

# ***HAZARDOUS AREA CLASSIFICATIONS EXPLAINED***



**WHEN RELIABILITY MATTERS  
CONNECT TO CONFIDENCE**

**HAZARDOUS AREA CLASSIFICATIONS :**  
**WHAT ARE THEY, AND WHY ARE THEY 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 most common sets of standards applied to comply with CEC and NEC (NFPA 70) regulations. In the North American division scheme, areas where hazardous materials may be present are sorted by **Class**, **Division**, and **Group**.



*Hazardous ratings exist to help prevent catastrophic incidents like this one*

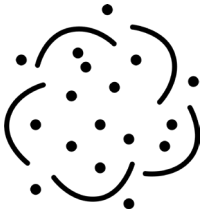
## CLASSES

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



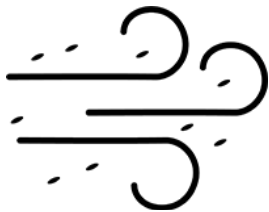
### CLASS I

*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 quantities to be explosive or ignitable.*

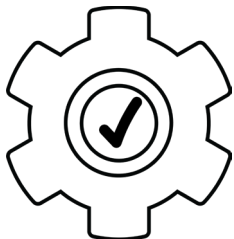


### CLASS III

*Ignitable fibers or flyings are present, but not likely to be in suspension in sufficient quantities to produce ignitable mixtures. Typically wood chips, cotton, flax, and nylon. Group classifications are not applied to this class.*

## DIVISIONS

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



### DIVISION 1

*The hazardous substance is present during normal operational conditions.*

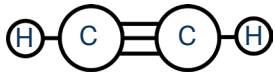


### DIVISION 2

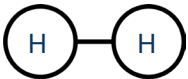
*The hazardous substance is present only in abnormal conditions, such as a container failure or system breakdown.*

## GROUPS

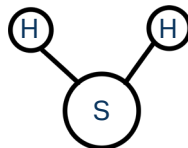
Groups define the type of hazardous material that can be present in the surrounding atmosphere.



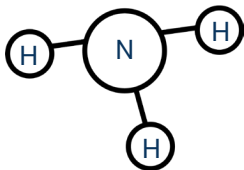
**GROUP A**  
*Acetylene*



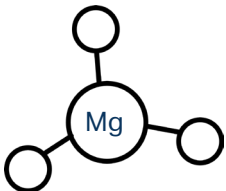
**GROUP B**  
*Hydrogen, fuel, and combustible process gases containing more than 30% hydrogen by volume or gases of equivalent hazard, such as butadiene, ethylene, oxide, and acrolein.*



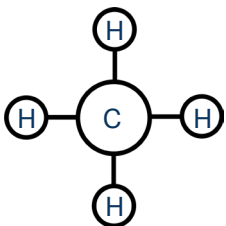
**GROUP C**  
*Hydrogen sulfide, carbon monoxide, cyclopropane, morpoline, ether, ethyl, ethylene, or gases of equivalent hazard.*



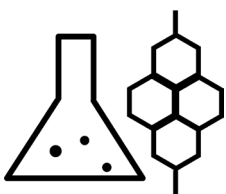
**GROUP D**  
*Gasoline, acetone, ammonia, benzene, butane, cyclopropane, ethanol, hexane, methanol, methane, vinyl chloride, natural gas, naphtha, propane, or gases of equivalent hazard.*



**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.*



**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.*



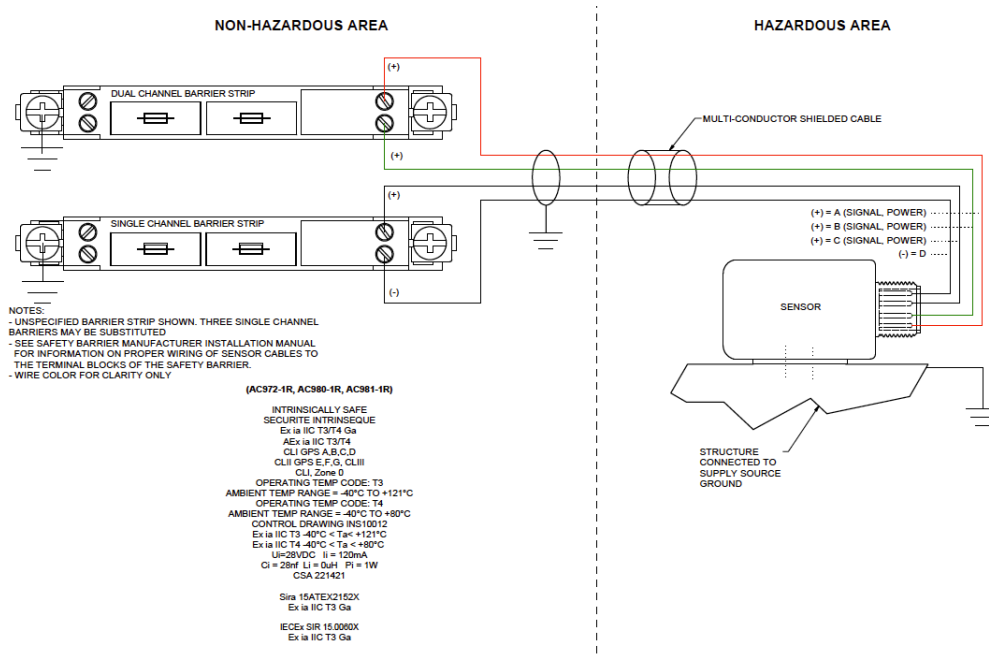
**GROUP G**  
*Flour dust, grain dust, flour, starch, sugar, wood, plastic, and chemicals.*

All of CTC's sensors rated for hazardous areas have their own rating information engraved on the sensor body itself.



AC980-1D is rated for use in Division 1 in Class I, Class II and Class III. Note the engraved logos for all of the intrinsic safety approvals.

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.



Sample of the control drawing for AC980-1D Intrinsically Safe triaxial sensor