IP Ratings

IP (or "Ingress Protection") ratings are defined in international standard IEC 60509 (British BS EN 60529, European EN 60509). They are used to define levels of sealing effectiveness against intrusion from foreign bodies (tools, dirt etc) and moisture.

The first digit is the degrees of protection against solid foreign objects.

The second digit is protection from moisture ingress.

Example: IP 67 (dust tight, protected against the effects of temporary immersion in water).

Protection against Dust

First characteristic numeral	Degree of protection	
	Brief description	Definition
0	Non-protected	-
1	Protected against solid foreign objects of 50 mm Ø and greater	The object probe, sphere of 50 mm Ø shall not fully penetrate*
2	Protected against solid foreign objects of 12.5 mm Ø and greater	The object probe, sphere of 12.5 mm Ø shall not fully penetrate*
3	Protected against solid foreign objects of 2.5 mm Ø and greater	The object probe, sphere of 2.5 mm Ø shall not fully penetrate*
4	Protected against solid foreign objects of 1.0 mm Ø and greater	The object probe, sphere of 1.0 mm Ø shall not fully penetrate*
5	Dust-protected	Ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the apparatus or to impair safety
6	Dust-tight	No ingress of dust

*The full diameter of the object probe shall not pass through an opening of the enclosure.

Revised: VL 02/03/26

Protection against Water

Second characteristic numeral	Degree of protection	
	Brief description	Definition
0	Non-protected	-
1	Protected against vertically falling water drops	Vertically falling water drops shall have no harmful effects
2	Protected against vertically falling water drops when enclosure tilted up to 15°	Vertically falling water drops shall have no harmful effects when the enclosure is tilted up to 15° on either side of the vertical
3	Protected against spraying water	Water sprayed at an angle up to 60° on either side of the vertical shall have no harmful effects
4	Protected against splashing water	Water splashed against the enclosure from any direction shall have no harmful effects
5	Protected against water jets	Water projected in jets against the enclosure from any direction shall have no harmful effects
6	Protected against powerful water jets	Water projected in powerful jets against the enclosure from any direction shall have no harmful effects
7	Protected against the effects of temporary immersion in water	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed in water under standardized conditions of pressure and time
8	Protected against the effects of continous immersion in water	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is continuously immersed in water under conditions which shall be agreed between manufacturer and user but which are more severe than for numeral 7