

Creepage distances and clearances
Degrees of protection

Creepage distances and clearances according to EN 50107

The European standard EN 50107 requires minimum distances (creepage distances and clearances) between the active (live) parts of the high-voltage circuit and earthed metal parts.

The size of these distances mainly depends on the open circuit voltage of the transformer or convertor used: the higher the transformer voltage, the larger the required clearances and creepage distances.

Minimum required **clearance** according to EV 50107 (in Millimeter):

Transf.- voltage	Conventional transformer		EVG
	indoor	outdoor	
1 kV	7	11,25	13,5
2 kV	12	15	18
3 kV	15	18,75	22,5
4 kV	18	22,5	27
5 kV	21	26,25	31,5
6 kV	24	30	36
8 kV	30	37,5	45

Minimum required **creepage distances** according to EV 50107 (in Millimeter):

Transf.- voltage	Conventional transformer		EVG
	indoor	outdoor	
1 kV	12	15	18
2 kV	16	20	24
3 kV	20	25	30
4 kV	24	30	36
5 kV	28	35	42
6 kV	32	40	48
8 kV	40	50	60

Degrees of protection acc. to DIN 40050

According to DIN 40050, electrical equipment is divided into different degrees of protection which are identified by international symbols (IP = International Protection).

The abbreviation "IP" is followed by two-digit number. The first digit represents the protection against ingress of solid bodies, whereas the second digit indicates the degree of protection against ingress of water. No protection is required if the two digits are replaced by an "x".

First digit	Degree of protection (against human contact and foreign bodies)
0	No special protection
1	Protection against ingress of large foreign bodies (diameter > 50 mm)
2	Protection against ingress of medium-sized foreign bodies (diameter > 12 mm)
3	Protection against ingress of small foreign bodies (diameter > 2.5 mm)
4	Protection against ingress of granular foreign bodies (diameter > 1mm)
5	Protection against harmful dust deposits (dust-protected)
6	Protection against ingress of dust (dust-proof)

Second digit	Degree of protection (against water)
0	No special protection
1	Protection against vertically falling drops of water (dripping water)
2	Protection against water drops falling at an angle of up to 15° from the vertical (diagonally dripping water)
3	Protection against water falling at an angle of up to 60° from the vertical (spray water)
4	Protection against water splashing from all directions (splash water)
5	Protection against water jets projected by a nozzle from any direction (jet water)
6	Protection against heavy seas or powerful water jets (flooding)
7	Protection against water under standardized pressure and time conditions (temporary immersion)
8	Protection against water when the equipment is continuously immersed (permanent immersion)

↑
First digit:
Protection against human contact and foreign bodies

IP **1** **3** Second digit:
Protection against water ↑