



Enclosure Ratings

Type Designation	Canadian Standards Association (Standard C22.2, #'s 14, 40, & 94)	National Electric Manufacturers Association (NEMA Standard 250)	Underwriters Laboratories Inc. (UL 50 and UL 508)
1	General purpose enclosure. Protects against accidental contact with live parts.	Enclosures are intended for use indoors, primarily to prevent accidental contact of personnel with the enclosed equipment in areas where unusual service conditions do not exist.	Indoor use primarily to provide a degree of protection against contact with the enclosed equipment and against a limited amount of falling dirt.
2	An Enclosure for indoor use, constructed so as to provide a degree of protection against dripping and light splashing of non-corrosive liquids and falling dirt.	An enclosure for indoor use, primarily to provide a degree of protection against contact with the enclosed equipment and against a limited amount of falling water and dirt.	An enclosure for indoor use, constructed so as to provide a degree of protection against dripping and light splashing of non-corrosive liquids, and falling dirt.
3	An enclosure for either indoor or outdoor use, constructed so as to provide a degree of protection against rain, snow and windblown dust; undamaged by the external formation of ice on the enclosure.	An enclosure intended for outdoor use primarily to provide a degree of protection against windblown dust, rain, sleet, and external ice formation.	An enclosure for outdoor use to provide a degree of protection against windblown dust, rain and sleet; undamaged by the formation of ice on the enclosure.
3R	An enclosure for either indoor or outdoor use, constructed so as to provide a degree of protection against rain and snow, undamaged by the external formation of ice on the enclosure.	An enclosure intended for outdoor use primarily to provide a degree of protection against falling rain, sleet and ice formation (may be ventilated)	An enclosure for outdoor use to provide a degree of protection against falling rain and sleet; undamaged by the formation of ice on the enclosure.
3S	An enclosure for either indoor or outdoor use, constructed so as to provide a degree of protection against rain, snow and windblown dust; the external mechanism(s) remain operable.	An enclosure intended for outdoor use, to protect the enclosed equipment against windblown dust and water and to provide for its operation when the enclosure is covered by external ice or sleet. It does not protect the enclosed equipment against malfunction resulting from internal icing.	N/A



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4	An enclosure for either indoor or outdoor use, constructed so as to provide a degree of protection against rain, snow and windblown dust; splashing and hose-directed water; undamaged by the external formation of ice on the enclosure.	An enclosure intended for indoor or outdoor use, to protect the enclosed equipment against splashing water, seepage of water, falling or hose-directed water, and severe external condensation. They are sleet resistant but not sleet (ice) proof.	An enclosure for indoor or outdoor use to provide a degree of protection against splashing water, windblown dust, and rain and by hose-directed water; undamaged by the formation of ice on the enclosure.
4X	An enclosure for either indoor or outdoor use, constructed so as to provide a degree of protection against rain, snow and windblown dust; splashing and hose-directed water; undamaged by the external formation of ice on the enclosure; resists corrosion.	Type 4X enclosures have the same provisions as type 4 enclosures and, in addition, are corrosion resistant.	An enclosure for indoor or outdoor use to provide a degree of protection against splashing water, windblown dust and rain, and hose-directed water; undamaged by the formation of ice on the enclosure; resists corrosion.
5	An enclosure for indoor use, constructed so as to provide a degree of protection against dripping and light splashing of non-corrosive liquids, and settling dust, lint, fibres and flyings.	Superseded by NEMA 12	N/A
6	An enclosure for either indoor or outdoor use, constructed so as to provide a degree of protection against the entry of water during temporary submersion at a limited depth; undamaged by the external formation of ice on the enclosure.	An enclosure intended for use indoors or outdoors where occasional submersion is encountered.	N/A



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6P		An enclosure for either indoor or outdoor use, constructed so as to provide a degree of protection against the entry of water during prolonged submersion at a limited depth; undamaged by the external formation of ice on the enclosure; resists extended corrosion.	An enclosure intended for indoor or outdoor use primarily to provide a degree of protection against the entry of water during prolonged submersion at a limited depth.	N/A
7	N/A		An enclosure intended for use indoors, in the atmospheres and locations defined as Class I and Group A, B, C or D in the National Electrical Code. The letters indicate the gas or vapor in the hazardous location.	N/A
8	N/A		Enclosures intended for indoor or outdoor use in locations classified as class I, Groups A, B, C, or D, as defined in the National Electrical Code. The letters indicate the gas or vapor in	N/A
9	N/A		An enclosure intended for use indoors in the atmospheres defined in Class II and Group E, F or G in the National Electrical Code. The letters indicate the dust in the hazardous location.	N/A
10	N/A		Designed to meet the requirements of the U.S. Bureau of Mines which relate to atmospheres containing mixtures of methane and air, with or without coal dust.	N/A



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11	N/A	An enclosure intended for indoor use primarily to provide, by oil immersion, a degree of protection to enclosed equipment against the corrosive effects of liquids and gasses.	N/A
12	An enclosure indoor use, constructed so as to provide a degree of protection against circulating dust, lint, fibres, and flyings; dripping and light splashing of non-corrosive liquids; not provided with knockouts.	An enclosure intended for indoor use to protect the enclosed equipment against fibres, flyings, lint, dust and dirt, and light splashing, seepage dripping and external condensation of non-corrosive liquids.	An enclosure for indoor use to provide a degree of protection against dust, falling dirt, and dripping non-corrosive liquids.
12K	An enclosure indoor use, constructed so as to provide a degree of protection against circulating dust, lint, fibres, and flyings; dripping and light splashing on non-corrosive liquids; and provided with knockouts.	An enclosure with knockouts that are intended for indoor use, primarily to provide a degree of protection against dust, falling dirt, and dripping non-corrosive liquids other than at knockouts.	N/A
13	An enclosure indoor use, constructed so as to provide a degree of protection against circulating dust, lint, fibres, and flyings; seepage and spraying of non-corrosive liquids including oils and coolants.	An enclosure intended for use indoors primarily to house pilot devices such as limit switches, foot switches, push buttons, selector switches, pilot lights etc., and to protect these devices against lint and dust, seepage, external condensation, and spraying of water, oil, and coolant.	An enclosure for indoor use to provide a degree of protection against dust and spraying of water, oil, and non-corrosive coolants.



Table 1: Enclosure Ratings Definitions and Comparisons for CSA, NEMA and UL

First No.	Degrees of Contact Prevention and Guarding Against Foreign Objects
0	No protection of personnel from direct contact with active or moving parts. No protection from access of a solid foreign object.
1	Protection of personnel from accidental large area direct contact with active or internal moving parts but no guard against intentional access to such parts. Protection from access of solid foreign object larger than 50mm in diameter.
2	Protection of personnel from finger contact with active or internal moving parts. Protection from access of solid foreign object larger than 12mm in diameter.
3	Protection of personnel from touching active or internal moving parts with tools, wires or similar foreign objects thicker than 2.5mm.. Protection from access of solid foreign matter larger than 2.5mm in diameter.
4	Protection of personnel from touching active or internal moving parts with tools, wires or similar foreign objects thicker than 1mm.
5	Total protection of personnel from touching voltage carrying or internal moving parts. Protection from harmful deposit of dust. Access of dust is not completely prevented.
6	Total protection of personnel from touching voltage carrying or internal moving parts. Protection from access of dust.

Second No.

Degrees of Water Protection

0	No special protection
1	Water drops falling vertically must not have any harmful effect.
2	Water drops falling at any angle up to 15° from the vertical must not have any harmful effect.
3	Water hitting the object any any angle up to 60° with the vertical must not have any harmful effect.
4	Water splashing against the object from all directions must not have any harmful effect.
5	A jet of water nozzled from all directions must not have any harmful effect.
6	Water from a temporary floodings, such as heavy seas, must not enter in any harmful quantity.
7	If the object is dipped into water under the defined conditions of pressure and time, water must not enter it in any harmful quantity.
8	If the object is submerged in water, water must not enter in any harmful quantity.

Table 2: Enclosure Rating Definitions for IEC (International Electrotechnical Commission)

The IEC enclosure rating always starts with the letters

Nema Rating IEC Rating

1	IP23
2	IP30
3	IP64
3R	IP32
4	IP66
4X	IP66
6	IP67
12	IP65
13	IP65

Table 3: NEMA / IEC Enclosure Rating Cross Reference

Note: The specifications on this page are for reference only and are not intended to provide complete requirements or test qualifications published by various associations and agencies. Complete information may be obtained by contacting the appropriate organization.