

<http://waterheatertimer.org/Intermatic-and-Grasslin-Enclosures.html>

<http://waterheatertimer.org/How-to-wire-Whole-house-surge-protector.html>

**Enclosure Type Cross Reference: NEMA/UL/CSA**

<p><b>NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION</b>  <i>NEMA Standards Publication No. 250-1991, Enclosures for Electrical Equipment (1000V max.)</i></p>
<p><b>Intended Use and Description</b></p> <p>An enclosure is a surrounding case that provides personnel with protection against incidental contact with enclosed equipment, and simultaneously protects enclosed equipment against specific environmental conditions.</p>
<p><b>Type 1</b> - Enclosures are intended for indoor use primarily to protect against limited amounts of falling dirt.</p>
<p><b>Type 2</b> - Enclosures provide a degree of protection, mainly indoors, against limited amounts of dripping water or falling dirt.</p>
<p><b>Type 3</b> - Enclosures, intended primarily for use outdoors, protect against rain, sleet, wind-blown dust, and damage from external ice formation.</p>
<p><b>Type 3R</b> - Enclosures provide protection primarily against rain, sleet, and damage from external ice formation.</p>
<p><b>Type 3S</b> - Enclosures protect primarily against rain, sleet, and wind-blown dust, and enable external mechanisms to operate efficiently even when ice laden.</p>
<p><b>Type 4</b> - Enclosures provide protection, both indoors and out, against wind-blown dust and rain, splashing or hose-directed water, and ice damage.</p>

<p><b>UNDERWRITERS LABORATORIES UL50</b>  <i>Standard for Enclosures for Electrical Equipment (10th Edition)</i></p>
<p><b>Intended Use and Description</b></p> <p>An enclosure is a surrounding case that protects equipment enclosed within against incidental contact, as well as specific environmental conditions. A complete enclosure shall be provided for all live parts that may be housed in it. Such an enclosure shall be tight and come with a means for mounting, unless it's designed for a special installation, for example, a cast metal junction or pull-box intended for installation in poured concrete.</p>
<p><b>Type 1</b> - Enclosures are intended for indoor use primarily to protect against limited amounts of falling dirt.</p>
<p><b>Type 2</b> - Enclosures provide a degree of protection, mainly indoors, against limited amounts of dripping water or falling dirt.</p>
<p><b>Type 3</b> - Enclosures, intended primarily for use outdoors, protect against rain, sleet, wind-blown dust, and damage from external ice formation.</p>
<p><b>Type 3R</b> - Used primarily outdoors for protection against rain, sleet, and exterior damage caused by the formation of ice.</p>
<p><b>Type 3S</b> - Used primarily outdoors for protection against rain, sleet, and wind-blown dust, and to enable exterior mechanisms to operate when ice laden.</p>
<p><b>Type 4</b> - For indoor and outdoor use to protect against wind-blown dust and rain, splashing or hose-directed water, and damage caused by exterior ice formation.</p>

<p><b>CANADIAN STANDARDS ASSOCIATION</b>  <b>CAN/CSA C22.2 No. 94-M91</b>  <i>Special Purposes Enclosures</i></p>
<p><b>Intended Use and Description</b></p> <p>Enclosures are constructed to protect against specific environmental conditions, as well as accidental contact with the equipment enclosed within.</p>
<p><b>Type 1</b> - (There is no CSA equivalent.)</p>
<p><b>Type 2</b> - Enclosures are designed to provide protection, primarily indoors, against dripping and small amounts of splashing of non-corrosive liquids, and dirt.</p>
<p><b>Type 3</b> - Enclosures, designed for both indoor and outdoor use, protect against rain and snow, and remain undamaged by the external formation of ice.</p>
<p><b>Type 3R</b> - Enclosures used both indoors and out for protection against rain and snow, remaining undamaged by exterior ice formation.</p>
<p><b>Type 3S</b> - Enclosures used both indoors and out for protection against rain, snow, and airborne dust, and enable external mechanisms to operate efficiently even when ice laden.</p>
<p><b>Type 4</b> - Enclosures used both indoors and out for protection against rain, snow, airborne dust, and both splashing and hose-directed water, remaining undamaged by exterior ice.</p>

## Enclosure Type Cross Reference: NEMA/UL/CSA

(con't) NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION <i>NEMA Standards Publication No. 250-1991, Enclosures for Electrical Equipment (1000V max.)</i>
<p><b>Intended Use and Description</b></p> <p><b>Type 4X</b> - Enclosures used both indoors and out to protect against corrosion, wind-blown dust and rain, splashing or hose-directed water, and damage caused by exterior ice formation.</p>
<p><b>Type 5</b> - Enclosures used primarily indoors to provide protection against airborne dust and dirt, and non-corrosive liquids.</p>
<p><b>Type 6</b> - Enclosures provide protection both indoors and out against hose-directed water, water entry during occasional short-term submersion at low-pressure depths, and damage caused by exterior ice formation.</p>
<p><b>Type 6P</b> - Enclosures protect both indoors and out against hose-directed water, water entry during long-term submersion at low-pressure depths, and ice damage.</p>
<p><b>Type 12</b> - Enclosures used primarily indoors to protect against airborne dust or dirt, and non-corrosive liquids.</p>
<p><b>Type 12K</b> - Enclosures with knockouts are used primarily indoors for protection against airborne dust and dirt, and non-corrosive liquids.</p>
<p><b>Type 13</b> - Enclosures used primarily indoors to protect against dust, as well as accidental spraying by water, oil, or non-corrosive coolants.</p>

(con't) UNDERWRITERS LABORATORIES UL50 <i>Standard for Enclosures for Electrical Equipment (10th Edition)</i>
<p><b>Intended Use and Description</b></p> <p><b>Type 4X</b> - For protection indoors and out from corrosion, wind-blown dust and rain, splashing or hose-directed water, and damage caused by exterior ice formation.</p>
<p><b>Type 5</b> - Used primarily indoors for protection against airborne dust or dirt, and non-corrosive liquids.</p>
<p><b>Type 6</b> - For protection indoors and out against hose-directed water, water entry during occasional short-term submersion at low-pressure depths, and damage caused by exterior ice formation.</p>
<p><b>Type 6P</b> - For protection indoors and out against hose-directed water, water entry during long-term submersion at low-pressure depths, and damage caused by exterior ice formation.</p>
<p><b>Type 12</b> - Used primarily indoors to protect against airborne dust and dirt, and non-corrosive liquids.</p>
<p><b>Type 12K</b> - Used primarily indoors to protect against dust and dirt, and non-corrosive liquids.</p>
<p><b>Type 13</b> - Used primarily indoors to protect against dust, as well as accidental spraying by water, oil, or non-corrosive coolants.</p>

(con't) CANADIAN STANDARDS ASSOCIATION <i>CAN/CSA C22.2 No. 94-M91 Special Purposes Enclosures</i>
<p><b>Intended Use and Description</b></p> <p><b>Type 4X</b> - Enclosures used both indoors and out for protection against rain, snow, airborne dust, and both splashing and hose-directed water, remaining undamaged by exterior ice formation.</p>
<p><b>Type 5</b> - Enclosures exclusively for indoor use, providing protection against dripping and light splashing of non-corrosive liquids, as well as airborne dust, lint, fibers, and filings.</p>
<p><b>Type 6</b> - Enclosures used both indoors and out for protection against water entry during occasional short-term submersion at low-pressure depths, remaining undamaged by exterior ice formation.</p>
<p><b>Type 6P</b> - Enclosures for use both indoors and out for protection against water entry during long-term submersion at low-pressure depths. In addition, it provides corrosion resistance over extended periods of time and remains undamaged by exterior ice formation.</p>
<p><b>Type 12</b> - Enclosures exclusively for indoor use, providing protection against airborne dust, lint, fibers, and filings, as well as dripping and light splashing of non-corrosive liquids. These enclosures are not provided with knockouts.</p>
<p><b>Type 12K</b> - Enclosures provided with knockouts and used exclusively indoors for protection against airborne dust, lint, fibers, and filings, as well as dripping and light splashing of non-corrosive liquids.</p>
<p><b>Type 13</b> - Enclosures exclusively for indoor use, providing protection against airborne dust, lint, fibers, and filings, as well as from seepage and spraying of non-corrosive liquids, including oils and coolants.</p>