

# CTC AppNotes

A series of technical documents written by members of the CTC community

## Hazardous Area Classifications: What they are and why they are important

Due to increased concerns for worker safety, hazardous rated areas are becoming more prominent on the radar of many professional vibration analysts. In North America, CSA standards are one of the common sets of standards applied. In the CSA standards, areas where hazardous materials may be present are sorted by "Class", "Division" and "Group".

Classes separate the types of material present in the surrounding atmosphere.

Class I—flammable gases or vapors are present in the air in quantities sufficient to produce explosive or ignitable mixtures.

Class II— combustible or conductive dusts are present in sufficient concentrations to be explosive or ignitable.

Class III— ignitable fibers or flying's are present, but not likely to be in suspension in sufficient quantities to produce ignitable mixtures. Typical wood chips, cotton, flax and nylon. Group classifications are not applied to this class

Divisions define the probability that the hazardous material is present in dangerous concentrations.

Division 1—The hazardous substance is present during normal operational conditions.

Division 2— The hazardous substance is present only in abnormal conditions, such as a container failure or system breakdown.

Group defines the type of hazardous material that can be present in the surrounding atmosphere.



Figure 1— Hazardous ratings exist to help prevent explosions like this one.

Group A—Acetylene.

Group B—Hydrogen, fuel and combustible process gases containing more than 30% hydrogen by volume or gases of equivalent hazard such as butadiene, ethylene, oxide, propylene oxide and acrolein.

Group C—Hydrogen sulfide, carbon monoxide, cyclopropane, morphine, ether, ethyl

and ethylene, or gases of equivalent hazard.

Group D—Gasoline, acetone, ammonia, benzene, butane, cyclopropane, ethanol, hexane, methanol, methane, vinyl chloride, natural gas, naphtha, propane or gases of equivalent hazard.

Group E—Combustible metal dusts, including aluminum, magnesium and their commercial alloys or other combustible dusts whose particle size, abrasiveness and conductivity present similar hazards in connection with electrical equipment.



Figure 2 — AC980-1D sensor is rated for use in Division 1 in both Class I and Class II . Note the engraved logos for all the intrinsic safety approvals.

Group F—Carbonaceous dusts, carbon black, coal black, charcoal, coal or coke dusts that have more than 8% total entrapped volatiles or dusts that have been sensitized by other material so they present an explosion hazard.

Group G—Flour dust, grain dust, flour, starch, sugar, wood, plastic and chemicals.

All of CTC's sensors rated for hazardous areas have their rating information engraved on the sensor body itself. In order to incorporate as much information as possible on the face of the sensor, the ratings are shown along with sufficient information to identify the control drawing that details proper installation information.

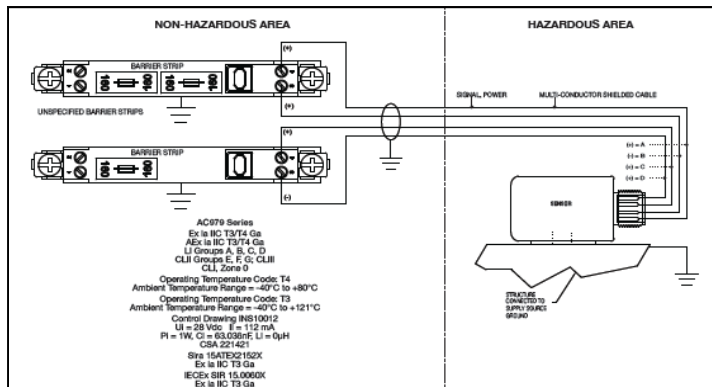


Figure 3— Sample of the control drawing for AC980-1D Intrinsically Safe triaxial sensor.

If you have any questions or for further information feel free to contact CTC via Email [techsupport@ctconline.com](mailto:techsupport@ctconline.com) or call 1-800-999-5290 in the US and Canada or +1-585-924-5900 internationally.