

IP rating also known as Ingress Protection or International Protection ratings are defined in the EN 60529 standard. It defines the levels of sealing effectiveness for equipment against intrusion from dirt and moisture.

What do the numbers in an IP Rating mean?

Ratings consists of the letters IP followed by two numbers, the higher the number the better the protection. Sometimes a number is replaced by X which means the equipment is not rated for that specification. An X in the code may also denote that a rating has only been provided for one of the two ingress types (solids intrusion or moisture), but not for the other.

First Number – Solids:

The first number is the level of protection that the equipment provides against the ingress of solid foreign objects e.g. tools, fingers or airborne dust that may be hazardous if in contact with internal conductors or moving parts.

Second Number – Liquids:

The second number is the level of protection inside the equipment against various forms of moisture (e.g. drips, spray or submersion).

1st Number	Solids Intrusion Protection	2nd Number	Moisture Intrusion Protection
0 or X	No protection/Not rated/No rating supplied.	0 or X	No protection/Not rated/No rating supplied.
1	Protection from solid objects over 50mm dia. e.g. hand.	1	Protection from vertically falling drops of water e.g. condensation. No damage or interrupted functioning of equipment when upright.
2	Protection from solid objects over 12mm dia e.g. finger.	2	Protection from dripping water up to 15 degrees from the vertical.
3	Protection from solid objects over 2.5mm dia e.g. tools & wires.	3	Protection from direct sprays of water up to 60 degrees from the vertical.
4	Protection from solid objects over 1mm dia e.g. wires, screws, nails and larger insects.	4	Protection from water splashed from any direction. Tested for a minimum of 10 minutes with an oscillating spray. Limited ingress permitted with no harmful effects.
5	Partial protection from dust ingress, no harmful deposits.	5	Protection from low pressure jets (6.3mm) of directed water from all angles. Limited ingress permitted with no harmful effects.
6	Total protection from dust & other particulates, including a vacuum seal, tested against continuous airflow.	6	Protection from high pressure jets of water (12.5mm nozzle). Limited ingress permitted with no harmful effects.
		7	Protection against full water immersion for up to 30minutes at depths of between 15cm – 1Mtr. Limited ingress permitted with no harmful effects
		8	Protection against extended immersion under higher pressure (e.g. greater depths). Parameters will be specified by the manufacturer and may include additional factors e.g. flow rates, temperature etc.
		9k	Protection from high pressure, high temperature jet sprays, steam cleaning, wash-downs. Rating typically used for road vehicles.

Example:

IP56 provides partial protection from dust ingress, no harmful deposits with protection from high pressure jets of water, (12.5mm nozzle). Limited ingress permitted with no harmful effects.