

Introduction to enclosures and thermostats with enclosures of types Y0 to Y5

Machine control equipment	Where fluids may be present, e.g. lathes, millers etc., minimum protection typically requested is IP54. Consideration should also be given to the corrosive properties of certain fluids
Heavy Industrial, Chemical.	These environments are not usually totally clean, with possible presence of corrosive elements and harmful deposits of dust. Protection to IP54 will be typically required, with special consideration given to the corrosion resisting properties of the enclosure. When explosion risks exist, enclosures and equipment should meet the specifications of these environments.
Food Processing	Will vary depending on the type of food being processed and the possible requirement for washing down. Where fine powders are present, a minimum of IP53 should be used. This should be increased to IP54/65 if the equipment needs to be washed or hosed down. If the equipment should be washed with a jet of hot or cold water under high pressure, it is possible that the IP 65 rating is insufficient and that the IP69K is required
Dump trucks, cement mixers, food industry, car wash	In these high-pressure, high-temperature wash-down applications, enclosures must not only be dust tight (IP6X), but also able to withstand high-pressure and steam cleaning. The recommended protection rating is IP69K (DIN40050-9)
Weather proof equipment	If subjected to exposure to any specific weather condition, an agreement between the User and Manufacturer is necessary, with consideration given to specific testing conditions, including the corrosion resisting properties of the enclosure, fittings and cable glands

IK : Mechanical impact resistance (EN62262)

This mechanical impact is identified by the energy needed to qualify a specified resistance level, which is measured in joules (J). Protection class impact resistance was eventually given previously by the third digit of the IP rating. It was dropped during the 3rd edition of IEC60529 (1978), and replaced by an independent marking specified by the EN62262 standard.

Although dropped from the 3rd edition of IEC 60529 onwards, and not present in the current EN versions, older enclosure specifications will sometimes be seen with an optional third IP digit denoting impact resistance. Newer enclosures must be coded with an IK rating. However there is not an exact correspondence of values between the old and new standards.

Obsolete IP third number for mechanical impact resistance

IP third digit	Impact energy (Joules)	Equivalent drop mass and height
0	Unprotected	No test
1	0.225	150 g dropped from 15 cm
2	0.375	250 g dropped from 15 cm
3	0.5	250 g dropped from 20 cm
5	2	500 g dropped from 40 cm
7	6	1.5 kg dropped from 40 cm
9	20	5.0 kg dropped from 40 cm

IK mechanical impact resistance values

IK number	Impact energy (Joules)	Equivalent drop mass and height
00	Unprotected	No test
01	0.15	200 g dropped from 7.5 cm
02	0.2	200 g dropped from 10 cm
03	0.35	200 g dropped from 17.5 cm
04	0.5	200 g dropped from 25 cm
05	0.7	200 g dropped from 35 cm
06	1	500 g dropped from 20 cm
07	2	500 g dropped from 40 cm
08	5	1.7 kg dropped from 29.5 cm
09	10	5 kg dropped from 20 cm
10	20	5 kg dropped from 40 cm

Other classifications

NFC 15100 standard also refers to a “water drop” marking that household appliances and lightings can wear depending on their protection rating. This marking is different from the IP marking. Double marking, the water drops and the IP code, is not allowed because the tests are different.

Description	Protected against vertical water drops	Protected against rainfall	Protected against splashing water	Protected against water jets	Protected against immersion up to 1 m
IP equivalent	IPX1	IPX3	IPX4	IPX5	IPX7
Standard logo					

NEMA (USA) rating equivalences with IP

The United States National Electrical Manufacturers Association (NEMA) also publishes protection ratings for enclosures similar to the IP rating system published by the International Electro-technical Commission (IEC). However, it also dictates other product features not addressed by IP codes, such as corrosion resistance, gasket aging, and construction practices. Thus, while it is possible to map IP Codes to NEMA ratings that satisfy or exceed the IP Code criteria, it is not possible to map NEMA ratings to IP codes, as the IP Code does not mandate the additional requirements. The below table indicates the minimum NEMA rating that satisfies a given IP code, but can only be used in that way, not to map IP to NEMA.

North American enclosure rating systems are defined in NEMA 250, UL 50, UL 508, and CSA C22.2 N°. 94.

Equivalent IP Code	Min. NEMA Enclosure rating to satisfy IP Code.
IP20	NEMA-1
IP54	NEMA-3
IP66	NEMA-4, NEMA-4X
IP67	NEMA-6
IP68	NEMA-6P

Because of permanent improvement of our products, drawings, descriptions, features used on these data sheets are for guidance only and can be modified without prior advice

