

## IP (Ingress Protection) Ratings

### IP Ratings for Electronic enclosures.

The IP rating or IP code defined in international standard IEC 60529 classifies the level of protection that electrical appliances provide against the intrusion of solid objects or dust, accidental contact, and water. The Ingress Protection (IP) rating is identified by a code that consists of the letters IP followed by two digits and an optional letter. The digits indicate conformity with the conditions summarized in the tables below. Where there is no protection rating with regard to one of the criteria, the digit is replaced with the letter X.

The First digit indicates the level of protection that the enclosure provides against access to hazardous parts and the ingress of solid foreign objects.

0.....no protection against contact and ingress of objects.

1..... 50 mm any large surface of the body, such as the back of a hand, but no protection against deliberate contact with a body part.

2.....12.5 mm fingers or similar objects.

3.....2.5 mm tools, thick wires, etc.

4.....1 mm most wires, screws, etc.

5.....dust protected ingress of dust is not entirely prevented, but it must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment; complete protection against contact .

6.....dust tight, no ingress of dust; complete protection against contact.

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The second digit indicates the level of protection of the equipment inside the enclosure against harmful ingress of water.

0.....not protected.

1.....dripping water Dripping water (vertically falling drops) shall have no harmful effect.

2 .....dripping water when tilted up to 15° Vertically dripping water shall have no harmful effect when the enclosure is tilted at an angle up to 15° from its normal position.

3.....spraying water Water falling as a spray at any angle up to 60° from the vertical shall have no harmful effect.

4.....splashing water Water splashing against the enclosure from any direction shall have no harmful effect.

5 .....water jets Water projected by a nozzle against enclosure from any direction shall have no harmful effects.

6.....powerful water jets Water projected in powerful jets against the enclosure from any direction shall have no harmful effects.

7.....immersion up to 1 m Ingress of water in harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time (up to 1 m of submersion).

8 .....immersion beyond 1 m The equipment is suitable for continuous immersion in water under conditions which shall be specified by the manufacturer.