

## IP Rating

The IP Code (or **International Protection Rating**, sometimes also interpreted as **Ingress Protection Rating**) consists of the letters IP followed by two digits and an optional letter. As defined in international standard IEC 60529, it classifies the degrees of protection provided against the intrusion of solid objects – for example dust or water – in electrical enclosures. This standard aims to provide users more detailed information regarding the suitability of an electrical product for use in various environments or locations.

The digits indicate conformity with the conditions summarised in the tables below.

### First Digit – Solids

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

Level	Object Size Protected Against	Effective Against
0	Not Protected	No Protection Against Contact and Ingress
1	>50mm	Any large surface of the body, such as back of the hand, but no protection against deliberate contact with the body part
2	>12.5mm	Fingers or similar objects
3	>2.5mm	Tools, thick wires
4	>1mm	Wires, Screws, thin metal objects
5	Dust Protected	Ingress of dust not entirely prevented but must not enter in sufficient quantity that it would interfere with the satisfactory use of equipment. Completely protected against human external contact
6	Dust Tight	Completely protected against dust and human external contact.

### Second Digit – Liquids

The second digit indicates the level of protection that an enclosure provides against the harmful ingress of water or liquids in electrical equipment.

Level	Object Size Protected Against	Effective Against
0	Not Protected	N/A
1	Dripping Water	Dripping Water (Vertical) shall have no effect
2	Dripping Water when tilted to 15°	Dripping Water (Vertical) shall have no effect when enclosure is tilted to 15°
3	Water Spray	Water Spray up to 60° from vertical shall have no effect on enclosure or operation
4	Water Splash	Splashing from any direction shall have no effect on enclosure or operation
5	Water Jet	Water projected by nozzle (up to 6.3mm) shall have no effect on enclosure or operation
6	Powerful Water Jet	Water projected in powerful jets by nozzle (up to 12.5mm) shall have no effect on enclosure or operation
7	Immersion up to 1m	Product is suitable for immersion in water down to 1m in depth under defined conditions of pressure and time.
8	Immersion beyond 1m	Product is suitable for immersion in water beyond 1m in depth under defined conditions of pressure and time.

### IP Reference Chart

Level	Solids	Liquids
IP00	Not Protected	Not Protected
IP01	Not Protected	Protected from condensation
IP02	Not Protected	Dripping Water (Vertical) shall have no effect
IP03	Not Protected	Dripping Water (Vertical) shall have no effect when enclosure is tilted to 15°
IP04	Not Protected	Water Spray up to 60° from vertical shall have no effect on enclosure or operation
IP05	Not Protected	Splashing from any direction shall have no effect on enclosure or operation
IP06	Not Protected	Water projected by nozzle (up to 6.3mm) shall have no effect on enclosure or operation

IP07	Not Protected	Water projected in powerful jets by nozzle (up to 12.5mm) shall have no effect on enclosure or operation
IP08	Not Protected	Product is suitable for immersion in water down to 1m in depth under defined conditions of pressure and time.
IP10	>50mm	Not Protected
IP11	>50mm	Protected from condensation
IP12	>50mm	Dripping Water (Vertical) shall have no effect
IP13	>50mm	Dripping Water (Vertical) shall have no effect when enclosure is tilted to 15°
IP14	>50mm	Water Spray up to 60° from vertical shall have no effect on enclosure or operation
IP15	>50mm	Splashing from any direction shall have no effect on enclosure or operation
IP16	>50mm	Water projected by nozzle (up to 6.3mm) shall have no effect on enclosure or operation
IP17	>50mm	Water projected in powerful jets by nozzle (up to 12.5mm) shall have no effect on enclosure or operation
IP18	>50mm	Product is suitable for immersion in water down to 1m in depth under defined conditions of pressure and time.
IP20	>12mm	Not Protected
IP21	>12mm	Protected from condensation
IP22	>12mm	Dripping Water (Vertical) shall have no effect
IP23	>12mm	Dripping Water (Vertical) shall have no effect when enclosure is tilted to 15°
IP24	>12mm	Water Spray up to 60° from vertical shall have no effect on enclosure or operation
IP25	>12mm	Splashing from any direction shall have no effect on enclosure or operation
IP26	>12mm	Water projected by nozzle (up to 6.3mm) shall have no effect on enclosure or operation
IP27	>12mm	Water projected in powerful jets by nozzle (up to 12.5mm) shall have no effect on enclosure or operation

IP28	>12mm	Product is suitable for immersion in water down to 1m in depth under defined conditions of pressure and time.
IP30	>2.5mm	Not Protected
IP31	>2.5mm	Protected from condensation
IP32	>2.5mm	Dripping Water (Vertical) shall have no effect
IP33	>2.5mm	Dripping Water (Vertical) shall have no effect when enclosure is tilted to 15°
IP34	>2.5mm	Water Spray up to 60° from vertical shall have no effect on enclosure or operation
IP35	>2.5mm	Splashing from any direction shall have no effect on enclosure or operation
IP36	>2.5mm	Water projected by nozzle (up to 6.3mm) shall have no effect on enclosure or operation
IP37	>2.5mm	Water projected in powerful jets by nozzle (up to 12.5mm) shall have no effect on enclosure or operation
IP38	>2.5mm	Product is suitable for immersion in water down to 1m in depth under defined conditions of pressure and time.
IP40	>1mm	Not Protected
IP41	>1mm	Protected from condensation
IP42	>1mm	Dripping Water (Vertical) shall have no effect
IP43	>1mm	Dripping Water (Vertical) shall have no effect when enclosure is tilted to 15°
IP44	>1mm	Water Spray up to 60° from vertical shall have no effect on enclosure or operation
IP45	>1mm	Splashing from any direction shall have no effect on enclosure or operation
IP46	>1mm	Water projected by nozzle (up to 6.3mm) shall have no effect on enclosure or operation
IP47	>1mm	Water projected in powerful jets by nozzle (up to 12.5mm) shall have no effect on enclosure or operation
IP48	>1mm	Product is suitable for immersion in water down to 1m in depth under defined conditions of pressure and time.

IP50	Protected against limited dust ingress	Not Protected
IP51	Protected against limited dust ingress	Protected from condensation
IP52	Protected against limited dust ingress	Dripping Water (Vertical) shall have no effect
IP53	Protected against limited dust ingress	Dripping Water (Vertical) shall have no effect when enclosure is tilted to 15°
IP54	Protected against limited dust ingress	Water Spray up to 60° from vertical shall have no effect on enclosure or operation
IP55	Protected against limited dust ingress	Splashing from any direction shall have no effect on enclosure or operation
IP56	Protected against limited dust ingress	Water projected by nozzle (up to 6.3mm) shall have no effect on enclosure or operation
IP57	Protected against limited dust ingress	Water projected in powerful jets by nozzle (up to 12.5mm) shall have no effect on enclosure or operation
IP58	Protected against limited dust ingress	Product is suitable for immersion in water down to 1m in depth under defined conditions of pressure and time.
IP60	Dust Tight	Not Protected
IP61	Dust Tight	Not Protected
IP62	Dust Tight	Protected from condensation
IP63	Dust Tight	Dripping Water (Vertical) shall have no effect
IP64	Dust Tight	Dripping Water (Vertical) shall have no effect when enclosure is tilted to 15°
IP65	Dust Tight	Water Spray up to 60° from vertical shall have no effect on enclosure or operation
IP66	Dust Tight	Splashing from any direction shall have no effect on enclosure or operation
IP67	Dust Tight	Water projected by nozzle (up to 6.3mm) shall have no effect on enclosure or operation
IP68	Dust Tight	Water projected in powerful jets by nozzle (up to 12.5mm) shall have no effect on enclosure or operation
IP69K	Dust Tight	Protected from steam jet-cleaning