



## Motor surface cooled

Protection	1 <sup>st</sup> digit		2 <sup>nd</sup> digit
	Contact protection	Ingress of solid foreign particles	Ingress of liquid
IP 44	contact with tools or similar	against solid foreign bodies over 1 mm Ø	splashing from all directions
IP 50	complete protection against contact	damaging dust deposits	no protection
IP 54	contact with tools or similar	against solid foreign bodies over 1 mm Ø	splashing from all directions
IP 55	complete protection against contact	damaging dust deposits	water jets from all directions
IP 56	complete protection against contact	damaging dust deposits	momentarily flooding
IP 65	complete protection against contact	against ingress of dust	water jets from all directions

## IP protection according to EN 60529

Depending on the operating and environmental conditions the damaging effect of water, foreign particles and dust and the contact with live or moving parts inside a motor is to be prevented by choosing a suitable protection.

The marking used to indicate the degree of protection consists of the letters IP followed by two characteristic numerals.

The marking applies to the unit as it is supplied and the defined or usual location of the unit.

The protection can change if the unit is located or fitted differently.

## Protection against contact and solid foreign particles

### First digit 0 No protection

No protection of persons against contact with live or moving parts inside the enclosure. No protection of equipment against ingress of solid foreign particles.

### First digit 1 Protection against large solid foreign particles

Protection against accidental or inadvertent contact with live or moving parts inside the enclosure by a large surface of the human body, e.g. hand, but not protected against deliberate access to such parts.

### First digit 2 Protection against med. size solid foreign particles

Protection against contact with live or moving parts inside the enclosure by fingers. Protection against ingress of medium size solid foreign particles of diameter greater than 12 mm.

### First digit 3 Protection against small solid foreign particles

Protection against contact with live or moving parts inside the enclosure by tools, wires or such objects of thickness greater than 2.5 mm. Protection against ingress of small solid foreign particles of diameter greater than 2,5 mm.

### First digit 4 Protection against granular structured foreign particles

Protection against contact with live or moving parts inside the enclosure by tools, wires or such objects of thickness greater than 1 mm. Protection against ingress of granular structured solid foreign particles of diameter greater than 1 mm.

### First digit 5 Protection against dust deposits

Complete protection against contact with live or moving parts inside the enclosure. Protection against harmful deposits of dust. The ingress of dust is not totally prevented, but dust cannot enter in an amount sufficient to interfere with the satisfactory operation of the equipment enclosed.

### First digit 6 Complete protection

Complete protection against contact with live or moving parts inside the enclosure. Protected against the ingress of dust.

## Protection against liquids

### Second digit 0 No protection

No particular protection

### Second digit 1 Protection against vertical water drops

Droplets of condensed water falling on the enclosure shall have no harmful effects.

### Second digit 2 Protection against diagonal falling water drops

Protection against dripping liquids. Droplets of falling liquid shall have no harmful effect when the enclosure is tilted at any angle up to 15° from the vertical.

### Second digit 3 Protection against spray water

Protection against dripping liquids. Water falling as rain at an angle equal to or smaller than 60° in respect to the vertical shall have no harmful effect.

### Second digit 4 Protection against splashing

Liquid splashed from any direction shall have no harmful effect.

### Second digit 5 Protection against water jets

Water projected by a nozzle from any direction under stated conditions shall have no harmful effect.

### Second digit 6 Protection against flooding

Protection against conditions on ships decks (deck watertight equipment). Water from heavy seas shall not enter the enclosure under prescribed conditions<sup>2)</sup>.

### Second digit 7 Protection against immersion in water

It shall not be possible for water to enter the enclosure under stated conditions of pressure and time<sup>2)</sup>.

### Second digit 8 Protection against indefinite immersion

Protection against indefinite immersion in water. Under specific pressure it shall not be possible for water to enter the enclosure<sup>2)</sup>.

<sup>2)</sup> In certain cases water should not ingress. As required this is defined on the follow-on page of the unit in question.