



Thank you again for sparing your time for the newsletter ! I hope these newsletters are useful. In the last edition we had provided some information on definition & classification of IP (Ingress Protection) codes.

In this edition we are covering NEMA enclosure classifications and its comparison with IEC Enclosure Types.

**NEMA Ratings**

The National Electrical Manufacturer Association (NEMA) uses a standard rating system that defines the types of environments in which an electrical enclosure can be used, and frequently signifies a fixed enclosure's ability to withstand certain environmental conditions

NEMA enclosure classifications are developed by NEMA and widely used in the U.S./American market. Ingress Protection - IP - ratings are developed by the European Committee for Electro Technical Standardization (CENELEC) (described IEC/EN 60529), and specifies the environmental protection and enclosure provided.

The table below can be used to compare from NEMA Enclosure Types to IEC Enclosure Types:

NEMA Rating	IP Equivalent	NEMA Definition	IP Definition	
1	IP10	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	1 = Protected against solid foreign objects of 50mm in diameter and greater	0 = Not Protected
2	IP11	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, and to provide a degree of protection against dripping and light splashing of liquids	1 = Protected against solid foreign objects of 50mm in diameter and greater	1 = Protected against vertically falling water drops
3	IP54	Enclosures constructed for either indoor or outdoor used 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 undamaged by external formation of ice on the enclosure	5 = Protected against dust - Limited to ingress (no harmful deposit)	4 = Protected against water sprayed from all directions - Limited to ingress permitted.



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NEMA Rating	IP Equivalent	NEMA Definition	IP Definition	
3R	IP14	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, and snow; and that will be undamaged by external formation of ice on the enclosure	1 = Protected against vertically falling water drops	4 = Protected against water sprayed from all directions - Limited to ingress permitted.
3S	IP54	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.	5 = Protected against dust - Limited to ingress (no harmful deposit)	4 = Protected against water sprayed from all directions - Limited to ingress permitted.
4	IP66	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	6 = Totally protected against dust	6 = Protected against strong jets of water from all directions - Limited to ingress permitted.
4X	IP66	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, hose-directed water, and corrosion; and that will be undamaged by the external formation of ice on the enclosure	6 = Totally protected against dust	6 = Protected against strong jets of water from all directions - Limited to ingress permitted.
5	IP52	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.	5 = Protected against dust - Limited to ingress (no harmful deposit)	2 = Protected against direct sprays of water up to 15° from the vertical.



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NEMA Rating	IP Equivalent	NEMA Definition	IP Definition	
6	IP67	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.	6 = Totally protected against dust	7 = Protected against the effects of temporary immersion between 15cm and 1m. Duration of test 30 minutes.
6P	IP67	Enclosures constructed for either indoor or outdoor use to provide a degree of protection to the 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 prolonged submersion at a limited depth; and that will be undamaged by the external formation of ice on the enclosure	6 = Totally protected against dust	7 = Protected against the effects of temporary immersion between 15cm and 1m. Duration of test 30 minutes.
12 and 12K	IP52	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 flying; and against dripping and light splashing of liquids	5 = Protected against dust - Limited to ingress (no harmful deposit)	2 = Protected against direct sprays of water up to 15° from the vertical.
13	IP54	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 noncorrosive coolants.	5 = Protected against dust - Limited to ingress (no harmful deposit)	4 = Protected against water sprayed from all directions - Limited to ingress permitted.



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