



TECH TIP #53

DELTA CONTROLS CORPORATION

HOUSING AND ENCLOSURE RATING INFORMATION RATINGS SHOWN ARE STANDARDS OF THE NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION

- CLASS 1 GENERAL PURPOSE**
For indoor use only, primarily utilized as protection against contact with the enclosed circuits. Commonly used on panel mounted recorded, meters, etc.
- CLASS 3 WEATHER RESISTANT**
(also known as "Weatherproof", "Splashproof", "Sleetproof") For outdoor use; protects enclosed components from wind-blown dust, rain, sleet and external icing. This enclosure is usually inadequate for protecting modern electronic instrumentation.
- CLASS 4 WATERTIGHT (also known as "Hoseproof")**
Similar to "3" above; but also passes the "Hose Test", which is described as: a 1 inch nozzle, delivering 65 gpm of water, from a distance of 10 feet, from all directions, for a 5 minute time period, no water leak to the interior is allowed. This enclosure is the one of choice for most general outdoor applications.
- CLASS 4X WATERTIGHT**
Same as "4" above; also constructed of corrosion resistant materials suitable for the corrosive conditions of the installed location. The generally preferred materials are polyester/glass, stainless steel, and epoxy coatings. This enclosure is the "standard" for protecting today's plant instrumentation.
- CLASS 6 SUBMERSIBLE**
Used for protection against temporary submergence to limited depths (a 15-foot spec is common). These enclosures should also be rated NEMA 4X for conditions at the installation site. Typical uses are in manholes, quarries, mines, etc.
- CLASS 7 EXPLOSIONPROOF (GASES)**
CLASS I is a location with an atmospheric mixture of flammable gases. The enclosure is intended to contain an explosion internally while the surrounding ambient gas-air mixture is not ignited. These enclosures should also be rated NEMA 4 so as to be suitable for instrument service.
- DIVISION I** is a location in which hazardous mixtures are expected during normal operations.
- DIVISION II** is a location in which the flammables are contained and escape only during a system rupture.
- GROUP A:** acetylene
GROUP B: hydrogen, manufactured gas or equivalent
GROUP C: ethyl ether, ethylene, cyclopropane, or equivalent
GROUP D: gasoline, hexane, naphtha, butane, alcohol, acetone, lacquer solvents, natural gas, and equivalents.
Commonly used by oil refineries, petrochemical plants and sewage treatment plants.
- CLASS 9 EXPLOSION PROOF (DUSTS)**
CLASS II is a location hazardous because of combustible dusts. The enclosure excludes the dust from the internal power sources and ignition is thereby prevented. It also must not overheat when covered by a layer of the dust.
- DIVISION I** locations are where suspended combustible dusts are expected during normal operations.
DIVISION II locations are where normal operations cannot put the dust into atmospheric suspension.
- GROUP E:** Metal dusts, electrically conductive, such as those of aluminum, magnesium, and their alloys.
GROUP F: Other dusts, electrically conductive, such as those of carbon black, coal, and coke.
GROUP G: Dusts such as those of grain, flour, and starch.
- CLASS 12 INDUSTRIAL USE**
Intended for indoor use; provides protection against dust and dripping liquids; used in machine shops, etc.
- CLASS 13 INDUSTRIAL USE**
Similar to "12" above, but also provides protection against spraying oil, water, coolant, etc. Used for enhanced protection of electronic instruments in manufacturing plants and similar environments.

NOTE: The above information is intended only to generally describe the enclosures commonly used in our industry. Detailed rules and application information can be found in the current National Electrical code and in other governing authority publications; these must be followed for specific installations.