



A.6 IP Code and NEMA Type

Degree of Protection Provided by Enclosures (IP Code)

Enclosures of electrical equipment which are installed in process areas or work places whether indoors or outdoors shall often come into contact with dust, dirt, water, as well as the other environmental influences. With the objectives to protect the persons against the hazardous parts inside the enclosure, protect the equipment inside the enclosure against the ingress of solid foreign object and the ingress of water, the enclosure body shall be tested according to requirements of IEC 60529 or EN 60529 for specific design of the IP code. This code is shown as IPxx by the first numeral is protection against solid foreign matter and the second numeral is protection against water.

Degree of protection according to IEC 60529

First Numeral	Protection against ingress of solid foreign object
0	Non-protected
1	Solid object dia. \geq 50 mm
2	Solid object dia. \geq 12.5 mm
3	Solid object dia. \geq 2.5 mm
4	Solid object dia. \geq 1.0 mm
5	Dust-protected
6	Dust-tight (No ingress of dust)

Second Numeral	Protection against ingress of water
0	Non-protected
1	Vertically dripping
2	Water drop when enclosure tilted up to 15°C
3	Water spraying
4	Water splashing
5	Water jetting
6	Powerful water jetting
7	Temporary immersion in water
8	Continuous immersion in water

NEMA Type Enclosures for Electrical Equipment (1000 Volts Maximum)

Enclosures for electrical equipment rated not more than 1000 Volts which intended to be installed within Hazardous or Non-hazardous locations shall be specified by NEMA Type if they are provided according to the American National Standards. The NEMA standard publication, NEMA 250, developed by National Electrical Manufacturers Association (NEMA) is widely used by the electrical industry to provided guidelines for manufacture and proper application of enclosures within USA and other countries. For more information, see <http://www.nema.org>.

Conversion of NEMA Enclosure Type Ratings to IEC 60529 Enclosure Classification Designation (IP)

(Cannot be used to convert IEC Classification Designation to NEMA Type ratings)

IP First Character	NEMA Enclosure Type												IP Second Character		
	1	2	3, 3X, 3S, 3SX	3R, 3RX	4, 4X	5	6	6P	12, 12K, 13						
IP0_														IP_0	
IP1_														IP_1	
IP2_														IP_2	
IP3_														IP_3	
IP4_														IP_4	
IP5_														IP_5	
IP6_														IP_6	
														IP_7	
														IP_8	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	

A = A shaded block in the "A" column indicates that the NEMA Enclosure Type exceeds the requirements for the respective IEC 60529, IP First Character Designation. The IP First Character Designation is the protection against access to hazardous parts and solid foreign objects.

B = A shaded block in the "B" column indicates that the NEMA Enclosure Type exceeds the requirements for the respective IEC 60529, IP Second Character Designation. The IP Second Character Designation is the protection against the ingress of water.

Ref: NEMA250:2003