

IP Classification Codes

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Basis of IP Rating System

International Standard IEC 60529 outlines an international classification system that describes the sealing characteristics of electrical equipment. The classification system defines the level of protection provided by enclosures to prevent the ingress of foreign objects and moisture into the electrical equipment. The classification system uses the “IP” code, or “Ingress Protection” code, to define the level of seal. The IP code uses a system of two numerical digits to define the level of both foreign object and moisture protection. Although the IP classification is primarily used for establishing the level of seal in electrical equipment, it is adapted herein for determining the level of seal in passive electrical components.

Degrees of Protection (Foreign Bodies) – 1st Digit

The first digit of the IP code indicates the degree of protection against solid foreign objects from entering the electrical device. The table below outlines the level of protection against foreign objects for each level.

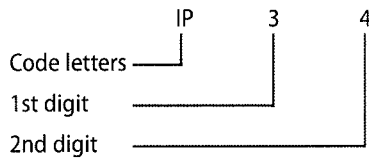
<i>IP Level 1st Digit</i>	<i>Description of Protection Level</i>
0	<i>Not protected</i>
1	<i>Protected against solid foreign objects of 50 mm diameter and greater</i>
2	<i>Protected against solid foreign objects of 12,5 mm diameter and greater</i>
3	<i>Protected against solid foreign objects of 2,5 mm diameter and greater</i>
4	<i>Protected against solid foreign objects of 1,0 mm diameter and greater</i>
5	<i>Protected from the amount of dust that would interfere with normal operation</i>
6	<i>Dust tight</i>

Degrees of Protection (Moisture) – 2nd Digit

The second digit of the IP code indicates the degree of protection against the ingress of various forms of moisture (e.g. drip, spray, submersion, etc.) into the component. Tests to determine the level of protection are carried out with fresh water and do not take into account the use of solvents.

<i>IP Level 2nd Digit</i>	<i>Description of Protection Level</i>
0	<i>Not protected</i>
1	<i>Protected against vertically falling water drops</i>
2	<i>Protected against vertically falling water drops when enclosure is tilted up to 15°</i>
3	<i>Protected against water sprayed at an angle up to 60° on either side of the vertical</i>
4	<i>Protected against water splashed against the component from any direction</i>
5	<i>Protected against water projected in jets from any direction</i>
6	<i>Protected against water projected in powerful jets from any direction</i>
7	<i>Protected against temporary immersion in water</i>
8	<i>Protected against continuous immersion in water, or as specified by the user</i>















Example of an IP Code



A component with this IP code indicates that a component is protected against ingress of solid foreign objects having a diameter of 2,5 mm and greater; and is protected against harmful effects due to water splashed against the component from any direction.

IP Code Symbols

This chart is based on an internationally recognized set of symbols that graphically represent the IP classification system. These symbols are sometimes used instead of the IP code to illustrate the level of protection.

1st Digit	Foreign Object Protection	2nd Digit	Water Protection
0	Not protected	0	Not protected
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
		7	
		8	



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