EEMAC environmental ratings
for enclosed disconnect switches

Introduction

An enclosure is a surrounding case constructed to provide a degree of protection to personnel against accidental contact with the enclosed equipment and to provide a degree of protection to the enclosed equipment against specified environmental conditions.

A brief description of the more common types of enclosures used by the electrical industry relating to their environmental capabilities follows.

Refer to EEMAC Standards Publication for more information regarding applications, features and design tests.

Individual EEMAC product Standards Publications or third party certification standards may contain additional requirements for product testing and performance.

Definitions pertaining to nonhazardous locations

Type 1

Enclosures are intended for indoor use primarily to provide a degree of protection against limited amounts of falling dirt.

Type 3R

Enclosures are intended for outdoor use primarily to provide a degree of protection against rain, sleet and damage from external ice formation.

Type 4

Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, hose-directed water and damage from external ice formation.

Type 4X

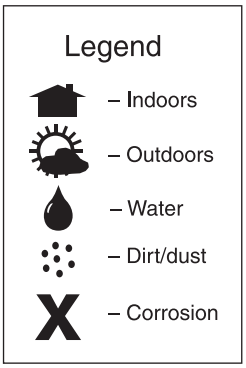
Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, hose-directed water and damage from external ice formation.

Type 12

Enclosures are intended for indoor use primarily to provide a degree of protection against circulating dust, falling dirt, and dripping noncorrosive liquids.

Type 13

Enclosures are intended for indoor use primarily to provide a degree of protection against dust, spraying of water, oil and noncorrosive coolant.



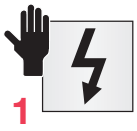
IP environmental ratings
for enclosed disconnect switches

IP ratings

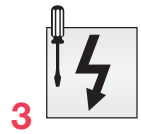
indicate the degree of protection against dust, liquids and impacts. The IP degrees of protection are defined by the French standard NFC 20-010. To rate a device's degrees of protection, the letters IP are followed by up to three numbers. These numbers are defined as follows:

first number
protection against solid objects

IP 0 — no protection


1 — protected against solid objects over 50mm (e.g. accidental touch by hands.)


2 — protected against solid objects over 12 mm (e.g. fingers)


3 — protected against solid objects over 2.5 mm (tools & wires)

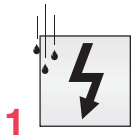

4 — protected against solid objects over 1mm (small tools & small wires)


5 — protected against dust (no harmful deposit)

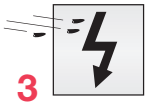

6 — totally protected against dust

second number
protection against liquids

IP 0 — no protection

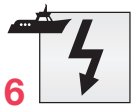

1 — protected against vertically falling rain or condensation


2 — protected against direct sprays of water up to 15° from vertical


3 — protected against sprays to 60° from vertical


4 — protected against water sprayed from all directions

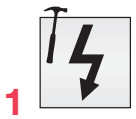

5 — protected against low pressure jets of water from all directions

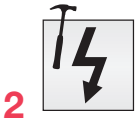

6 — protected from strong jets of water (e.g. for use on ship decks)

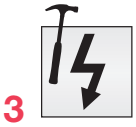

7 — protected against the effects of immersion between 15cm and 1m

third number
protection against mechanical impacts

IP 0 — no protection


1 — impact 0.225 joule
150g falling from 15 cm


2 — impact 0.375 joule
250g falling from15 cm


3 — impact 0.50 joule
250g falling from 20cm


5 — impact 2.00 joule
500g falling from 40 cm


7 — impact 6.00 joule
1.5kg falling from 40 cm


9 — impact 20.00 joule
5 kg falling from 40 cm