



IP CODE

The **IP Code, International Protection Marking**, IEC standard 60529, sometimes interpreted as **Ingress Protection Marking**,^[1] classifies and rates the degree of protection provided against intrusion (body parts such as hands and fingers), dust, accidental contact, and water by mechanical casings and electrical enclosures. It is published by the International Electrotechnical Commission (IEC)

Solid particle protection

The first digit indicates the level of protection that the enclosure provides against access to hazardous parts (e.g., electrical conductors, moving parts) and the ingress of solid foreign objects.

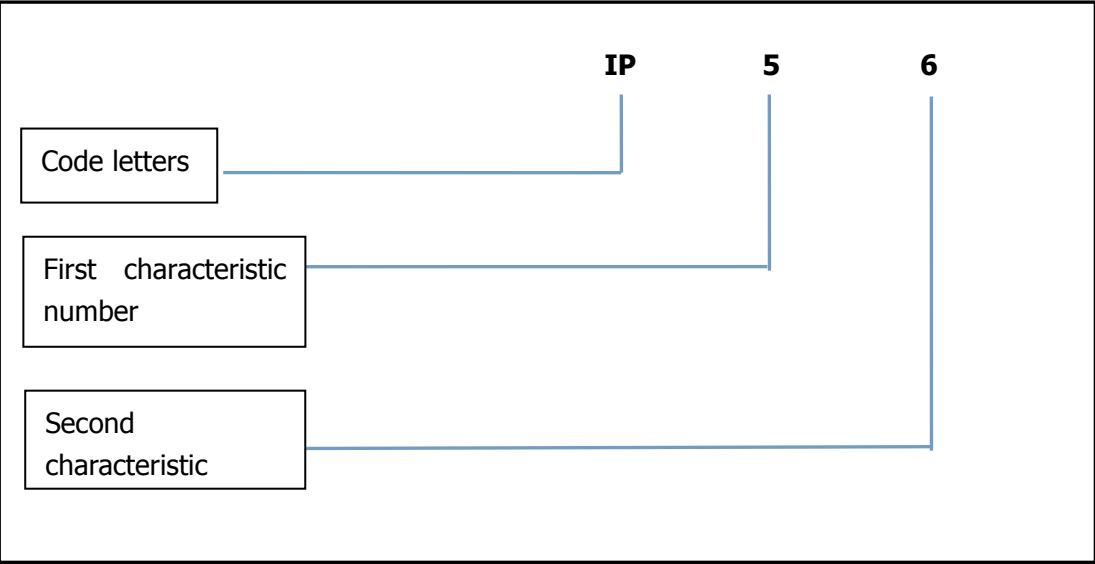
Level	Object size protected against	Effective against
0	—	No protection against contact and ingress of objects
1	>50 mm	Any large surface of the body, such as the back of a hand, but no protection against deliberate contact with a body part
2	>12.5 mm	Fingers or similar objects
3	>2.5 mm	Tools, thick 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 (dust proof)
6	Dust tight	No ingress of dust; complete protection against contact (dust tight)

Liquid ingress protection

The second digit indicates the level of protection that the enclosure provides against harmful ingress of water.

Level	Protected against	Testing for	Details
0	Not protected	—	—

1	Dripping water	Dripping water (vertically falling drops) shall have no harmful effect.	Test duration: 10 minutes Water equivalent to 1 mm rainfall per minute
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.	Test duration: 10 minutes Water equivalent to 3 mm rainfall per minute
3	Spraying water	Water falling as a spray at any angle up to 60° from the vertical shall have no harmful effect.	Test duration: 5 minutes Water volume: 0.7 litres per minute Pressure: 80–100 kPa
4	Splashing of water	Water splashing against the enclosure from any direction shall have no harmful effect.	Test duration: 5 minutes Water volume: 10 litres per minute Pressure: 80–100 kPa
5	Water jets	Water projected by a nozzle (6.3 mm) against enclosure from any direction shall have no harmful effects.	Test duration: at least 3 minutes Water volume: 12.5 litres per minute Pressure: 30 kPa at distance of 3 m
6	Powerful water jets	Water projected in powerful jets (12.5 mm nozzle) against the enclosure from any direction shall have no harmful effects.	Test duration: at least 3 minutes Water volume: 100 litres per minute Pressure: 100 kPa at distance of 3 m
6K	Powerful water jets with increased pressure	Water projected in powerful jets (6.3 mm nozzle) against the enclosure from any direction, under elevated pressure, shall have no harmful effects.	Test duration: at least 3 minutes Water volume: 75 litres per minute Pressure: 1000 kPa at distance of 3 m
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).	Test duration: 30 minutes Immersion at depth of at most 1 m measured at bottom of device, and at least 15 cm measured at top of device
8	Immersion beyond 1 m	The equipment is suitable for continuous immersion in water under conditions which shall be specified by the manufacturer. However, with certain types of equipment, it can mean that water can enter but only in such a manner that it produces no harmful effects.	Test duration: continuous immersion in water Depth specified by manufacturer, generally up to 3 m
9k	Powerful high temperature water jets	Protected against close-range high pressure, high temperature spray downs.	



First characteristic number			second characteristic number	
	protection of person	protection of equipment		protection of equipment
0	no protection	no protection(sometimes X)	0	no protection(sometimes X)
1	protected against contact with large areas of the body(e.g.,back of hand)	protected against solid objects up to 50mm ³	1	Protection against vertically falling drops of water(e.g.,condensation)
2	protected against contact with fingers	protected against solid objects up to 12mm in diameter	2	protection against direct sprays of water up to 15 degrees from vertical
3	protected against tools and wires over 2.5mm in diameter	protected against solid objects up to 2.5mm in diameter	3	protection against direct sprays of water up to 60 degrees from vertical
4	protected against tools and wires over 1mm in diameter	protected against solid objects up to 1mm in diameter	4	protection against water sprayed from all directions,limited ingress permitted

5	protected against tools and wires over 1mm in diameter	protected against dust:limited ingress(i.e.,no harmful deposit)	5	protected against low-pressure jets of water from all directions,limited ingress permitted
6	protected against tools and wires over 1mm in diameter	totally protected against dust	6	protected against strong jets of water from all directions,limited ingress permitted(e.g.,a ship's deck)
			7	protected against the effect of "temporary"immersion between 15cm and 1m
			8	protected against long periods of immersion under pressure
			9	protected against high pressure,high-temperature jets of water from multiple directions.

IP69K is defined in DIN40050-9