

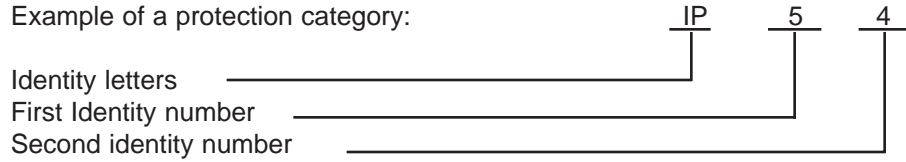
Protection category in accordance with DIN 40050 and IEC 529.

Extract from DIN 40050, sheet 7, pages 1 ...4.

DIN 40050 deals with the protection of electrical equipment by means of enclosures, covers, etc. and applies to the following:

1. Operator protection against contact of electrified or moving parts within the enclosure and protection of working parts against intrusion of foreign objects (contact and foreign object protection).
2. Protection of working parts against the entry of water (water protection).
3. Abbreviations for the internationally agreed protection categories. The protection categories are given in the form of an abbreviation, which consists of 2 constant letters IP, and 2 identity numbers.

Example of a protection category:



NEMA STANDARDS

NEMA 4/UL 4

Enclosures intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, and hose directed water.

NEMA 4X/UL 4X

Enclosures intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing wafer, and hose directed water.

NEMA 12/UL12

Enclosures intended for indoor use primarily to provide a degree of protection against dust, falling dirt, and dripping non-corrosive liquids.

NEMA 13/UL 13

Enclosures intended for indoor use primarily to provide a degree of protection against dust, spraying water, oil, and non-corrosive liquids.

Contact and foreign object protection categories

First Identity number	Protection Category (contact and foreign object protection)
0	No special protection
1	Protection against the entry of solid foreign objects, having a diameter larger than 50 mm (large foreign object) ¹ No protection against intended access, i.e. with the hand
2	Protection against the entry of solid foreign objects, having a diameter larger than 12 mm (medium sized foreign object) Protection for fingers and similar objects.
3	Protection against the entry of solid foreign objects, having a diameter larger than 2.5 mm (small foreign object) ¹⁾²⁾ Protection for tools, wires or similar objects which are thicker than 2.5 mm.
4	Protection against the entry of solid foreign objects, having a diameter larger than 1 mm (grain-type foreign object) ¹⁾²⁾ Protection for tools, wires or similar objects which are thicker than 1 mm.
5	Protection against harmful dust deposits. The entry of dust is not totally prevented but the entry of dust is not allowed in such quantities that the operation of equipment will be impaired (dust protection) ³ Complete contact protection.
6	Protection against the entry of dust (dustproof). Complete Contact protection.

1)With operating equipment, having a protection category of 1-4, entry of evenly or unevenly formed foreign objects which is larger than the corresponding diameter value is prevented.
 2) For protection categories 3 and 4, the use of this table is dependent upon the decision of the appropriate committee for operating material with drainage holes or cooling vents.
 3)For protection category 5, the use of this table is dependent upon the decision of the appropriate committee for operating materials with drainage holes.

Water protection categories.

Second Identity number	Protection Category (water protection)
0	No special Protection
1	Protection against vertically falling drip water. No harmful effects are allowed (drip water)
2	Protection against vertically falling drip water. When the enclosure is tipped up to an angle of 15° from it's normal position, there should be no harmful effects (drip water falling at an angle).
3	Protection against drip water that falls at an angle of up to 60° from the vertical. No harmful effects are allowed (atomized water)
4	Protection against water which sprays against the equipment from all directions. No harmful effects are allowed (spray water)
5	Protection against water from a hose which is directed on the enclosure from all directions. No harmful effects are allowed (hose directed water)
6	Protection against strong seas or strong water jets. Entry of water into the enclosure in harmful amounts is not allowed (overflow)
7	Protection against water when the enclosure is dipped in water under given pressure and time conditions. Entry of water onto the enclosure in harmful amounts is not allowed (submersion)
8	The enclosure is suitable for constant submersion in water under given conditions which are determined by the manufacturer.(submersion).1)

1) This protection category normally means that the operating equipment is airtight. Under certain operating conditions, however, water can enter providing it produces no harmful effects.