

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