



IP (Ingress Protection) Codes

Degrees of Protection Provided by Enclosures

This Standard describes a system for classifying the degrees of protection provided by the enclosures of electrical equipment. Developed by the European Committee for Electrotechnical Standardization (CENELEC), these standards are designed to numerically rate an electrical product on the level of protection its enclosure provides. By assigning different number codes, the product's degree of protection can be identified quickly and easily. In the code IP 54, for example, IP identifies this standard, the "5" describes the level of protection from solid objects, and the "4" describes the level of protection from liquids.

First Characteristic Numeral	DEGREE OF PROTECTION (First Number in Code)	
	Brief Description	Definition
0	Not protected	—
1	Protected against solid foreign objects of 50mm diameter and greater.	The object probe, sphere of 50mm diameter, shall not fully penetrate. ¹
2	Protected against solid foreign objects of 12.5mm diameter and greater.	The object probe, sphere of 12.5mm diameter, shall not fully penetrate. ¹
3	Protected against solid foreign objects of 2.5mm diameter and greater.	The object probe, sphere of 2.5mm diameter, shall not penetrate at all. ¹
4	Protected against solid foreign objects of 1mm diameter and greater.	The object probe, sphere of 1mm diameter, shall not penetrate at all. ¹
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.

¹ The full diameter of the object shall not pass through an opening of the enclosure

Second Characteristic Numeral	DEGREE OF PROTECTION (Second Number in Code)	
	Brief Description	Definition
0	Not protected	—
1	Protected against vertically falling water drops.	Vertically falling drops shall have no harmful effects.
2	Protected against vertically falling water drops when enclosure is tilted up to 15°.	Vertically falling drops have no harmful effects when the enclosure is tilted at any angle up to 15° on either side of the vertical.
3	Protected against spraying water.	Water sprayed at an angle up to 60° degrees 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 1 meter in water under standardized conditions of pressure and time.
8	Protected against the effects of continuous 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 the user, but are more severe than for number 7.

