

Degrees of Protection | IP: International Protection

For reasons of safety, connectors must be protected against environmental influences, e.g. dust, foreign bodies, touch, humidity and water. In case of industrial connectors, this protection must be provided for by the housing and its locking as well as the insulation on cable outlet.

The degrees of protection are indicated by an abbreviation consisting of two constant characteristic letters IP (International Protection) and two following digits for the protection degree. The first digit indicates the protection degree against touch and foreign bodies. The second digit indicates the protection against damaging ingress of water. All data are only valid in locked condition. Awarding degrees of protection is subject to a standardised testing procedure.



Protection against touch and foreign bodies.



0 Unprotected



1 Protected against access to dangerous parts by hand pressure. Protected against solid foreign bodies Ø50mm.



2 Protected against access to dangerous parts by fingers. Protected against solid foreign bodies Ø12.5mm.



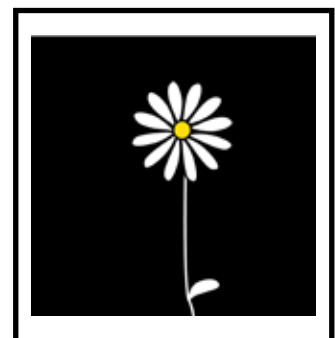
3 Protected against access to dangerous parts by a tool. Protected solid foreign bodies Ø2.5mm.



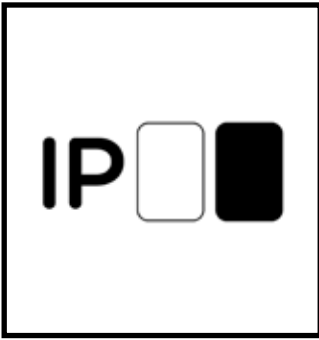
4 Protected against access to dangerous parts by a wire. Protected against solid foreign bodies Ø1mm.



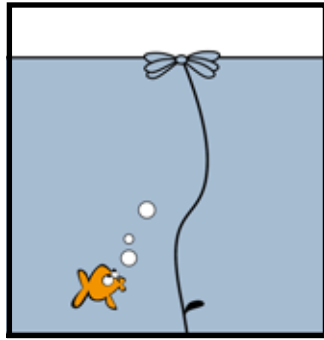
5 Protected against access to dangerous parts by a wire. Protected against dust.



6 Protected against access to dangerous parts by wire. Protected against dust.



Protection against damaging ingress of water.



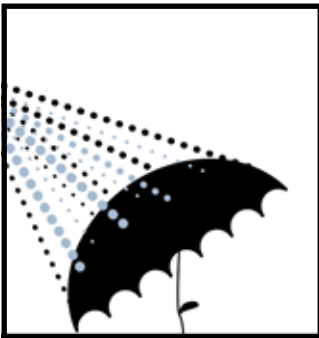
0 Unprotected



1 Protected against vertically falling dripping water.



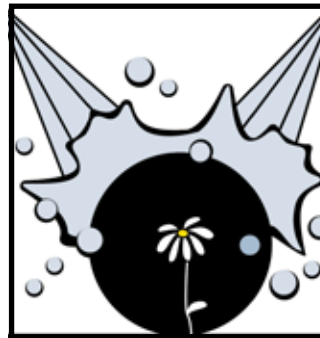
2 Protected against dripping water when housing is inclined up to 15°



3 Protected against sprinkling water up to 60° against the vertical.



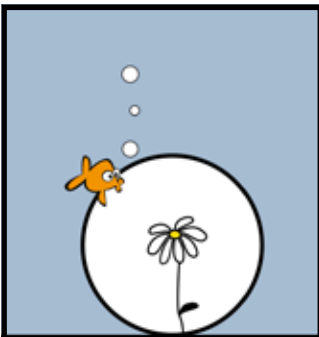
4 Protected against water-jet from all directions



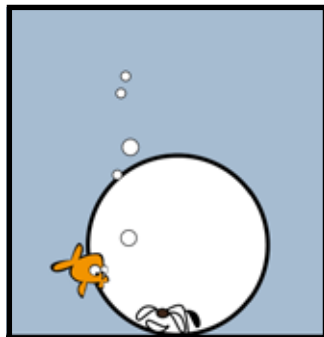
5 Protected against water-jet from any angle



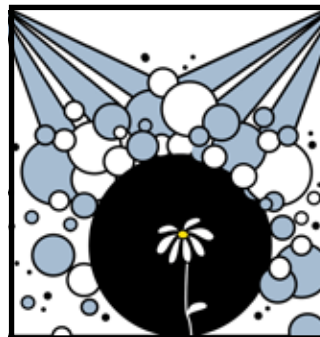
6 Protected against a strong water-jet



7 Protected against effects due to temporary immersion in water (up to 1 meter depth for 30 minutes).



8 Protected against effects due to permanent immersion in water (duration and depth by arrangement but longer/deeper than IP_7)



9 Protected against water by high-pressure steam-jet cleaning

Higher is better?

Up to IP_6, all lower protection classes are automatically included. Beyond that, this is not the case. However, IP_8 automatically includes IP_7, as the specification requires longer and/or deeper immersion.

Difference between IP69 and IP69k

Although both protection classes refer to protection by enclosure, they differ in the area of application of the devices concerned. IP69k was introduced in 1993 and takes into account the special requirements for electrical or electronic equipment in very robust and mobile outdoor applications such as road vehicles or agricultural machinery. It is regulated in the ISO 20653:2013 standard.

IP69 refers to the dust and water resistance of general electrical equipment, which also includes industrial PCs for various industries or medical technology. The high level of protection can also be achieved for panel PCs with an integrated capacitive touchscreen. The criteria are defined in the DIN EN 60529 standard.