



NEMA ENCLOSURE TYPES*	
ENCLOSURE RATING	NEMA National Electrical Manufacturers Association (NEMA Standard 250) and Electrical and Electronic Manufacturer Association of Canada (EEMAC)
Type 1	Enclosure intended for indoor use primarily to provide a degree of protection against contact with the enclosed equipment or locations where unusual service conditions do not exist
Type 2	Enclosure intended for indoor use primarily to provide a degree of protection against limited amounts of falling water and dirt
Type 3	Enclosure intended for outdoor use primarily to provide a degree of protection against windblown dust, rain, and sleet; undamaged by the formation of ice
Type 3R	Enclosure intended for outdoor use primarily to provide a degree of protection against falling rain and sleet; undamaged by the formation of ice
Type 3S	Enclosure intended for indoor/outdoor use primarily to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, and in which the external mechanisms remain operable when ice laden
Type 4	Enclosure intended for indoor/outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, and hose-directed water; undamaged by the formation of ice
Type 4X	Enclosure intended for indoor/outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose-directed water; undamaged by the formation of ice
Type 6	Enclosure intended for indoor/outdoor use where occasional submersion is encountered in limited depth; undamaged by the formation of ice
Type 12	Enclosure intended for indoor use primarily to provide a degree of protection against dust, falling dirt, and dripping noncorrosive liquids
Type 13	Enclosure intended for indoor use primarily to provide a degree of protection against dust, spraying of water, oil, and noncorrosive coolant

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* See page 517-521 for enclosure types for hazardous locations.



ENCLOSURES

ENCLOSURE SELECTION CHART

NEMA/IP RATINGS

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ENCLOSURES

Example Rating

If 1st IP number is	and the 2nd IP number is	then the IP rating is
2	3	IP 2 3
Protection against solid objects	Protection against liquids	Enclosure protection against penetration of solid objects greater than 12 mm and against spraying water

FIRST NUMERAL		SECOND NUMERAL	
IP	Test	IP	Test
0	No protection	0	No protection
1	Protection against solid objects over 50 mm (i.e., accidental touch by hands)	1	Protection against vertically falling drops of water (i.e., condensation)
2	Protection against solid objects over 12 mm (i.e., fingers)	2	Protection against direct sprays of water up to 15 degrees from vertical
3	Protection against solid objects over 2.5 mm (i.e., tools and wires)	3	Protection against sprays up to 60 degrees from vertical
4	Protections against solid objects over 1 mm	4	Protection against water sprayed from all directions (limited ingress permitted)
5	Protection against dust (limited ingress, no harmful deposit)	5	Protection against low pressure jets of water from all directions (limited ingress permitted)
6	Total protection against dust	6	Protection against strong jets of water
		7	Protection against the effects of immersion between 15 cm and 1m
		8	Protection against long periods of immersion under pressure

CROSS-REFERENCE (approximate) NEMA, UL, CSA vs IEC Enclosure Type (cannot be used to convert IEC classifications to NEMA Type numbers)

ENCLOSURE RATING	IP20	IP22	IP54	IP55	IP64	IP65	IP66	IP67
Type 1	•							
Type 3					•			
Type 3R		•						
Type 3S					•			
Type 4			•	•			•	
Type 4X							•	
Type 6								•
Type 12				•				
Type 13						•		

IEC 60529 has no equivalents to NEMA Enclosure Types 7, 8, 9, 10, or 11.

• Indicates compliance

Enclosure Type Rating vs IP Rating

Electrical enclosures are rated by type (NEMA 250/UL 50) and/or (IEC 60529) based on the degree of protection provided.

Type ratings and IP ratings have only the following in common:

1. A degree of protection for persons from hazardous components inside the enclosure
2. A degree of protection for equipment inside the enclosure from ingress of solid foreign objects, including dust
3. A degree of protection for equipment inside the enclosure from ingress of water

NEMA 250 and UL 50 type rating documentation defines additional requirements that type-rated enclosures must meet. These include the following:

- Mechanical impact on enclosure walls
- Gasket aging and oil resistance
- Corrosion resistance
- Door and cover requirements
- Sheet metal gauge construction requirements

Note: Electrical enclosures that carry an IP rating only have not been designed to the additional type-rating requirements; therefore, a type-rating cannot be assigned to an enclosure that has been only IP rated. Electrical enclosures manufactured by Hoffman are tested for both Type rating and IP rating and carry both Type and IP ratings.

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