NEMA and IP Ratings

Enclosures that meet or exceed NEMA 4 and or IP 66 (see IP standard and NEMA 4 information below)
CA-series (All except CA4)
I-Series
RB-series
S-series with PS (perimeter seal)
WM-series with PS (perimeter seal)
SE-series (all cases and all bottom panels)

IP Standard

International Standard IEC 60529 outlines an international classification system that describes the sealing characteristics of electrical equipment. The classification system defines the level of protection provided by enclosures to prevent the ingress of foreign objects and moisture into the electrical equipment. The classification system uses the "IP" code, or "Ingress Protection" code, to define the level of seal. The IP code uses a system of two numerical digits to define the level of both foreign object and moisture protection. Although the IP classification is primarily used for establishing the level of seal in electrical equipment, it is adapted herein for determining the level of seal in passive electrical components.

Degrees of Protection (Foreign Bodies) – 1st Digit

The first digit of the IP code indicates the degree of protection against solid foreign objects from entering the

electrical device. The table below outlines the level of protection against foreign objects for each level.

Degrees of Protection (Moisture) – 2nd Digit

The second digit of the IP code indicates the degree of protection against the ingress of various forms of moisture

(e.g. drip, spray, submersion, etc.) into the component. Tests to determine the level of protection are carried out

with fresh water and do not take into account the use of solvents.

Description of Protection Level 1st Digit (Foreign Bodies)

0 = Not protected

1 = Protected against solid foreign objects of 50 mm diameter and greater

2 = Protected against solid foreign objects of 12,5 mm diameter and greater

3 = Protected against solid foreign objects of 2,5 mm diameter and greater

4 = Protected against solid foreign objects of 1,0 mm diameter and greater

5 = Protected from the amount of dust that would interfere with normal operation

6 = Dust tight

Description of Protection Level 2nd Digit (Moisture)

0 = Not protected

1 = Protected against vertically falling water drops

2 = Protected against vertically falling water drops when enclosure is tilted up to 15 °

3 = Protected against water sprayed at an angle up to 60 ° on either side of the vertical

4 = Protected against water splashed against the component from any direction

5 = Protected against water projected in jets from any direction

6 = Protected against water projected in powerful jets from any direction

7 = Protected against temporary immersion in water

8 = Protected against continuous immersion in water, or as specified by the user

NEMA and IP Ratings

NEMA 4

What does NEMA 4 rated mean? In non-hazardous locations, there are several different NEMA ratings for specific enclosure "types", their applications, and the environmental conditions they are designed to protect against, when completely and properly installed.. The following provides an overview of the NEMA Types. For complete definitions, descriptions, and test criteria, see the National Electrical Manufacturers Association (NEMA) Standards Publication No. 250.

NEMA 1 – Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment and to provide a degree of protection against falling dirt.

NEMA 2 – Same as NEMA 1 including protection against dripping and light splashing of liquids.

NEMA 3 – Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, and windblown dust; and that will be undamaged by the external formation of ice on the enclosure.

NEMA 3R – Same as NEMA 3 excluding protection against windblown dust.

NEMA 3S – Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, and windblown dust; and in which the external mechanism(s) remain operable when ice laden.

NEMA 4 – Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; and that will be undamaged by the external formation of ice on the enclosure.

NEMA 4X – Same as NEMA 4 including protection against corrosion.

NEMA 5 – Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against settling airborne dust, lint, fibers, and flyings; and to provide a degree of protection against dripping and light splashing of liquids.

NEMA 6 – Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against hose-directed water and the entry of water during occasional temporary submersion at a limited depth; and that will be undamaged by the external formation of ice on the enclosure.

NEMA 6P – Same as NEMA 6 including protection against the entry of water during prolonged submersion at a limited depth.

NEMA 7 – Enclosures are for indoor use in locations classified as Class I, Groups A, B, C, or D and shall be capable of withstanding the pressures resulting from an internal explosion of specified gases, and contain such an explosion sufficiently that an explosive gas-air mixture existing in the atmosphere surrounding the enclosure will not be ignited. Enclosed heat generating devices shall not cause external surfaces to reach temperatures capable of igniting explosive gas-air mixtures in the surrounding atmosphere. Enclosures shall meet explosion, hydro-static, and temperature design tests.

NEMA 9 – Enclosures are intended for indoor use in locations classified as Class II, Groups E, F, or G, and shall be capable of preventing the entrance of dust. Enclosed heat generating devices shall not cause external surfaces to reach temperatures capable of igniting or discoloring dust on the enclosure or igniting dust-air mixtures in the surrounding atmosphere. Enclosures shall meet dust penetration and temperature design tests, and aging of gaskets (if used).

NEMA 12 – Enclosures constructed (without knockouts) for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against circulating dust, lint, fibers, and flyings; and against dripping and light splashing of liquids.

NEMA 12K – Same as NEMA 12 including enclosures constructed with knockouts.

NEMA 13 – Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against circulating dust, lint, fibers, and flyings; and against the spraying, splashing, and seepage of water, oil, and non-corrosive coolants.