

Protection against contact, ingress of solid foreign bodies and water in low voltage switchgear (extract from DIN 40050).

## Structure of the codes

The protection classes are specified in the form of a code made up of two invariable letter IP = International Protection and two digits identifying the protection class.

## Specifications

### Letters IP

Protection against contact and against ingress of solid foreign bodies and water

### First Digit 0 to 6

Protects persons against contact with live parts during operation or ensures that persons can not approach such parts within the devices (casings) and protects the devices against ingress of solid foreign bodies (protection against contact and solid foreign bodies).

### Second Digit 0 to 8

Degree of protection against dangerous ingress of water (water protection).

Example for specification of a protection class as per DIN 40050	IP	4	3
	Code Letters	First Digit	Second Digit

If only one digit has been specified for the degree of protection in addition to the code letters IP in the descriptions, the missing digit must be replaced by an "X", such as IPX4 or IP3X. If the protection class of one part of the device, such as the area around the terminal, differs from that of the main part, the protection class of the divergent part must be specified separately; the lower protection class is mentioned first.

Example:  
 IP00 - manual area IP54. A higher protection class means that the lower protection classes are fully satisfied. The protection class is stated with reference to the delivery condition and specified or conventional installation of the device. Unless specified otherwise, the stated protection class always applies for the entire device.

## General specifications for tests

The IP protection class tests are type tests. The tests for protection against ingress of water must be carried out using fresh water (e.g. drinking water without additives). The protection class may change, if device is installed or assembled in different manner.

## Installation instructions

Extract from DIN 46320. Part 1: "Cable glands for leads and cables". The following point must be noted during assembly: If protection class IP65 or a higher protection class to DIN 40050 is to be achieved, the compression screw on the cable gland must be additionally sealed with a suitable grouting compound after inserting the lead. Care must be taken to ensure conscientious assembly.



### Degree of protection against contact and ingress of solid foreign bodies

#### First Digit Degree of protection (against contact and ingress of solid foreign bodies)

0	No particular protection.	
1	Protection against solid bodies with diameter > 50mm.	Protected against the acces with the back of the hand.
2	Protection against solid bodies with diameter > 12mm.	Fingers or similars object can not be inserted.
3	Protection against ingress of solid foreign bodies with diameter > 2.5mm (small foreign bodies).	Tools, wires or similars items with thickness > 2.5mm can not be inserted.
4	Protection against ingress of solid foreign bodies with diameter > 1mm (granular foreign bodies).	Tools, wires or similars items with thickness > 1mm can not be inserted.
5	Protection against dust dangerous deposit. The ingress of dust is not prevented completely, however, dust is not allowed to enter in such quantities as to impair operation of the device (protected against dust).	Completely protection against contact.
6	Protection against ingress of dust (dust-proof).	Completely protection against contact.

### Degree of protection against ingress of water

#### Second Digit Degree of protection (against ingress of water)

0	No particular protection.	
1	Protection against dripping water falling perpendicularly.	There must be no detrimental effects (dripping water).
2	Protection against water falling at any angle up to 15° from the perpendicular.	A device (casing) tilted up to 15° out of its normal position must not suffer any detrimental effects (obliquely incident dripping water).
3	Protection against water falling at any angle up to 60° from the perpendicular.	There must be no detrimental effects (water splash).
4	Protection against a jet of water directed towards the device (casing) from all directions.	There must be no detrimental effects (water jets).
5	Protection against a water jet from a nozzle direct toward the device (casing) from all directions.	There must be no detrimental effects (water jets).
6	Protection against rough seas or strong water jets.	Water must not penetrate inside device (casing) in dangerous quantities (flooding).
7	Protection against water when the device (casing) is immersed in water under specified conditions with regard to pressure and time.	Water must not penetrate in dangerous quantities (flooding).
8	The device (casing) is suitable for permanent immersion in water under conditions to be prescribed by the manufacturer (immersion).	

#### Useful Links:

- » [Reed Switches Protection](#)
- » [Guide Level Switches and Flow Switches](#)