

**INTRODUCING THE
ALL NEW
N15DCSS
LARGE CAPACITY
12 V RV
REFRIGERATOR**

THE PROBLEM WITH RESIDENTIAL REFRIGERATORS

RV consumers are requiring more residential features and amenities

To meet their demands, many OEM's are offering large capacity 120V AC residential refrigerators

Unless you have an expensive on-board generator or solar powered inverter system, there is no power to the refrigerator while traveling or off the grid

Without power, temperatures rise in the refrigerator and food safety could become an issue



THE PROBLEM WITH RESIDENTIAL REFRIGERATORS

120V AC Residential refrigerators are not designed for mobile applications and RV use

The compressor systems are not designed for road vibration and operating on an incline

Warranty claims and ordering replacement parts is extremely difficult with residential refrigerator manufacturers

RV dealers are not trained to work on residential refrigerators, and service after the sale is difficult



THE SOLUTION?



THE LEADER IN RV REFRIGERATION

In 2019, Norcold introduced to the industry the first 12V DC 10 cubic refrigerator designed from the ground up specifically for RV use

DC refrigerators are powered by coach batteries or solar panels giving your customers the flexibility to travel without auxiliary generator power



NORCOLD 12V DC REFRIGERATORS



N10DCSS – 10 Cubic Foot



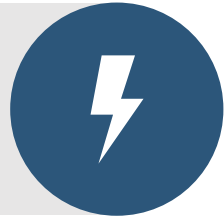
RV ROAD READY FEATURES OF NORCOLD 12V REFRIGERATORS

- High End Residential Style Refrigerator Features
- Lowest energy use in the industry for extended use on 12V power
- Easily powered with solar panels
- Programable electronic controls for consumer customization
- Ultra – Quiet compressors design with energy efficient night mode
- Custom cabinet mounting system designed for easy installation
- Designed to fit existing Norcold Gas absorption cabinet openings – No coach re-engineering required



INTRODUCING NORCOLD POLAR 12 VOLT DC RESIDENTIAL REFRIGERATORS

NORCOLD SOLVES DC POWER LIMITATIONS MAKING LARGE CAPACITY DC REFRIGERATORS A REALITY



60 years of mobile refrigerator knowledge has allowed Norcold to design an exclusive DC compressor system for the RV Industry

Focusing on minimal power use and maximum run time, Norcold's exclusive compressor system makes large capacity residential refrigerators a reality

Competitors are using traditional 120 V AC compressor systems and converting them to DC power

Converted compressors draw a significant amount of power limiting the 12V refrigerators run time

High power use by converted compressor systems have limited run time on 12 V power

THE FORD
NORCOLD®

KEY FEATURES AND ADVANTAGES

- Residential Design Integrating RV Road Ready Features
- Largest Capacity DC Refrigerators in the Industry
- Lowest Power Draw in the Industry for Extended Off Grid Camping
- The Go Anywhere Refrigerator – Full Power to Refrigerator While Traveling and Off The Grid



THE NORCOLD POLAR DC ADVANTAGE



INTRODUCING THE NORCOLD N15DCSS - 12V REFRIGERATOR



- 15 Cubic Foot Capacity 12V DC Refrigerator
- Designed to fit the same opening as the 1210 - 12 cubic foot Norcold Gas Refrigerator
- No Cabinet Redesign Required to Switch from Gas Absorption to DC Models.
- Self Vented – No Exterior Vents Required.
- Fully Insulated Foam Filled Stainless Steel French 3-Door Design
- Freshfood - French Door Refrigerator
- Freezer Slide-Out Drawer
- Integrated Recessed Door Handles with Travel Latches & Blue Accent Lighting
- Door Mounted Customizable Computerized Control Panel



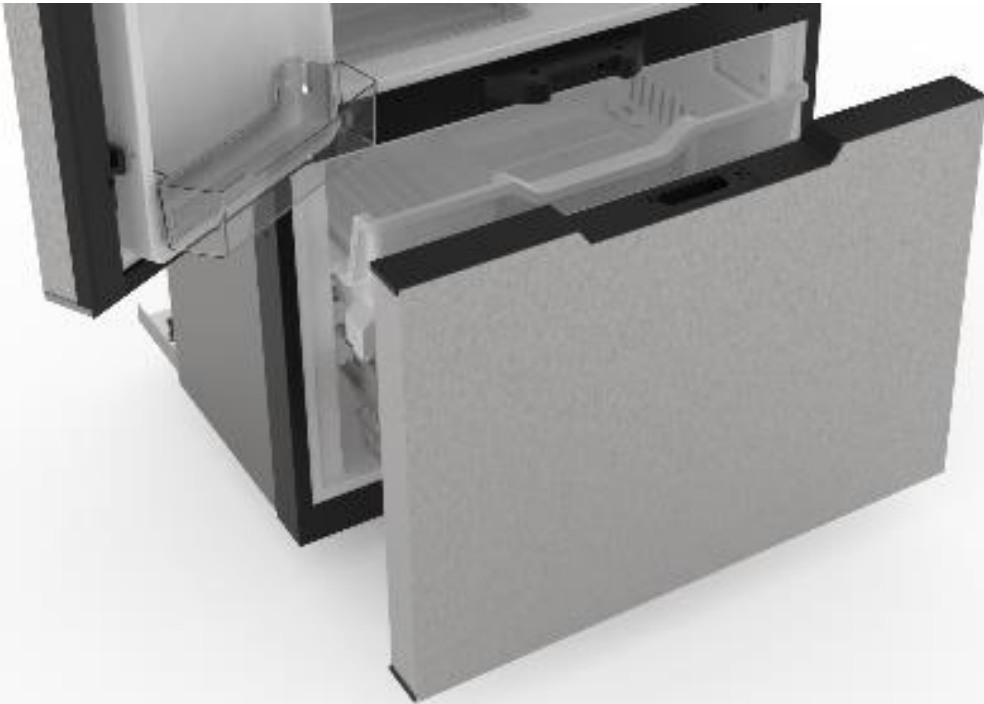
N15DCSS – INTERIOR DESIGN FEATURES



- Multiple Adjustable Glass Shelves with food fence to Prevent Shifting During RV Travel
- Adjustable Sliding Half/Full Shelf for Tall Bottle Storage
- 2 Liter Bottle Storage in Door
- Adjustable Door Bins
- Clear Crisper Bins
- Ultra - Bright LED Lighting with Door Switch
- Interior Air Circulation Fan for Even Cooling



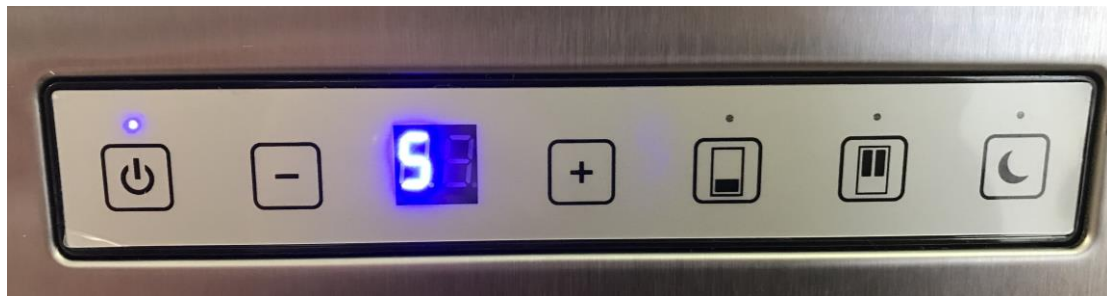
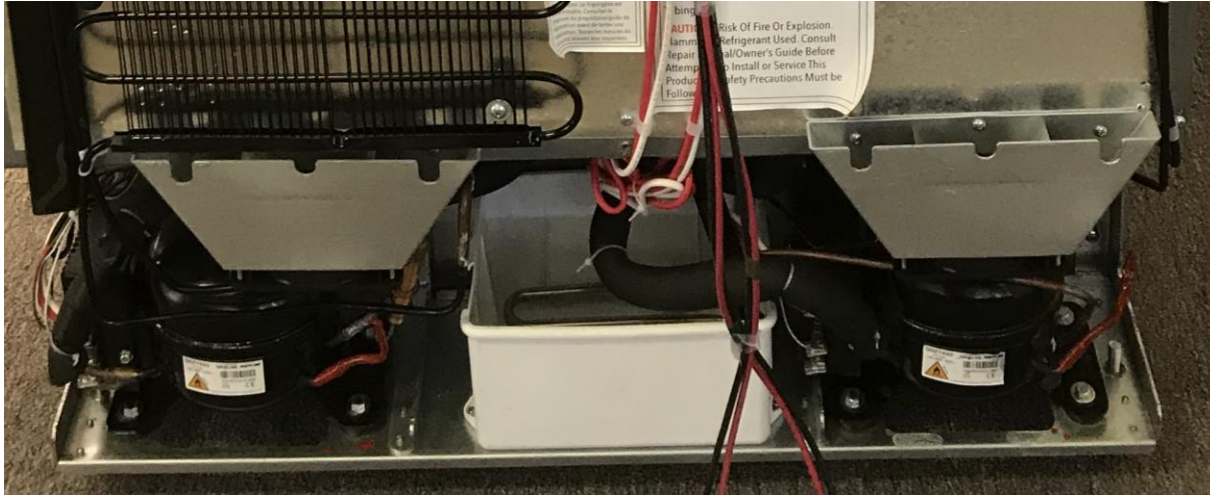
N15DCSS – INTERIOR DESIGN FEATURES



- Ultra Deep Wire Freezer Baskets
- Drawer Extends to the Depth of the Lower Basket to provide Full Access to bin
- Sliding Upper Freezer Drawer for Small Frozen Item Storage
- Door Latch Designed to Prevent Draw Opening During Travel



N15DCSS – DUAL COMPRESSOR TECHNOLOGY



- Dual Compressor Technology - Separate Compressors Control the Refrigerator and Freezer Independently
- Dual Compressors Reduces Amp Draw to Minimize Energy Use and Maximize Run Time on 12V Power
- Fully Computerized Control Panel and Separate Thermostats Promotes the Most Consistent Temperature Control of any 12V Product in the Industry
- Computerized Controls Allow Customers to Customize Cooling to their Preference.



N15DCSS – MULTI-FUNCTION ELECTRONIC CONTROLS



Norcold is the only company that offers 12V refrigerators that were completely designed from the ground up for mobile use. (Not a converted 120V AC residential refrigerator)

Norcold is the only brand that operates the freezer and refrigerator independently to assure consistent and level temperatures

- Exterior Door Mounted Five Function Control Center with Independent Controls for Refrigerator and Freezer
- “Nearly Silent” Compressor Design - Less than 34DB on Day Mode
- Multi Speed Compressors with Night Mode Setting to Conserve Energy and Reduce Compressor Noise
- Blue Accent Lighting Showing Door Handle Locations – With On/Off Switch
- On/Off Control with Stand By Mode and Power Loss Memory
- Door Open Alarm and Digital Error Code Reporting



N15DCSS – PERFORMANCE



- Exclusive Dual Compressor Technology Designed for Low Energy Use
- Shock Absorbing Compressor Mounting System Designed for RV Use
- Exterior Direct Cooling Condenser System Maximizes Cooling Performance
- Refrigerator and Freezer Evaporator - Mounted Inside Liner
- High Volume Circulation Fans to Cool Compressor for Optimal Performance
- RV Incline Compressor Design - Does Not Require Coach To Be Level To Operate like 120V AC Refrigerators



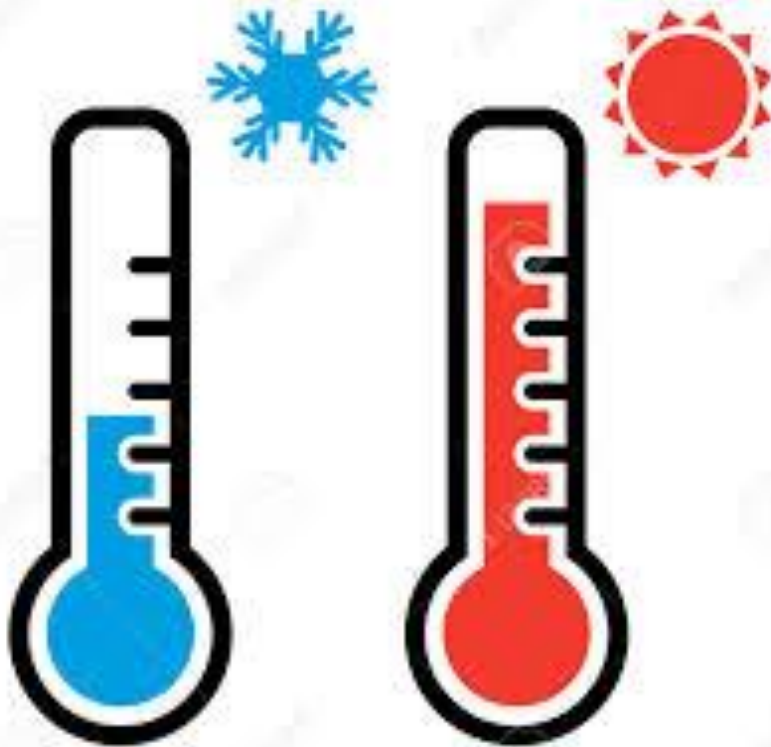
N15DCSS - EXTERIOR SIZE AND FEATURES

SKU	Description	Cutout Dimensions H' x W x D' (in)	Listed 12V/DC Amp Draw	Typical 12V/DC Amp Draw	Vent Rough Opening H' x W'	Weight (lb.)
N15DCSS	15-cu. ft., Stainless Doors	63.315 x 32.75 x 24	12.5A	6.5A	Not Required	216
N15DCIMSS	15-cu. ft., Stainless Doors W/Ice Maker	63.315 x 32.75 x 24	12.5A	6.5A	Not Required	216

- Designed to fit the 1210 12 Cube Gas Enclosure - No Cabinet Changes Required
- Lowest Amp Draw in the Industry – Only 6.5 Amps after Cool Down
- Available with an Optional Ice Maker



N15DCSS – EXCEPTIONAL COOLING



Average Operating Temperatures

- Freezer: 6 degrees plus or minus 3 degrees
- Refrigerator: 38 degrees plus or minus 3 degrees

Operating Ambient Environment Temperatures:

- Designed to Operate from 32 degrees to 120 degrees

Storage Ambient Environment Temperatures:

- Designed to be stored -31 degrees to 158 degrees

Humidity Operating Range

- 10% to 95% Humidity



N₁₅DCSS – COOLING SYSTEM



- Low Energy Use - estimated 20 hours of run time based on a single battery
- Allows Refrigerator to Run With One Solar Panel for Extended Off Grid Use
- 50 State, Canada, Europe, Australia and China Legal Low Environmental Impact R600A Refrigerant
- R600A is Non-Toxic with Zero ODP (Ozone Depletion Potential) and Very Low GWP (Global Warming Potential)
- R134A is Commonly Used in Residential Refrigerators and is now banned in most US States.



DESIGNED FOR EASY OEM INSTALLATION



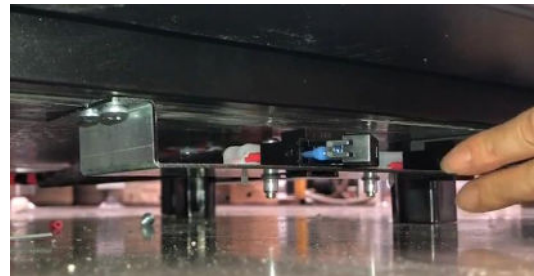
Cabinet
Mounting Holes



Rear Mounted Buss
Block 12V Hook Ups



Wall Bumpers



15 Amp
Automotive Fuse



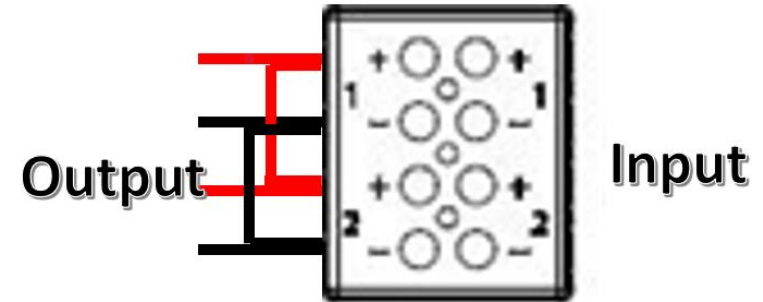
Adjustable
Leveling Feet

- Easy 5 Minute Installation
- Mounts To Cleats Behind Cabinet Face Frame with 8 Mounting Holes– Includes #8 Screws and Mounting Hole Covers
 - No additional mounting brackets or tie down straps required
- 12V Connection Located on Back Of Refrigerator To Reduce 12V Lead Wire Length
- Rear Rubber Wall Bumpers Provides Proper Spacing
- Adjustable Leveling Feet
- Replaceable 15 Amp Automotive Fuses (one per compressor) Mounted Under the Unit. Can be Replaced without Taking Unit out of the Enclosure.



WIRING DESIGNED FOR COMMON OEM INSTALLATION PROCESSES

- Maximum amp draw is just under 12.5 amps
- Currently the maximum draw for each circuit is less than 6.5A (for a short period of time)
- The requirement was to have no more than 225 milli volt drop from the battery to the compressor to preserve battery life
- Wiring block allows for a single +/- hook up or dual hook up to allow for the most flexibility in choosing wire sizes.



US3 Cable Size Acceptance			
	AWG	Cable Length Feet Max	Cable Strand Count
Single Cable Negative & Positive	10	0 - 15	>= 19
	8	0 - 20	>= 19
	8	0 - 25	>= 133
	6	0 - 40	>= 133
	6	0 - 45	>= 266
Two Negatives & Two Positives	10	0 - 30	>=19
	8	0 - 45	>=19

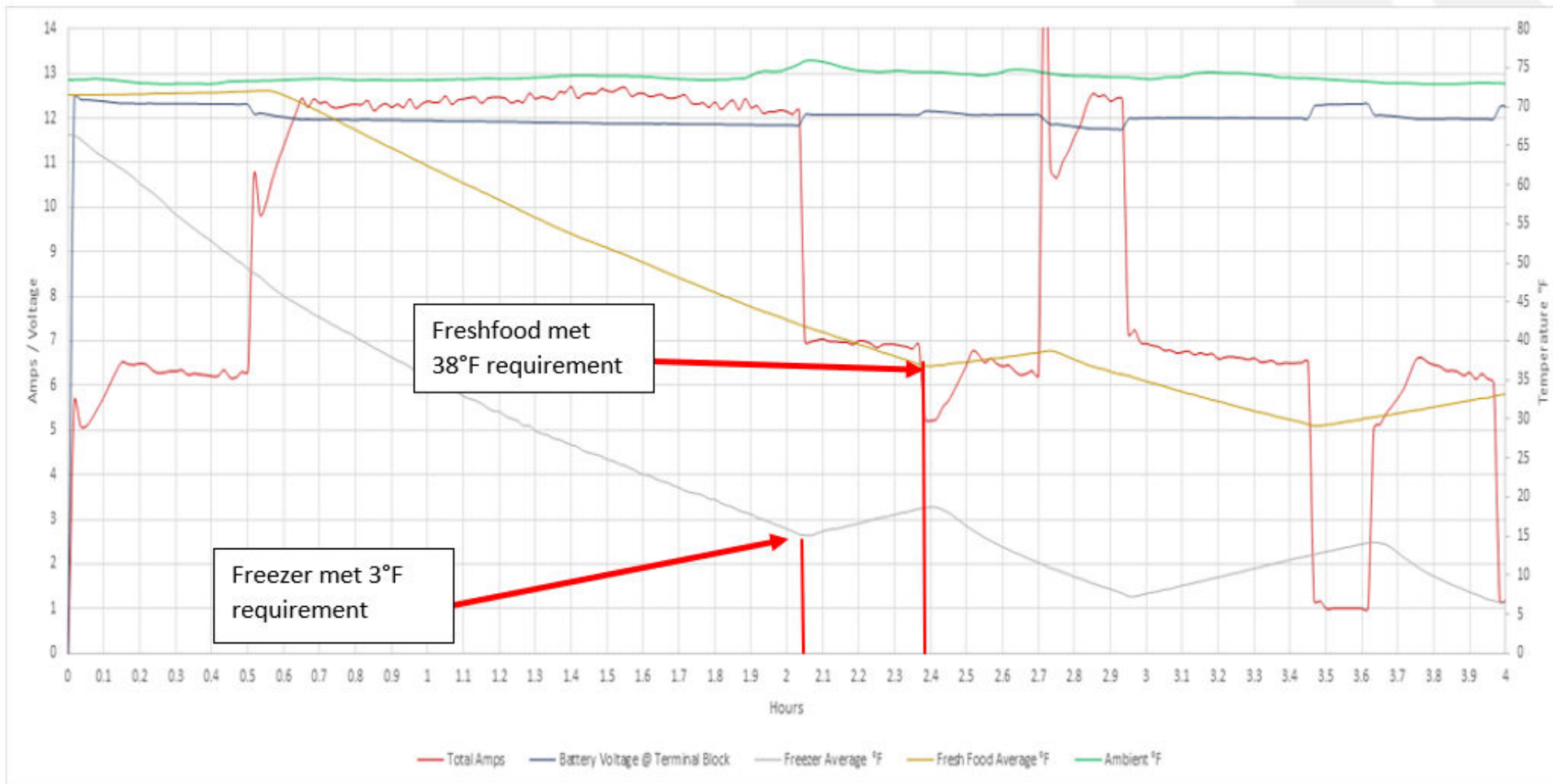


N15DC – PERFORMANCE SPECIFICATIONS

Interior Space	14.9 cubic ft.
Appearance	Residential w/flat SS doors
Weight	215
Energy Source	DC Only
DC27 Battery	13.75 Hrs.
AGM Battery	22 Hrs.
Lithium Battery	24 Hrs.
Max Amp Draw	11.67 Amps
Avg. Amp Draw	4.75 Amps
Temp draw down time empty 40 Degrees in refer and 30 Degrees in freezer.	2 Hrs.
Recovery time after adding bottled water with ambient temp. 62 degrees to freezer and refer.	8 Hrs.
Minimum Operating Voltage	10.5
Ventilation	Top Mounted - No Exterior Vents Required
Construction	RV Ready



N15DC PULLDOWN & OPERATING TEMPERATURES



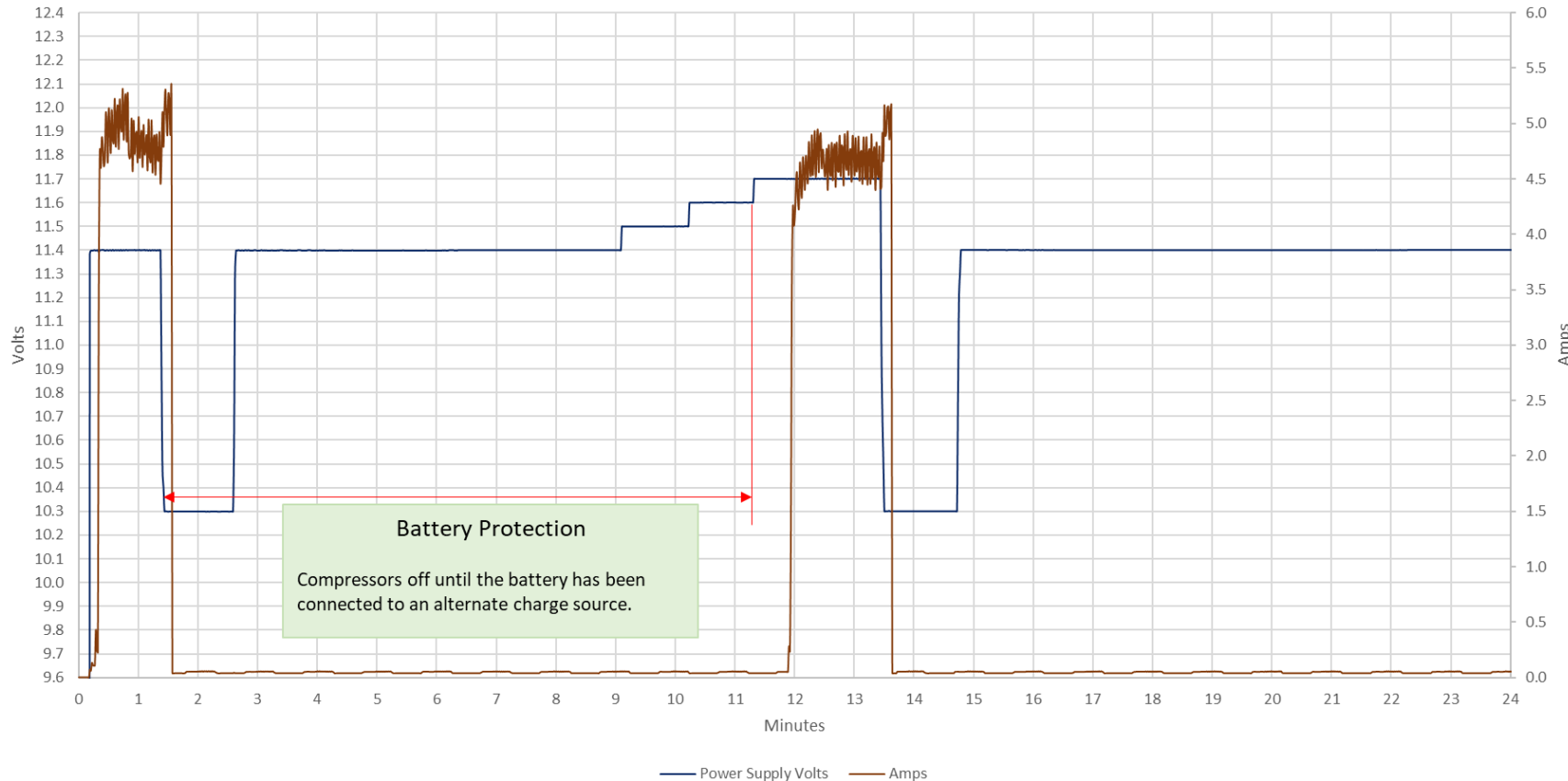
Norcold recommends that a Gas Absorption Refrigerators should run for 8 hours to stabilize and to be for use.

A N15DC stabilizes in less than 2 ½ hours and is ready for use.



N15DC POWER MANAGEMENT – PROTECTING THE BATTERY

Norcold US3 11.7 Voltage Latch Test
Prevents Battery Damage After The Battery is 100% Depleted



Norcold Tests and designs all units to preserve battery life for all their DC products

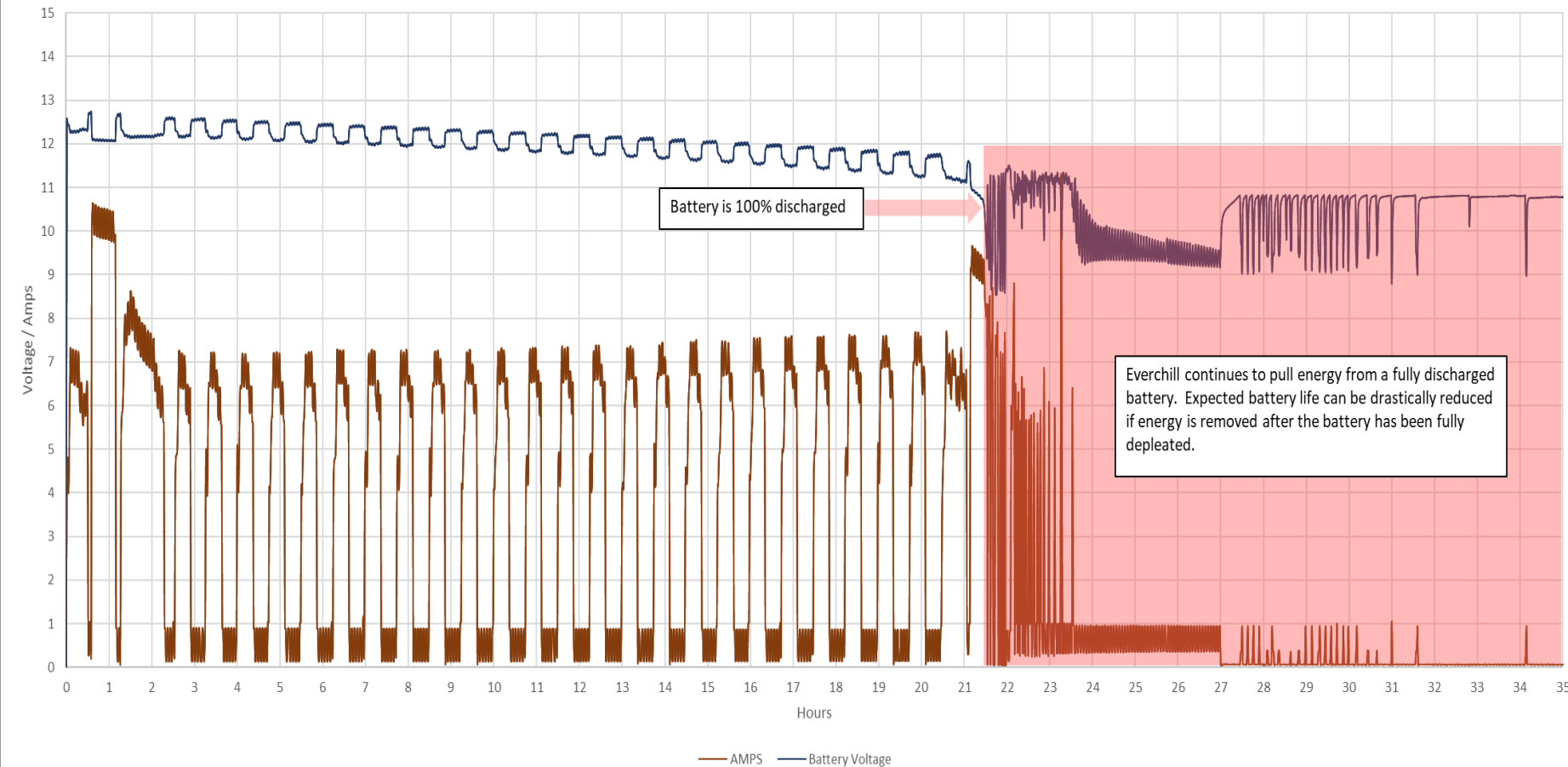
Per the manufacturers of lead acid battery, a battery is considered to be drained or “dead” at 10.4V. Continuing to draw energy after the battery drops below this will damage the cells of the battery and greatly reduce the time and warranty of the battery

Norcold has developed its power management system to cut out at this voltage level to protect the battery as well as allow it to sufficiently charge before restarting the compressors

10.4V Cut out/11.7V Cut in

N15DC ENERGY USE – RUN TIME ON BATTERY POWER

Everchill Model BCD-455WTE-B-04H
Trojan 27TMX Battery Run Test



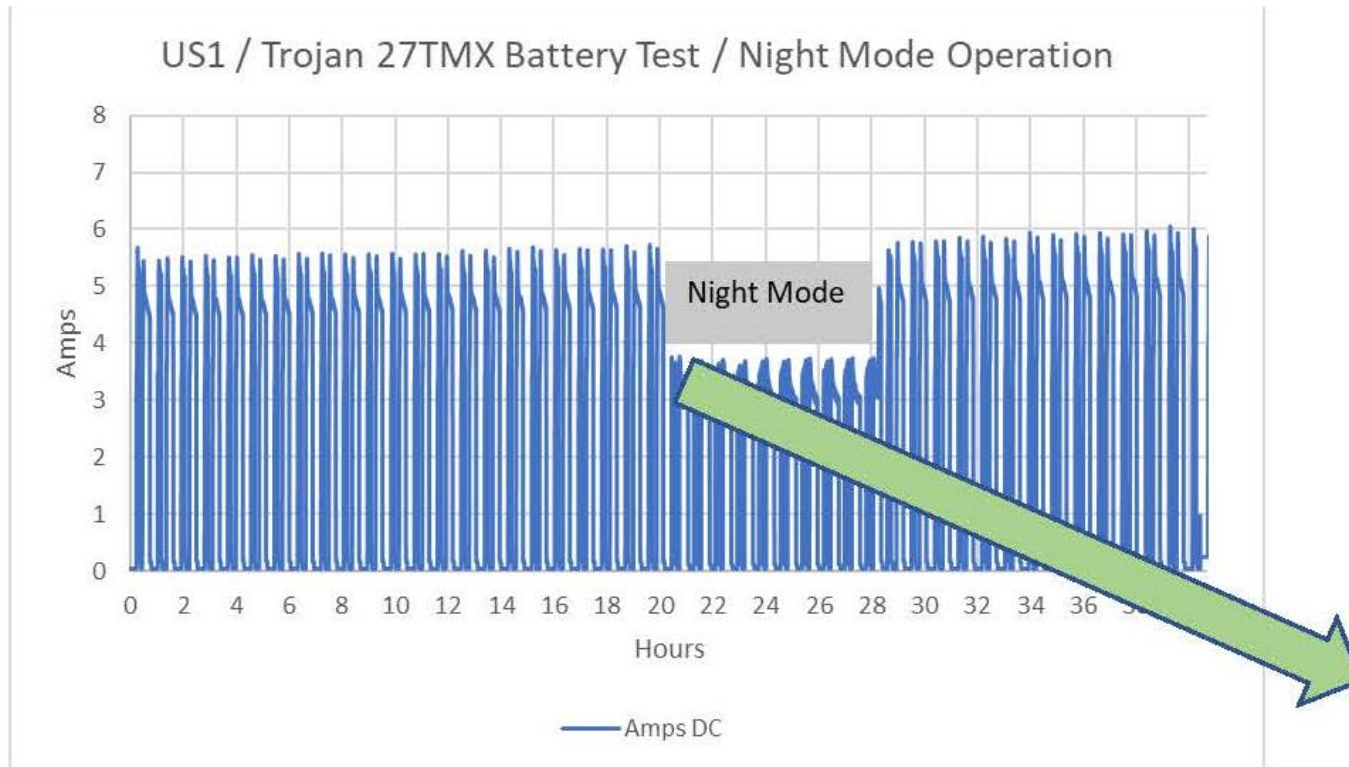
Testing has shown that competitors models do include utilize battery protection methods

Competitors models constantly draw from the battery until it is fully discharged

By failing to manage the battery life the overall quality and life of the battery will be destroyed



NORCOLD'S EXCLUSIVE NIGHT MODE



Norcold is the only brand to feature a Night Mode.

The night mode is fully programmable. On the default setting, the night mode runs for 8 hours.

The night mode is used to reduce the compressor speed while guests are sleeping to minimize decibel levels.

DECIBEL LEVELS:

Norcold – Day Mode - Only 39 DBA

Norcold – Night Mode - Only 34 DBA

“That’s quieter than a library”



NORCOLD DOOR PROTECTORS



Norcold Features Foam Injected Stainless Steel Doors on all 12V Models.

To protect the doors during production, all models include a heavy-duty double wall disposable corrugated protection panels.

The doors are also covered with a peel coat plastic film. Both are usually removed in final finish to protect the doors during the production process.



THEFORD
NORCOLD®

THANK YOU

