

NEMA and IP Ratings

Applications Note 811651
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NEMA Ratings

The National Electrical Manufacturers Association (NEMA) is a manufacturers organization in the USA which defines and promotes standardized product specifications for electrical appliances. Some of the ratings are summarized below and are for reference use only. Please consult with NEMA for their current definitions.

The NEMA website is at www.nema.org

NEMA Type

Description

- 1 Indoor use primarily to provide protection against contact with the enclosed equipment and against a limited amount of falling dirt.
- 2 Indoor use to provide a degree of protection against limited amounts of falling water and dirt.
- 3 Outdoor use to provide a degree of protection against windblown dust and windblown rain. Undamaged by the formation of ice on the enclosure.
- 3R Outdoor use to provide a degree of protection against falling rain; undamaged by the formation of ice on the enclosure.
- 3S Outdoor use to provide a degree of protection against windblown dust windblown rain and sleet; external mechanisms remain operable while ice laden.
- 4 Either indoor or outdoor use to provide a degree of protection against falling rain, splashing water, and hose directed water; undamaged by the formation of ice on the enclosure.
- 4X Either indoor or outdoor use to provide a degree of protection against falling rain, splashing water, and hose directed water; undamaged by the formation of ice on the enclosure.; Resists corrosion.
- 6 Indoor or outdoor use to provide a degree of protection against entry of water during temporary, limited submersion; undamaged by the formation of ice on the enclosure.
- 6P Indoor and outdoor use to provide a degree of protection against the entry of water during prolonged submersion at limited depths.
- 11 Indoor use to provide, by oil immersion, a degree of protection of the immersed equipment identified by the corrosion resistance test against the corrosive effects of corrosive liquids and gases.
- 12 Indoor use to provide a degree of protection against dust, dirt, dripping water and external condensation of non-corrosive liquids.
- 13 Indoor use to provide a degree of protection against lint, dust seepage, external condensation, and spraying of water, oil and non-corrosive liquids.



IP Ratings

The International Electrotechnical Commission (IEC) has set forth a set of definitions of ingress protection (IP) ratings. These ratings are summarized below. Please contact the IEC for the current definitions of the IEC rating program. The IEC website is at www.cbscheme.org.

IEC 529 Applies to the classification of degrees of protection provided by enclosures for electrical equipment with a rated voltage not exceeding 72.5 kV.

The IP Rating is a composite number which details the protection from solid objects (1st digit), and the protection from moisture (2nd digit).

| 1st Digit | Protection |
|------------------|---|
| 0 | Not protected. |
| 1 | Protected against solid objects greater than 50mm. |
| 2 | Protected against solid objects greater than 12mm. |
| 3 | Protected against solid objects greater than 2.5mm. |
| 4 | Protected against solid objects greater than 1.0mm. |
| 5 | Dust protected. |
| 6 | Dust tight. |

| 2nd Digit | Protection |
|------------------|---|
| 0 | No Protection. |
| 1 | Protected against dripping water. |
| 2 | Protected against dripping water when tilted up to 15°. |
| 3 | Protected against spraying water. |
| 4 | Protected against splashing water. |
| 5 | Protected against water jets. |
| 6 | Protected against heavy seas. |
| 7 | Protected against the effects of immersion. |
| 8 | Protected against submersion. |

***ALL DIMENSIONS SHOWN WERE ACCURATE AT TIME OF PRINTING. CTI RESERVES THE RIGHT TO CHANGE SPECIFICATIONS AT ANY TIME. PLEASE CONSULT WITH CTI ELECTRONICS FOR CURRENT SPECIFICATION DRAWINGS.**