

What to Look For in a Battery Enclosure for Solar Systems

The following is a discussion on understanding the necessity for, regulations of, and types of enclosures.

Introduction to Battery Enclosures

Okay, so you've made the jump towards utilizing solar, but now what? An important next step in utilizing solar effectively for your business is to choose the system you need and the proper method to protect it.



What is a Battery Enclosure?

A battery enclosure is a box designed to protect batteries from potential weather and battery mishaps. They can be designed for indoor or outdoor use, and may include room for electronics. Specific designs allow for pole, wall, or ground mounted systems.



Why Do I Need One?

Battery enclosures are essential components of off-grid solar systems for a number of reasons including: physical protection from outside elements including people and weather patterns, maintaining consistent temperatures, and meeting the requirements of the National Electric Manufacturer's Association (NEMA).



Which Types is Right for Me?

The specific type of battery enclosure design is different given the application and requirements of the project. The features and functions differ depending on the location and needs of the system. In general, all battery enclosures should be vented. This includes VRLA batteries, as hydrogen gas could potentially build up in a fault condition (e.g. controller failure). Passive venting should be adequate and active venting, like a fan, should only be required in rare cases. NEMA provides a rating scheme for consumers to easily decipher the correct number associated with his/her needs.

Rating Schemes

Two common methods of measuring the quality of protection offered by battery enclosures are the Ingress Protection Rating and the NEMA rating. IP and NEMA ratings are similar yet different; the NEMA code of protection can be said to be equivalent to the IP rating, but the same does not hold true for the IP rating.

Ingress Protection Rating

The IP rating is a standard evaluation of battery enclosures common in Europe. The given value contains 2-3 numbers to depict the level of protection from solid foreign objects and water.



[Click here](#) to see the relationships between IP ratings and NEMA Ratings!

NEMA Rating

The NEMA rating on the other hand is commonly used in North America. It considers the IP rating as well as other specifiers such as corrosion and construction details. The scale ranges from 1-13 with 7-10 being designed for Hazardous Locations and 1-6, 11-13 designed for Non-Hazardous Locations.

These are the types of NEMA enclosure ratings, and their various forms of protection in outdoor nonhazardous locations. **All SunWize enclosures are designed to NEMA3R, which provides a high degree of protection from the elements in rugged and exposed outdoor locations.**

Table 2
[From NEMA 250-2003]
Comparison of Specific Applications of Enclosures
for Outdoor Nonhazardous Locations

Provides a Degree of Protection Against the Following Conditions	Type of Enclosure									
	3	3X	3R*	3RX*	3S	3SX	4	4X	6	6P
Access to hazardous parts	X	X	X	X	X	X	X	X	X	X
Ingress of water (Rain, snow, and sleet **)	X	X	X	X	X	X	X	X	X	X
Sleet ***	...	...	...	...	X	X	...	...	...	...
Ingress of solid foreign objects (Windblown dust, lint, fibers, and flyings)	X	X	...	...	X	X	X	X	X	X
Ingress of water (Hosedown)	...	...	...	...	...	...	X	X	X	X
Corrosive agents	...	X	...	X	...	X	...	X	...	X
Ingress of water (Occasional temporary submersion)	...	...	...	...	...	...	...	...	X	X
Ingress of water (Occasional prolonged submersion)	...	...	...	...	...	...	...	...	...	X

* These enclosures may be ventilated.
 ** External operating mechanisms are not required to be operable when the enclosure is ice covered.
 *** External operating mechanisms are operable when the enclosure is ice covered.

Indoor, Outdoor, and Side of Pole (SOP)

Indoor Enclosures

Indoor enclosures may not have complex designs. Due to the simple features required of an indoor enclosure, it may only be composed of a battery rack with panels attached to it. In most cases, the indoor enclosure only needs to prevent things from falling onto the battery, so typically a NEMA 1 rating is fine. The enclosure may need to be externally vented depending on the building requirements that house the battery. In most industrial applications, if the batteries are installed in a dedicated space, a separate enclosure is not required.



Outdoor Enclosures

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Side of Pole (SOP) Enclosures



Smaller battery enclosures can be mounted on a pole or a wall. Usually up to 300-400 lbs, larger enclosures are placed on the ground, slab, or foundation. Practical limitations usually prevent too many batteries or too much weight from being installed on the pole or wall. Larger ground mount enclosures usually do not have any limits. Side of Pole enclosures offer easier access and maintenance to lighter-weight systems.

Conclusion

Battery enclosures come in all shapes, sizes, materials, and ratings; choosing the best one that works for the application and requirements is a simple, yet crucial process. For more information on finding the perfect enclosure for your business needs, give SunWize a call or click on the button below to view enclosures online!

[View our Enclosure Catalog Now](#)

Next Steps

After reviewing our Enclosure Catalog, head over to our web store where you can view photos, place orders online 24/7, and find lots of additional information on all of our enclosure product lines!

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