

IP protection classes for electric machines and appliances

Protection against accidental contact, protection against ingress of foreign objects and water protection in accordance with IEC/EN 60529

IP = International Protection

| 1. digit | Protection scope | | Definition |
|----------|----------------------|--|---|
| | against contact | against foreign objects | |
| 0 | Without | Without | – |
| 1 | Large-surface, hand | Foreign objects $\geq 50 \text{ mm } \varnothing$ | The object probe, sphere of 50 mm diameter, shall not fully penetrate. |
| 2 | Fingers | Foreign objects $\geq 12,5 \text{ mm } \varnothing$ | The object probe, sphere of 12,5 mm diameter, shall not fully penetrate. |
| 3 | With tools and wires | Solid foreign objects $\geq 2,5 \text{ mm } \varnothing$ | The object probe, sphere of 2,5 mm diameter, shall not penetrate at all. |
| 4 | With tools and wires | Solid foreign objects $\geq 1 \text{ mm } \varnothing$ | The object probe, sphere of 1 mm diameter, shall not penetrate at all. |
| 5 | Complete | Dust | Ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of apparatus or to impair safety. |
| 6 | Complete | Dust-proof | No ingress of dust. |

| 2. digit | Protection scope against water | Definition |
|----------|---|---|
| 0 | Without | – |
| 1 | Dripping water, vertical | Vertically falling drops shall have no harmful effects. |
| 2 | Dripping water, vertical, inclination up to 15° | Vertically falling drops shall have no harmful effects when the enclosure is tilted at any angle up to 15° on either side of the vertical. |
| 3 | Spraying water, inclination up to 60° | Water sprayed at an angle up to 60° on either side of the vertical shall have no harmful effects. |
| 4 | Splashing water, from all directions | Water splashed against the enclosure from any direction shall have no harmful effects. |
| 5 | Jet-water from all directions | Water projected in jets against the enclosure from any direction shall have no harmful effects. |
| 6 | Jet-water and conditions on ship's deck | Water projected in powerful jets against the enclosure from any direction shall have no harmful effects. |
| 7 | Immersion | Ingress of water in quantities causing harmful effects shall not be possible when enclosure is temporarily immersed in water under standardised conditions of pressure and time. |
| 8 | Continuous submersion | Ingress of water in quantities causing harmful effects shall not be possible when enclosure is continuously immersed in water under conditions which shall be agreed between manufacturer and user. |
| 9 | Protected against high pressure and high water jet temperatures | Water projected in powerful jets from any direction against the enclosure at high pressure and at high temperatures shall have no harmful effects. |

Example

IP 65 = dust-proof and protection against jet-water from all directions