

## NEMA & IP TYPE ENCLOSURES

The NEMA rating system is predominantly used in the US and other parts of North America for rating enclosures. The table below describes each of the NEMA ratings and associates them with the equivalent IP rating. NEMA standards either meet or exceed the IP rating listed, but the reverse cannot be assumed.

The following table is based on NEMA 250-2003, IEC 60529 and the NEMA Standard Publication "A Brief Comparison of NEMA 250-Enclosures for Electrical Equipment (1000 Volts Maximum) and IEC 60529--Degrees of Protection Provided by Enclosures (IP Code).

NEMA Number	Intended use and description	Equip IP Rating
1	Indoor use primarily to provide a degree of protection against contact with the enclosed equipment and against a limited amount of falling dirt.	IP 20
2	Indoor use to provide a degree of protection against limited amounts of falling water and dirt.	IP 22
3	Outdoor use to provide a degree of protection against falling dirt, windblown dust, rain, and sleet; undamaged by the formation of ice on the enclosure.	IP 55
3R	Outdoor use to provide a degree of protection against falling dirt, rain and sleet; undamaged by the formation of ice on the enclosure.	IP 24
3S	Outdoor use to provide a degree of protection against falling dirt, windblown dust, rain, and sleet; external mechanisms remain operable while ice laden.	IP 55
4	Indoor or outdoor use to provide a degree of protection against splashing water, windblown dust and rain, and hose-directed water; undamaged by the formation of ice on the enclosure.	IP 66
4X	Indoor or outdoor use to provide a degree of protection against splashing water, windblown dust and rain, and hose-directed water; undamaged by the formation of ice on the enclosure; resists corrosion.	IP 66
6	Indoor or outdoor use to provide a degree of protection against the entry of water during temporary submersion at a limited depth; undamaged by the formation of ice on the enclosure.	IP 67
6P	Indoor or outdoor use to provide a degree of protection against the entry of water during prolonged submersion at a limited depth.	IP 68
12,12K	Indoor use to provide a degree of protection against ingress of falling dirt, circulating dust, lint, fibers and flyings and harmful effects on equipment due to dripping and light splashing of water. (12 without knockouts/ 12 K with knockouts).	IP 54
13	Indoor use to provide a degree of protection against ingress of falling dirt, circulating dust, lint, fibers and flyings, spraying, splashing and seepage of oil and non-corrosive coolants, and provide a degree pf protection with respect to harmful effects on equipment due to dripping and light splashing of water. .	IP 54

The IP Rating system (or International Protection Code) is a worldwide standard for rating enclosures. The rating is written as IP-"XY" where X and Y are replaced by the first and second digits as listed in the tables below.

Degree of protection from contact or foreign body		Degree of water protection	
1st Digit	Brief Description	2nd Digit	Brief Description
0, 1, 2	No special protection. Generally not used for pressure or temperature instruments.	0	No special protection. Generally not used for pressure or temperature instruments
3	Protected against solid objects $\geq 2.5$ mm in diameter	1	Protected against dripping water
4	Protected against solid objects $\geq 1.0$ mm in diameter	2	Protection against dropping water when case is tilted up to 15°
5	Dust protected	3	Protected against spraying water
6	Dust tight	4	Protected against splashing water
		5	Protected against a water jet
		6	Protected against heavy jet spray
		7	Protected against limited submersion
		8	Protected against continuous submersion