

Ingress Protection

Definition of the degrees of protection according to EN 60529 - Ingress Protection

These levels of protection are indicated by a code made up of two constant letters, "IP", and two characteristic numbers that indicate the degree of protection, e.g. IP54. The IP rating indicates the degree of protection against contact/access, and the ingress of solid and liquid foreign bodies.

Contact and Ingress of Solids		
First characteristic numeral	Designation	Scope of protection
0	Non-protected	No special protection for persons against direct contact with live or moving parts. No protection of the equipment against ingress of solid foreign objects.
1	Protection against large foreign bodies	Protection against accidental contact of large areas with live and internal moving parts, e.g. back of hand, but no protection against deliberate access to the parts. Protection against ingress of solid foreign objects with a diameter greater than 50 mm.
2	Protection against medium-sized foreign bodies	Protection against contact between the finger and live or internal moving parts. Protection against ingress of solid foreign objects with a diameter greater than 12.5 mm.
3	Protection against small foreign bodies	Protection against contact between live or internal moving parts and tools, wires and the like with a thickness greater than 2.5 mm. Protection against ingress of solid foreign objects with a diameter greater than 2.5 mm.
4	Protection against granular foreign objects	Protection against contact between live or internal moving parts and tools, wires and the like with a thickness greater than 1 mm. Protection against ingress of solid foreign objects with a diameter greater than 1 mm.
5	Protection against dust deposits	Complete protection against contact with live or internal moving parts; protection against hazardous dust deposits. The ingress of dust is not completely prevented, but dust may not penetrate in such quantities as to impair the function.
6	Protection against dust entry	Complete protection against contact with live or internal moving parts. Protection against the ingress of dust.

Ingress of Liquids		
Second characteristic numeral	Designation	Scope of protection
0	Non-protected	No special protection.
1	Protection against vertically dripping water	Water dripping vertically must cause no damage.
2	Protection against dripping water (tilted)	Water dripping at an angle of 15° to the vertical from any direction must cause no damage.
3	Protection against spraying water	Water dripping at an angle of 60° to the vertical from any direction must cause no damage.
4	Protection against splashing water	Water that splashes against the equipment from any direction must cause no damage.
5	Protection against water jets	A water jet from a nozzle that is directed against the equipment from any direction must cause no damage.
6	Protection against flooding	Water must not penetrate the equipment in hazardous quantities in cases of temporary flooding, e.g. due to heavy seas.
7	Protection during temporary immersion	Water must not penetrate the equipment in hazardous quantities if the equipment is immersed in water under the specified conditions of pressure and time (1m for 30 min.).
8	Protection during continuous immersion	Water must not penetrate the equipment in hazardous quantities if the equipment is immersed in water (at least 2 bar for 2 h).
9k	Protection against high pressure/ steam jet cleaning	Highly pressurized water directed at the enclosure from any direction must cause no damage.

Example:

Code IP65

- First digit: Protection against contact and ingress of solid foreign objects.
- Second digit: Protection against ingress of liquids.