



Electrical Enclosure Ratings

Several ratings for electrical enclosures (control cabinets) exist. Ratings determine the worst environment within which those enclosures are to be used. If an enclosure is rated for outdoor use, it may also be used indoors. If an enclosure is rated for submersion, it may also be used outdoors, indoors, in a dusty environment, or where water is likely to be sprayed. In the US, enclosures are rated by the National Electrical Manufacturer's Association (NEMA), which sets the standards for construction of various types of enclosures. Underwriters Laboratories (UL) has also adopted this numbering system for testing of the various enclosures.

Type 1 enclosures: NEMA 1 enclosures are rated for indoor use to be proof against accidental entry into energized components within the enclosure. They are not intended to be proof against water or dust entry, but will keep out any item larger than 1/8" in diameter. This rating primarily is intended to prevent electrical injury to personnel.

Type 3 enclosures: NEMA 3 enclosures are rated for outdoor use to keep rain, sleet, and ice from entering the enclosure and preventing failure of operation of any disconnect handles attached to these enclosures. They are primarily intended to protect equipment from the weather, but also may be used indoors since they meet the criteria for NEMA 1.

Two sub categories exist, NEMA 3R and 3S. NEMA 3R enclosures are intended to be used outdoors to provide protection from rain to enclosed components. NEMA 3S enclosures are intended to be used outdoors to provide protection from sleet to enclosed components.

Type 4 enclosures: NEMA 4 enclosures are rated for indoor or outdoor use to provide protection to the enclosed components from the effects of water directed by hose from any direction. These enclosures may be used in place of NEMA 1, 3, or 12 since the requirements for NEMA 4 are more stringent than any of the other requirements.

A subcategory, NEMA 4X, exists which also requires that the enclosures be non corrodible. Most NEMA 4X enclosures are either stainless steel, fiberglass, or glass reinforced polyester. In enclosures which are non conductive, the panel on which the components are mounted must be electrically bonded to assure a positive ground.

Type 6 enclosures: NEMA 6 enclosures are rated for intermittent immersion. They provide protection tot he equipment enclosed from the effects of being submerged for intermittent periods.

A subcategory, NEMA 6P, exists which is rated for prolonged immersion of the enclosure. Either category includes rating for 1, 3, 4, or 12.

Type 12 enclosures: NEMA 12 enclosures are rated for indoor use, and protect the equipment within from dust, falling dirt, and dripping non corrosive liquids. Type 12 enclosures can also be used as type 1 enclosures.

Type 13 enclosures: NEMA 13 enclosures are rated for indoor use to provide protection to equipment from dust, spraying water, oil, and non corrosive coolants. Type 13 enclosures may also be used a types 1 and 12.