

Electrical apparatus for use in hazardous areas needs to be designed and constructed in such a way that it will not provide a source of ignition. There are ten recognized types of protection for hazardous area electrical apparatus. Each type of protection achieves its safety from ignition in different ways and not all are equally safe. In addition to the equipment being suitable for the Gas Group and the Temperature Class required, the type of protection must be suitable for the zone in which it is to be installed. The different types of protection and the zones for which they are suitable are as follows:

Equipment Code	Description	Suitable for zones...
Ex ia	Intrinsic safety 'ia'	0, 1, 2
Ex ib	Intrinsic safety 'ib'	1,2
Ex ic	Intrinsic Safety 'ic'	2
Ex d	Flameproof protection	1,2
Ex p	Purge/pressurized protection	1,2
Ex px	Purge/pressurized protection 'px'	1,2
Ex py	Purge/pressurized protection 'py'	1,2
Ex pz	Purge/pressurized protection 'pz'	2
Ex e	Increased safety	1,2
Ex m	Encapsulation	1,2
Ex ma	Encapsulation	0,1,2
Ex mb	Encapsulation	1.2
Ex o	Oil immersion	1,2
Ex q	Sand / powder (quartz) filling	1,2
Ex n	Type - n protection	2
Ex s	Special protection	Normally 1 and 2

Equipment complying with European (CENELEC) standards will bear the code EEx.

IP RATING

First Number <i>Refers to protection against solids</i>	Meaning	Second Number <i>Refers to protection against liquids</i>	Meaning
0	No protection	0	No protection
1	Protected against solid objects over 50mm (e.g. accidental touch by the hand)	1	Protected against water falling vertically
2	Protected against solid objects over 12mm (e.g. accidental touch by the finger)	2	Protected against direct sprays from up to 15 degrees from vertical
3	Protected against solid objects over 2.5mm (e.g. tools, wires)	3	Protected against direct sprays up to 60 degrees from vertical
4	Protected against solid objects over 1mm (e.g. small wires)	4	Protected against sprays from all directions. Limited ingress permitted.
5	Protected against dust – limited ingress (no harmful deposit)	5	Protected against low pressure jets of water from all directions. Limited ingress permitted.
6	Totally protected against all dust	6	Protected against strong jets of water. Limited ingress permitted. E.g. acceptable for use on shipdecks.
		7	Protected against temporary affects of immersion between 15cm and 1m, for 30 minutes.
		8	Protected against long periods of immersion under pressure.