

## NEMA Enclosure Descriptions

### NEMA Standard Publications No. 250-1979

#### Type 1

Type 1 enclosures are intended for indoor use primarily to provide a degree of protection against contact with the enclosed equipment in locations where unusual service conditions do not exist. The enclosures shall meet the rod entry and rust resistance design tests.

#### Type 3

Type 3 enclosures are intended for outdoor use, primarily to provide a degree of protection against windblown dust, rain and sleet, and to be undamaged by the formation of ice on the enclosure. They shall meet rain, external icing, dust, and rust resistance design tests. They are not intended to provide protection against conditions such as internal condensation or internal icing.

#### Type 3R

Type 3R enclosures are intended for outdoor use, primarily to provide a degree of protection against falling rain, and to be undamaged by the formation of ice on the enclosure. They shall meet rod entry, rain, external icing, and rust resistance design tests. They are not intended to provide protection against conditions such as dust, internal condensation, or internal icing.

#### Type 4

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, and to be undamaged by the formation of ice on the enclosure. They shall meet hosedown, external icing, and rust resistance design tests. They are not intended to provide protection against conditions such as internal condensation or internal icing.

#### Type 4X

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, and to be undamaged by the formation of ice on the enclosure. They shall meet hosedown, external icing, and corrosion resistance

design tests. They are not intended to provide protection against conditions such as internal condensation or internal icing.

Shall be manufactured of American Iron and Steel Institute Type 304 Stainless steel, polymerics, or materials with equivalent corrosion resistance to provide a degree of protection against specific corrosive agents.

#### Type 6

Type 6 enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against the entry of water during occasional temporary submersion at a limited depth.

Type 6P enclosures are 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.

#### Type 7

Type 7 enclosures are for indoor use in locations classified as Class I, Groups C or D, as defined in the National Electrical Code.

Type 7 enclosures shall be capable of withstanding the pressures resulting from an internal explosion of specified gases and contain such an explosion sufficiently that an explosive gas-air mixture existing in the atmosphere surrounding the enclosure will not be ignited. Enclosed heat generating devices shall not cause external surfaces to reach temperatures capable of igniting explosive gas-air mixtures in the surrounding atmosphere. Enclosures shall meet explosion, hydrostatic, and temperature design tests.

#### Type 9

Type 9 enclosures are intended for indoor use in locations classified as Class II Groups E, F or G, as defined in the National Electrical Code.

Type 9 enclosures shall be capable of preventing the entrance of dust. Enclosed heat generating devices shall not cause external surfaces to reach temperatures capable of igniting or discoloring dust on the enclosure or igniting dust-air mixtures in the surrounding atmosphere. Enclosures shall meet dust penetration and temperature design tests, and aging of gaskets (if used).

**Class I**—Flammable gases or vapors.

**Class II**—Combustible dust.

**Class III**—Ignitable fibers or flyings.

**Division I**—Normal situation; the hazard would be expected to be present in everyday repair and maintenance.

**Division II**—Abnormal situation; the material is expected to be confined within closed containers or closed systems and will be present only during accidental rupture, breakage or unusual faulty operation.

#### Groups

**Class I**—Gases and vapors are designed for use in groups C and D, depending on the ignition temperature of the substance, its explosion pressure and other flammable characteristics.

**Class II**—Dust locations are designed for use in groups E, F, and G, according to the ignition temperature and conductivity of the hazardous substance.

#### Type 12

Type 12 enclosures are intended for indoor use primarily to provide a degree of protection against dust, falling dirt, and dripping non-corrosive liquids. They shall meet drip, dust, and rust resistance design tests. They are not intended to provide protection against conditions such as internal condensation.

Siemens NEMA 12 may be field modified for outdoor use. NEMA 3 requires the use of watertight conduit hubs. NEMA 3R requires the use of watertight conduit hubs at a level above the lowest live part and drain holes of 1/8" diameter shall be added at the bottom of the enclosure.

#### Type 13

Type 13 enclosures are intended for indoor use primarily to provide a degree of protection against dust, spraying of water, oil and non-corrosive coolant. They shall meet oil explosion and rust resistance design tests. They are not intended to provide protection against conditions such as internal condensation.



Type 1



Type 3/3R



Type 4/4X



Type 4X



Type 3, 4, 7 & 9



Type 12 & 13