



Panel Enclosure Standards & Specifications

CSI uses panel enclosures that meet the general standards of NEMA (National Electrical Manufacturers Association) and EEMAC (Electrical and Electronic Mfg. Association of Canada). Shown below are enclosure types with a general description of performance specifications from NEMA, UL (Underwriters Laboratories, Inc.) and CSA (Canadian Standards Association), now affiliated with UL.

Enclosure Rating	NEMA / EEMAC (NEMA Standard 250)	UL (UL 50 and UL 508)	CSA (Standard C22.2 No. 94)
Type 1	Enclosures are intended for indoor use primarily to provide a degree of protection against contact with the enclosed equipment or locations where unusual service conditions do not exist.	Indoor use primarily to provide protection against contact with the enclosed equipment and against a limited amount of falling dirt.	General-purpose enclosure. Protects against accidental contact with live parts.
Type 2	Enclosures are intended for indoor use primarily to provide a degree of protection against limited amounts of falling water and dirt.	Indoor use to provide a degree of protection against limited amount of falling water and dirt.	Indoor use to provide a degree of protection against dripping and light splashing of non-corrosive liquids and falling dirt.
Type 3	Enclosures are intended for outdoor use primarily to provide a degree of protection against windblown dust, and rain, and sleet; undamaged by the formation of ice on the enclosure.	Outdoor use to provide a degree of protection against windblown dust and rain; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against rain, snow, and windblown dust; undamaged by the external formation of ice on the enclosure.
Type 3R	Enclosures are intended for outdoor use primarily to provide a degree of protection against falling rain and sleet; undamaged by the formation of ice on the enclosure.	Outdoor use to provide a degree of protection against falling rain; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against rain and snow; undamaged by the external formation of ice on the enclosure.
Type 4	Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, and hose-directed water; undamaged by the formation of ice on the enclosure.	Either indoor or outdoor use to provide a degree of protection against falling rain, splashing water and hose-directed water; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides 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.
Type 4X	Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose-directed water; undamaged by the formation of ice on the enclosure.	Either indoor or outdoor use to provide a degree of protection against falling rain, splashing water and hose-directed water; undamaged by the formation of ice on the enclosure; resists corrosion.	Indoor or outdoor use; provides 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 6	Enclosures are intended for indoor or outdoor use where occasional submersion is encountered at limited depth; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use to provide a degree of protection against entry of water during temporary submersion at a limited depth; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against entry of water during temporary submersion.
Type 12	Enclosures are intended for indoor use primarily to provide a degree of protection against dust, falling dirt, and dripping non-corrosive liquid.	Indoor use to primarily to provide a degree of protection against dust, dirt, fiber flyings, dripping water, and external condensation of non-corrosive liquids.	Indoor use; provides a degree of protection against circulating dust, lint, fibers, and flyings; dripping and light splashing of non-corrosive liquids; not provided with knockouts.
Type 13	Enclosures are intended for indoor use primarily to provide a degree of protection against dust, spraying of water, oil, and non-corrosive coolants.	Indoor use to provide a degree of protection against dust, seepage, external condensation and spraying of water, oil, and non-corrosive liquids.	Indoor use; provides a degree of protection against circulating dust, lint, fibers, and flyings; seepage and spraying of non-corrosive liquids, including oils and coolants.

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Comparison of Specific Non-Hazardous Applications - Outdoor & Indoor Locations

Provides a Degree of Protection Against the following Environmental Conditions	Type of Enclosure								
	1*	2*	3	3R**	4	4X	6	12	13
Incidental Contact with the enclosed equipment	•	•	•	•	•	•	•	•	•
Rain, snow, and sleet++			•	•	•	•	•		
Sleet##									
Windblown dust			•		•	•	•		
Hosedown					•	•	•		
Corrosive agents						•			
Occasional temporary submersion							•		
Occasional prolonged submersion									
Falling dirt	•	•	•	•	•	•	•	•	•
Falling liquids and light splashing		•			•	•	•	•	•
Dust, lint, fibers and flyings#					•	•	•	•	•
Hosedown and splashing water					•	•	•		
Oil and coolant seepage								•	•
Oil or coolant spraying and splashing									•

* These enclosures may be ventilated. However, Type 1 may not provide protection against small particles of falling dirt when ventilation is provided in the enclosure top.

These fibers and flyings are non-hazardous materials and are not considered Class II type ignitable fibers or combustible flyings. For Class III type ignitable fibers or combustible flyings see the National Electric Code Section 500-6(a).

++ External operating mechanisms are not required to be operable when the enclosure is ice covered.

External operating mechanisms are not operable when the enclosure is ice covered.

** These enclosures may be ventilated.

Cross-Reference (Approximate) NEMA, UL CSA vs. IEC Enclosure Type

Enclosure Rating	IP23	IP30	IP32	IP55	IP64	IP65	IP66	IP67
Type 1	•							
Type 2		•						
Type 3					•			
Type 3R			•					
Type 4							•	
Type 4X							•	
Type 6								•
Type 12				•				
Type 13						•		

Note: Cannot be used to convert IEC Classifications to NEMA Type numbers.