COOPER Wheelock

IP Ratings Fact Sheet

What are IP ratings?

IP is an abbreviation for Ingress Protection. It is a standard for electrical enclosures. The ratings refer to the equipments ability to allow solids and liquids into its enclosure. The IEC (International Electrotechnical Commission) defines these under standard 60529.

The ratings are always displayed as two numbers. The first number refers to the protection against solids and the second number is protection against liquids.

How does this differ from NEMA ratings?

NEMA (National Electrical Manufacturers Association) also considers other items such as corrosions, rust and construction details. Because of this, it is possible to say a NEMA Type is similar to an IP rating, but the inverse is not possible. It is not possible to state an IP rating is similar to a NEMA Type.

What do the numbers represent?

2 digits are used to denote the level of ingress protection that a piece of apparatus enjoys:

IP □ □

	Solids		Liquids
0	No protection	0	No protection
1	Protected against solid objects up to 50mm, e.g. hands	1	Protected against vertically falling drops of water
2	Protected against solid objects up to 12mm, e.g. fingers	2	Protected against water spray up to 15 degrees from vertical
3	Protected against solid objects up to 2.5mm, e.g. tools	3	Protected against water spray up to 60 degrees from vertical
4	Protected against solid objects up to 1mm, e.g. wires	4	Protected against water sprays from all directions
5	Protected against dust. (No harmful deposits)	5	Protected against water jets from all directions
6	Totally protected against dust	6	Protected against strong water jets from all directions
		7	Protected against immersion between 15cm and 1m in depth
		8	Protected against ling immersion under pressure

Is it truly an international standard?

Most countries outside Europe or North America use the IEC Standards as a basis for their own national standards. The Russian Federation certifies equipment to GOST 'R' standards, these closely follow CENELEC practice.

There is a scheme in place which will when fully adopted allow for internationally recognized certification to become a reality, this is the IEC EX SCHEME. This uses the IEC standards and IEC recognized test and certification bodies to issue mutually recognized test reports and certificates. The scheme is in its infancy and its level of success cannot yet be measured.

North American practice is to use NEMA standards to describe ingress protection:

NEMA 3 is similar to IP 54
NEMA 4 is similar to IP 55
NEMA 4x is similar to IP 56
NEMA 6 is similar to IP 67

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Hazardous Environment Classification Chart