

Ingress Protection of Enclosures (IP and NEMA)

INGRESS PROTECTION (IP)

What is IP and what does it mean?

The acronym IP means many things in different contexts. To some it is Internet Protocol, to others it is Intellectual Property. But in this document, IP refers to Ingress Protection, meaning protection from the environment.

IP is defined under an international classification, IEC 60529, and characterizes levels of protection for electrical enclosures. The protection can be from fingers, dust or water. The standard classification designation is 'IP' followed by two numbers which designate the level of protection.



The C-Splash-2 is rated IP-68

The first digit of the number designates protection from solid objects and the second digit designates protection from moisture. The levels for the first digit vary from 1 through 6 and the second digit 1 through 8 where a larger number means increased protection. The table below summarizes the various IP designations. As you can see, the greatest level of protection is IP68, which is for continuously submerged enclosures.

	First Digit Protection from solid objects	Second Digit Protection from moisture
0	No Protection	No Protection
1	Protection against objects >50mm	Protection against vertically dripping water
2	Protection against objects >12.5mm	Protection against water when tilted +/- 15 deg
3	Protection against objects >2.5mm	Protection against spraying water
4	Protection against objects >1.0mm	Protection against splashing water
5	Dust Protected	Protection against jetting water
6	Dust Tight	Protection against heavy jetting water
7	N/A	Protection against temporary immersion
8	N/A	Protection against continuous immersion

If there is only one class of protection, you may see an 'X' designation in place of one of the digits.

The IP designation is similar to various forms of NEMA enclosure protection. Many designers and contractors are familiar with NEMA type 4 enclosures for example which is approximately equivalent to IP55. Other near equivalent NEMA and IP ratings are shown in the following table:

NEMA Designation	IP
1	10
2	11
3	54
3R	14
3S	54
4 and 4X	55
5	52
6 & 6P	67
12 & 12K	52
13	54