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Technical Notes : Hardware, IP Ratings explained

## Protection categories to EN 60 529/IEC 529



Product Support

The IP Code characterised by 2 numerals

Example of IP Code e.g IP 43

Code Letters : IP

First Numeral : 4

Second Numeral : 3

### Degrees of protection for protection against contact and foreign objects indicated by first characteristic numeral

1st numeral	Degree of Protection	
	Description	Definition
0	Non-protected	-
1	Protected against solid foreign objects with a diameter of 50mm and greater	The object probe, a sphere 50mm diameter, shall not fully penetrate.
2	Protected against solid foreign objects with a diameter of 12.5mm and greater	The object probe, a sphere 12.5mm diameter, shall not fully penetrate. The jointed test finger 12mm diameter 80mm length, shall have adequate clearance from hazardous parts.
3	Protected against solid foreign objects with a diameter of 2.5mm and greater	The object probe, a sphere 2.5mm diameter, shall not penetrate at all.
4	Protected against solid foreign objects with a diameter of 1mm and greater	The object probe, a sphere 1mm diameter, shall not penetrate at all.
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 (at a partial vacuum of 20mbar inside the enclosure).

### Degrees of protection against water indicated by second characteristic numeral

2nd numeral	Degree of Protection	
	Description	Definition
0	Non-protected	-
1	Protected vertically falling water drops	Vertically falling drops shall have no harmful effects.
2	Protected vertically	Vertically falling drops shall have no harmful

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	falling water drops when the enclosure is tilted up to 15°	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 of up to 60° on either side of the vertical shall have no harmful effects.
4	Protected against splashing water	Water splashed against the enclosure will enclosure from any direction shall have no harmful effects.
5	Protected against water jets	Water projected in jets against the enclosure will enclosure from any direction shall have no harmful effects.
6	Protected against powerful water jets	Water projected in powerful jets against the enclosure will 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 standardised 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 the manufacturer and the user but which is more severe than for numeral 7.

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