0°F)
550	150	1440	1200

5 HR: 1.75VPC; 10 HR: 1.80VPC; 20 HR: 1.80VPC. All at 30°C/86°F

FEATURES

HYDRO POLYMER
- Organic capillary separators with hydro polymer electrolytes resist dry-out and prevent thermal runaway
- Maintains performance characteristics over operational life

ENHANCED ALLOYS
- Thick plates with graphite enhanced alloys deliver maximum runtime over operational life

CARBON BOOST
- Carbon additives to increase duty cycle performance, charge acceptance, and partial state of charge operation

AUTOMATED THROUGH-THE-PARTITION WELD
- Improved intercell weld consistency, and less lead waste than manual welding process (key industry models)
- Supports higher current loads and lowers internal resistance

POLYPROPYLENE CASE
- High heat resistance and durability (key industry models)
- High precision pressure relief valves reduce water loss and extend life
- Integrated flame arrestors prevent fire and explosion

BENEFITS

RESILIENCE
- Partial stage of charge operation superior to AGM
- Intense duty cycling superior to AGM / Gel
- Overcharge and over-discharge resilience superior to AGM
- Compatible with AGM / Gel semi-traction charge profile

EXTREME VIBRATION RESISTANCE
- Vibration resistance superior to AGM / Gel
- Shock tested (IEC 61373, DIN EN 61373, SAE J537)

EXTREME TEMPERATURES
- High temperature life superior to AGM
- Low temperature operation superior to FLA / AGM / Gel batteries

HL3 V0 FLAME RETARDANT CASE
- Fire and smoke protection tested (DIN EN 45545-2)
- Safe for use in passenger transport

RELIABLE AND SAFE
- Valve Regulated Lead-Acid, Dry Cell AGM
- Maintenance-free, nonspillable, no-gassing
- Spark and explosion tested (SAE J1495)

CERTIFIED QUALITY

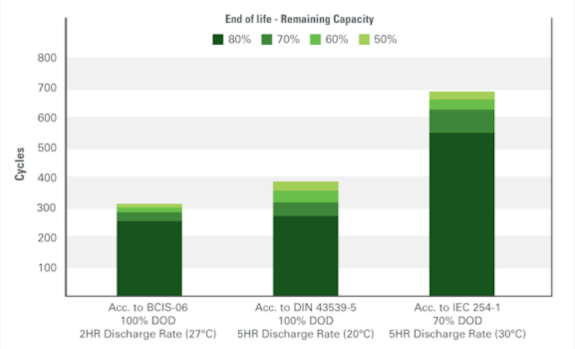
Discover® manufacturing facilities are fully certified to ISO 9001/14001 and OSHA 18001 standards.
Designed in accordance with and published in compliance with applicable standards, including:
- IEC 60254-1. Lead-Acid Traction
- DIN 43 539. VRLA
- SAE J537. Storage
- DIN EN 45545-2 (02/2016) - Fire Protection on Railway Vehicles and DIN EN ISO 5659-2 (03/2013)
- IEC 61373-2010, DIN EN 61373-2011. Long-Life Random Vibration, Shock, Functional Vibration
- UL, CE Health Safety Certified

SHIPPING CLASSIFICATION

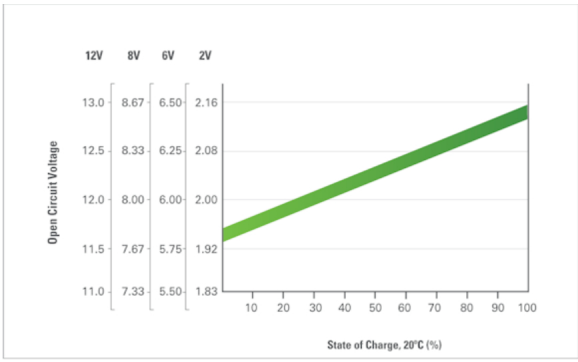
- Classified as a nonspillable battery
- Without restriction for transport by Sea (IMDG amendment 27)
- Without restriction for transport by Air (IATA/ICAO provision 67)
- Without restriction for transport by Ground (STB, DOT-CFR-HMR49)

Temperature Effects on Capacity

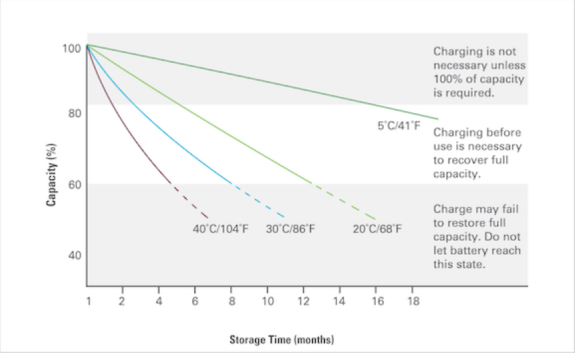
Test Standards and Cycle Life



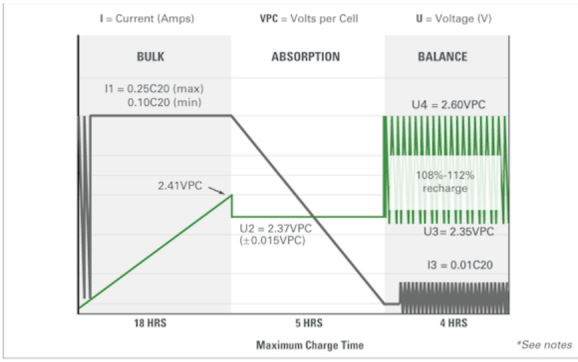
Open Circuit Voltage in Relation to SOC (20°C)



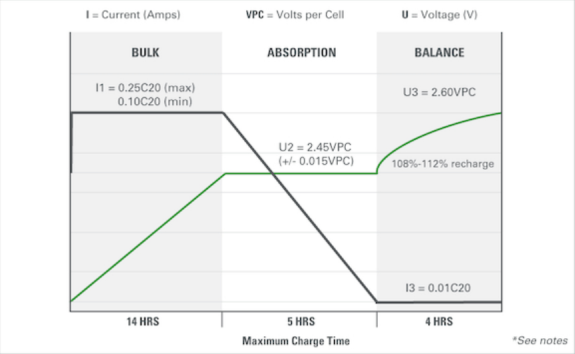
Self-Discharge Characteristics



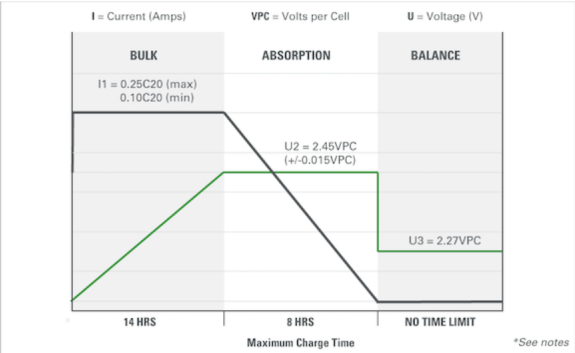
IUI Pulse Charge Profile



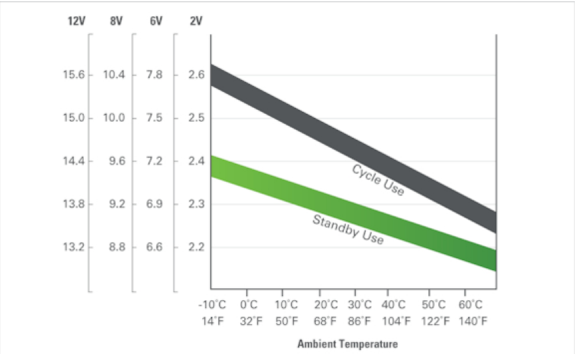
Constant Current (IUI) Charge Profile



Voltage Regulated (IUU) Charge Profile



Relation between Charge, Voltage and Temperature



NOTES

1. Due to self-discharge characteristics of lead-acid battery technologies, batteries should be top charged within 6 months of storage to ensure optimum performance, prevent sulphation and permanent capacity loss.

2. Charge profile recommendations correspond to battery voltages at 25°C (77°F). For temperatures below, adjust +5mVPC/°C (+3mVPC/°F). Temperatures above, adjust -5mVPC/°C (-3mVPC/°F). Temperature compensated charging helps ensure optimum battery runtime and life performance.

3. Charge profile recommendations depend on application and charger. IUI (or IUI with Pulse) is appropriate for applications that require frequent and deep discharges. IUU is appropriate for applications that are on standby and cycled less frequently.

4. IUI with Pulse algorithm uses a pulse termination criterion. The finish current is pulsed on and off in order to keep the battery voltage at a minimum while still reaching target overcharge. If average VPC exceeds U2 and the charger output has been on for more than 30 seconds, the output is shut off until VPC falls to U3.

5. IUI Charge Profile (if applicable), may have a continuous float phase added (2.27VPC).