

Enclosure Types

Overview

The enclosure is one of the most overlooked parts of a commercial generator, yet it has a major impact on reliability, noise levels, airflow, safety, and overall performance. Choosing the right enclosure ensures the generator can operate in your environment without overheating, corroding, or exposing the system to unnecessary risk.

Primary Enclosure Types

There are three primary enclosure types used in industrial and commercial applications: weatherproof enclosures, sound attenuated enclosures, and open skid configurations. Each one is designed for specific conditions and installation requirements.

Weatherproof Enclosures

A weatherproof enclosure is the standard choice for most outdoor generator installations. These enclosures shield the engine and alternator from rain, snow, wind, humidity, and debris. They are built from durable steel or aluminum and are designed to protect the generator in year round outdoor environments. Weatherproof enclosures include louvered panels and internal airflow paths that bring cool air in and push hot air out while keeping moisture away from sensitive components. This enclosure type is ideal for locations that need dependable protection without noise restrictions.

Sound Attenuated Enclosures

A sound attenuated enclosure is designed for noise reduction. These enclosures include insulated panels, upgraded airflow channels, and acoustic materials that reduce operating noise to meet local noise ordinances or site requirements. Sound attenuated units are often used in commercial areas, schools, hospitals, residential zones, and any environment where noise control is a priority. These enclosures require precise ventilation engineering to prevent overheating and maintain safe airflow.

Open Skid Configurations

An open skid configuration has no enclosure at all. These generators are typically installed indoors, in mechanical rooms, or inside purpose built generator houses. Without an enclosure, airflow is supplied by the building, and noise reduction or weather protection must be handled by the facility. Open skid units provide easy access for maintenance and are often used in larger plants, industrial facilities, and indoor power rooms. They rely heavily on proper ventilation planning and are usually paired with engineered ducting to manage heat and airflow.

Specialized Enclosure Features

Some enclosures are built with additional features depending on the application. Cold weather environments may use enclosure heaters to prevent freezing of critical components. Coastal regions may require corrosion resistant coatings to protect against salt air. High heat regions may require enhanced airflow or upgraded cooling systems. Mobile enclosures are mounted on trailers for rental and temporary power applications, and they include lockable doors, sound insulation, and reinforced structures for transport.

Airflow Requirements

When selecting an enclosure type, airflow is one of the most important considerations. Generators create significant heat. The enclosure must allow cool air to enter and hot air to exit without obstruction. Poor airflow causes high operating temperatures, reduced performance, and shutdowns under load. Selecting the right enclosure for your environment is just as important as selecting the generator itself.

Security Considerations

Security is another key factor. Enclosures protect generators from unauthorized access, wildlife, theft, and vandalism. Locking doors, reinforced panels, and internal cable routing help secure the system, especially in public or high traffic areas.

Why Enclosure Selection Matters

Choosing the right enclosure ensures the generator operates at peak performance, meets local noise and safety requirements, and stays protected from weather and environmental challenges. With proper airflow management, secure construction, and the right environmental features, the enclosure becomes a long term asset that supports the reliability of your entire backup power system.