

NEMA Ratings vs. IP Ratings
For Outdoor Enclosures

There are two standards for measuring the protective ability of outdoor enclosures that are used in video security, NEMA ratings and IP Ratings. NEMA ratings were developed by The National Electrical Manufacturers Association in the US. The IP Code (or International Protection Rating, sometimes also interpreted as Ingress Protection Rating) was developed in Europe. (Ingress means enter in) There is not an exact correlation between the two standards so it would be hard to say that an IP rating is the same as a NEMA designation. IP ratings only consider protection against ingress of solid foreign objects and ingress of water. Some of the NEMA ratings also include protection against corrosion, etc. However, even though there are differences they are very similar ratings.

For example the ratings below would be very close in comparison:

European IP rating		USA NEMA Standard
IP54	=	Type 4
IP65/66	=	Type 4X

For most outdoor security camera enclosures you would typically see a Type 4 or Type 4X NEMA rating or an IP66 or IP68 rating.

More detailed information can be obtained from NEMA 250 publication and the IEC Publication 60529.
NEMA 250 - "Enclosures for Electrical Equipment (1000 Volts Maximum)"
IEC 60529 - "Degrees of Protection Provided By Enclosures (IP Code)"

IP (Ingress Protection) Ratings

The First digit indicates the level of protection that the enclosure provides against access to hazardous parts (e.g., electrical conductors, moving parts) and the ingress of solid foreign objects.
Second digit indicates the level of protection of the equipment inside the enclosure against harmful ingress of water.

First Digit	Protection from solid objects	Second Digit	Protection from moisture
0	No Protection	0	No Protection
1	Protection against objects >50mm	1	Protection against vertically dripping water
2	Protection against objects >12.5mm	2	Protection against spraying water ± 15° from vertical
3	Protection against objects >2.5mm	3	Protection against spraying water ± 60° from vertical
4	Protection against objects >1.0mm	4	Protection against spraying water ± 90° from vertical
5	Dust Protected (limited ingress)	5	Protection against low pressure jetting water
6	Dust Tight Protection	6	Protection against high pressure jetting water
7	N/A	7	Protection against temporary immersion (15cm and 1m)
8	N/A	8	Protection against continuous immersion under pressure

NEMA Ratings

NEMA 4 - The Type 4 enclosures are predominantly intended for indoor or outdoor use primarily to provide a degree of protection against wind borne dust and rain, splashing water and hose-directed water and to be undamaged by the formation of ice on the enclosure. They are not intended to provide protection against conditions such as internal condensation or internal icing.

NEMA 4X - The Type 4X enclosures are intended for indoor and outdoor use. Providing a degree of protection against corrosion, wind borne dust and rain, splashing water, and hose-directed water; and to be undamaged by the formation of ice on the enclosure. they are not intended to provide protection against conditions such as internal condensation or internal icing.

Comparison of Specific Applications of Enclosures for Outdoor Nonhazardous Locations

Provides a Degree of Protection Against the Following Environmental Conditions	3	3R*	3S	4	4X	6	6P
Incidental contact with the enclosed equipment	X	X	X	X	X	X	X
Rain, snow, and sleet **	X	X	X	X	X	X	X
Sleet ***	...	...	X	...	...	...	...
Windblown dust, lint, fibers, and flyings	X	...	X	X	X	X	X
Hose down	...	...	...	X	X	X	X
Corrosive agents	...	...	...	...	X	...	X
Occasional temporary submersion	...	...	...	...	...	X	X
Occasional prolonged submersion	...	...	...	...	...	...	X

* These enclosures may be ventilated.

** External operating mechanisms are not required to be operable when the enclosure is ice covered.

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