



EPIC Series Walk-In Enclosure 2.0 Specification

EPIC Series Enclosure shall be furnished in accordance with the following specification.

1. General

- 1.1. The EPIC Series Enclosure 2.0 is a prefabricated modular enclosure to be delivered ready for installation. The electrical system shall be prewired and ready for AC and DC mains connection.
- 1.2. The EPIC Series Enclosure 2.0 is designed to allow multiple operators or maintenance personnel to walk into the enclosure and perform work on electrical equipment. The EPIC Series Enclosure 2.0 will protect technicians, batteries, chargers, and other ancillary equipment from outdoor elements.
- 1.3. The EPIC Series Enclosure 2.0 is a modular design that is expandable to accommodate any variation of equipment.
- 1.4. The EPIC Series Enclosure 2.0 will incorporate the Hindle Health System. Further specification of this feature can be found in section 8.7.
- 1.5. The EPIC Series Enclosure 2.0 will be referenced as the 'enclosure' from this point forward in the specification document.

2. Applicable Codes and Certifications

- 2.1. The enclosure shall be constructed to be NEMA Type 3R rated, which provides protection against falling rain, sleet, snow and external ice formation while allowing safe ventilation of hydrogen gas.
- 2.2. IBC 2012, Seismic certified, essential equipment
- 2.3. CBC 2013, Seismic certified, essential equipment
- 2.4. IEEE 693 High, Seismic certified, essential equipment or IBC 2012
- 2.5. Complies with NFPA 70, National Electric Code
- 2.6. Roofing system to be ASTM E 1592 compliant
- 2.7. Complies with ASCE 7
 - 2.7.1 Design shall be certified by a licensed PE and include
 - Live loads
 - Roof snow loads
 - Wind loads
 - Roof collateral loads
 - Load combinations

3. Ventilation

- 3.1. The incoming air shall enter the enclosure through a filtered vent that prevents the entrance of rain, sleet, snow, insects, dust, or other airborne contaminants.
- 3.2. Air within the cabinet shall be ventilated in accordance with IEEE/ASHRAE 1635 'Guide for the Ventilation and Thermal Management of Batteries for Stationary Applications'



4. Hardware

- 4.1. Design shall utilize corrosion resistant 316 stainless steel hinges.
- 4.2. All fastening hardware shall be a minimum grade of 18-8 stainless steel.
- 4.3. All fastening hardware exterior to the console shall include a non-metallic washer.

5. Construction

- 5.1. Construction of the frame shall be of aluminum 6061-T6 or steel, tube, assembled via mechanical fasteners or welded with proper filler material at all joints by certified welders. Framing will exist at the base spanning the width at a distance that supports 250lbs/sq ft.
- 5.2. Interior mounting of equipment and non-critical framing shall include painted 1.625" P1000H3 Unistrut® or similar.
- 5.3. Walls to consist of modular injection foam panels.
- 5.4. Base steel shall be no less than 12 gauge.
- 5.5. Door and exterior panel wall steel or aluminum shall be no less than 20 gauge.
- 5.6. Interior panel wall to consist of aluminum. Walls and ceiling shall have a minimum insulation value of R-18.
- 5.7. Wall panels shall be 36" x 72" or larger and allow for independent movement due to thermal expansion and contraction.
- 5.8. Floors shall have a minimum insulation value of R-12.
- 5.9 The interior of the enclosure shall allow for clear unobstructed access to the batteries.
 - 5.9.1 There shall be no framing or structural supports in the walking area.
 - 5.9.2 The walking area shall accommodate a minimum of 3' of clear working space from the energized terminals of the battery.
- 5.10 The floor shall be made of material resistant to battery acid and designed for loading of up to 250 lbs. per square foot.
- 5.11 Minimum interior height shall be 8'.
- 5.12 Doors shall have ability to lock in the open position.
- 5.13 The roof shall be pitched a minimum of 1 inch per 1 foot and able to support 40 pounds per square foot.
- 5.14 The roofing system shall be in compliance with ASTM E 1592
- 5.15 The console design shall deny water penetration via exterior seams, by the use of interlocking sheet metal, gaskets and/or 100% 50 year life butyl rubberized caulk sealant (color to match adjoining surface) or equivalent.
- 5.16 Doors shall have three-point latching system with panic or crash bars on the interior and open away from existing building.
- 5.17 The design shall allow for conduit entry via the bottom sides of the console base, customer to specify site requirements prior to construction.
- 5.18 Deflection limits of the following must be kept to 1/240 of span or less.
 - 5.18.1 Purlins, rafters, and other roof framing members
 - 5.18.2 Girts, studs, and wall framing members
 - 5.18.3 Metal roof panels
 - 5.18.4 Injected foam wall panels
- 5.19 Drawings shall specify Hilti anchoring system.

6. Battery Rack System

- 6.1 P1000H3 Unistrut® based system or battery rack to accommodate a variation of battery sizes and arrangements.



- 6.1.2 Each battery support is fully rated to handle the battery weight per applicable codes outlined in section 2. Rails are insulated with an electrolyte resistant nonconductive rubber rail cover.
- 6.1.3 Battery rail shall be supported by brackets that bolt into Unistrut® and allow for field modification, if required.
- 6.1.4 The enclosure shall allow for a single row, double tier, battery arrangement utilizing multi-cell units.

7. Electrical Design Specifications

- 7.1 Enclosure shall be delivered in modular sections.
 - 7.1.1 Battery installation not included in the scope of work.
- 7.2 Enclosure shall provide grounding stud/clamp at each bottom corner of enclosure.
- 7.3 Enclosure electronics section shall house a 12 position, Square D, AC distribution for environmental options. All unused positions shall hold a spare branch breaker.
- 7.4 Enclosure wiring uses XLPE wire per HindlePower standard CB0002.
- 7.5 Enclosure shall include an exterior 50 Watt or 4500 lm LED fixture mounted above each entry door.
- 7.6 All critical electrical components, with the exception of AC and DC distribution, shall be replaceable with minimal field wiring.
- 7.10 LED interior lights will be supplied from the AC source with DC backup.

8 System Control and Monitoring Specifications

- 8.1 Microprocessor based HindleHealth System controller shall be incorporated into the console for control and monitoring of basic system functions.
- 8.2 The System Controller shall provide red and green indicators on the exterior of the enclosure for system status per HindleHealth System.
 - 8.2.1 HindleHealth system status shall be shown on an HMI internal to the enclosure.
- 8.4 System Controller Inputs
 - The following shall be inputs to the System Controller:
 - 8.4.1 Temperature probe(s)
 - 8.4.2 Fan on/off
 - 8.4.2 AC unit failure
 - 8.4.4 Charger common alarm
 - 8.4.5 Provisions for common alarm from 3rd party equipment dry contacts
- 8.5 System Controller Outputs
 - The following shall be outputs from the System Controller to the system:
 - 8.5.1 Heater relay control
 - 8.5.2 Vent fan relay control
 - 8.5.3 AC unit controller relay control
 - 8.5.4 Common alarm
 - 8.5.5 User specified custom outputs
- 8.7 The enclosure shall come standard with the Hindle Health® System. The health system monitors the internal environment, system components, and will alert via Hindle Health® System status lights when attention is required.



8.7.1 The Hindle Health System shall monitor and provide alarming for the following devices:

- 8.7.1.1 Battery Chargers,
- 8.7.1.2 Battery Monitors,
- 8.7.1.3 Enclosure System Controller
- 8.7.1.4 Any third-party equipment with alarm outputs

8.7.2 Enclosure shall have two, 20 lm outdoor LED indicators, exterior to the cabinet, displaying the system health status (HHS).

- 8.7.2.1 Green indicates proper system operation
- 8.7.2.2 Red indicates system requires attention
- 8.7.2.3 Blinking red indicates a critical failure of interior equipment or extreme internal environmental temperature.

9. Finish

- 9.1 Standard finish, white epoxy powder coat, 49/10103, RAL 9010.
- 9.2 Custom colors to be offered as an option.

10. HVAC & Environmental

- 10.1 The heating, ventilation and air conditioning system shall be adequate to maintain a temperature of 65°F to 78°F.
- 10.2 System shall safely mitigate hydrogen to a level of 2% by volume and a safety factor of 2 times below the minimal explosive limit of 4% by volume.
- 10.3 Each feature controlled by the System Controller shall have remote monitoring capabilities.

11. Safety Features

- 11.1. All doors shall have push type panic bars for exiting the console.
- 11.2. The following features can be included as safety options:
 - 11.2.1. The battery section shall include an eyewash station p/n
 - 11.2.2. 10lb ABC fire extinguisher to be mounted in electric and battery compartments.
 - 11.2.3. Smoke detector, with alarm output capability, to be mounted in electric and battery area of enclosure.

12. Standard Features

- 12.1. Drawing package shall include the following:
 - 12.1.1. Outline Drawing
 - 12.1.2. Internal Drawing
 - 12.1.3. Schematic Drawing
 - 12.1.4. Connection Drawing
 - 12.1.5. Installation Drawing
 - 12.1.6. Bills of Material (Parts data package)
- 12.3.1 240Vac 450 Watt Heaters
- 12.3.2 24Vdc 115cfm Ventilation Fan(s)
- 12.3.4 HVAC System with washable air filter
- 12.3.5 Internal low voltage 12Vdc LED lighting with switch.
- 12.3.6 (2) 120Vac 20A GFCI outlet



- 12.3.7 Battery Spill Containment
- 12.3.8 HHS integration of 3rd party equipment

13. Optional Features

- 13.1 (1) 200A AC and (1) 200A DC disconnect switch shall be mounted on the exterior of the enclosure
 - 13.1.1.1 Disconnects to be manufactured by Square D and be rated for NEMA 4X
 - 13.1.1.2 DC disconnect to be delivered with factory installed DC slugs.
- 13.2 Enclosure can be delivered turnkey ready to be energized.
- 13.3 Outdoor GFI.
- 13.4 Emergency lighting
- 13.5 Hilti HDA-T Series anchors
- 13.6 Lifting eyes
- 13.7 All data internal to the enclosure can be aggregated by Bruno, DC System Watchdog via Modbus over Serial or Modbus over Ethernet. This includes communication to and from Bruno, DC System Watchdog, System Controller, and Evo AT Series battery chargers.