

# Protection index

## Protection against electric shocks

This relates to the risk of so-called indirect contact as a result of a fault in the insulation between the active parts and the earth of the load.

The EN 61140 standard (June 2002) defines the following four classes :


Class 0

- Single functional insulation, no possibility of connecting metal earths to a protective conductor (this kind of equipment is prohibited even in non hazardous zones).

Class 1

- Single functional insulation, obligatory presence of an earthing terminal for the earths.

Class 2

- Double insulation or reinforced insulation identified by two concentric squares (international symbol) 


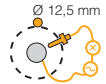
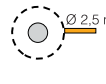

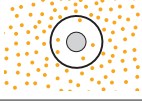
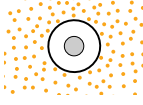
Classe 3



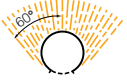

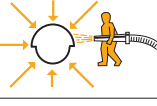
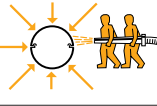
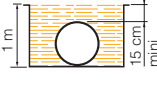
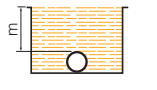
- Equipment supplied at a voltage not exceeding the limits of extra low voltage (ELV) and not having any internal or external circuits operating at a voltage above these limits.

Moreover, article 13 of the EN 50 014 standard stipulates, for all equipment for explosive atmospheres, at least one connection element for the protective conductor or the conductor for the equipotential earth connection.

NB : classes 2 and 3 do not provide any additional protection with regard to the risk of explosion.

## PROTECTION INDEXES FOR ELECTRICAL ENCLOSURES IN ACCORDANCE WITH CEI 60529 AND EN 60529 STANDARDS

| 1 <sup>st</sup> figure : protection against solid bodies |   |  |
|--|---|--|
| IP   | tests   |  |
| 0  |   | No protection  |
| 1  |    | Protected against solid bodies larger than 50 mm (eg. : accidental contacts with the hand) |
| 2  |   | Protected against solid bodies larger than 12,5 mm (eg. : finger of the hand)              |
| 3  |  | Protected against solid bodies larger than 2,5 mm (eg. : tools, wires)                     |
| 4  |  | Protected against solid bodies larger than 1 mm (eg. : fine tools, small wires)            |
| 5  |  | Protected against dust (no harmful deposit)  |
| 6  |  | Completely protected against dust  |

| 2 <sup>nd</sup> figure : protection against liquids |   |   |
|---|---|---|
| IP  | tests   |   |
| 0   |   | No protection   |
| 1   |    | Protected against vertically-falling drops of water (condensation)          |
| 2   |   | Protected against drops of water falling at up to 15° from the vertical     |
| 3   |  | Protected against drops of rainwater falling at up to 60° from the vertical |
| 4   |  | Protected against projections of water from all directions                  |
| 5   |  | Protected against jets of water from all directions                         |
| 6   |  | Completely protected against jet of water of similar force to heavy seas    |
| 7   |  | Protected against the effects of immersion                                  |
| 8   |  | Protected against effects of prolonged immersion under specified conditions |

## ELECTRICAL CLASSES

| Class     | Protection   |
|-----------|--|
| Class 0   | Insulation by construction without connection to earth |
| Class I   | Insulation by construction with connection to earth    |
| Class II  | Double insulation without connection to earth          |
| Class III | Adapted to extra low voltage (< 50V)                   |

*The electrical class defines the protection of people against indirect electrical contacts.*

## Protection against mechanical shocks

The table below gives the impact (in joules) for Group II equipment. It is an extract from the EN 50014 standard.

N.B. : When an item of electrical equipment is subjected to tests corresponding to a low risk of mechanical danger, it must be marked with the symbol «X» in accordance with article 27.2 point 9.

The indication «X» placed at the end of the certificate number can also indicate particular conditions of use.

ATX products are designed and certified to resist to high mechanical shock.

| Group II equipment  | Shock energy (in joules) |     |
|---|--------------------------|-----|
|   | High                     | Low |
| 1. Grids, protective covers, protective caps for fans, cable entries  | 7                        | 4   |
| 2. Plastic enclosures   | 7                        | 4   |
| 3. Lightweight alloy or cast-iron enclosures  | 7                        | 4   |
| 4. Enclosures of a material other than with walls 3 mm thick<br>- less than 3 mm for Group I<br>- less than 1 mm for Group II | 7                        | 4   |
| 5. Translucent parts without protective device  | 4                        | 2   |
| 6. Translucent parts with grid (tests to be carried out without the grid)   | 2                        | 1   |

### IK TABLE

| IK CODE                  | IK 00 | IK 01 | IK 02 | IK 03 | IK 04 | IK 05 | IK 06 | IK 07 | IK 08 | IK 09 | IK 10 |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Shock energy (in joules) | 0     | 0,15  | 0,20  | 0,35  | 0,50  | 0,70  | 1     | 2     | 5     | 10    | 20    |

By way of comparison : protection against mechanical shocks in accordance with article 4. 2 of EN 50 102 (february 1999).