

**WILSON•HURD®****PIEZOPANEL® - INTRINSIC SAFETY**

**U**tilizing electricity in areas that are potentially explosive is a great concern of many industries. Intrinsically safe equipment limits the thermal and electrical energy to so that ignition is not a possibility.

Below are a few basic definitions explaining the difference between the types of intrinsically safe systems. Should you have any additional questions or concerns please contact our Engineering Department at 715-845-9221.

#### Definitions

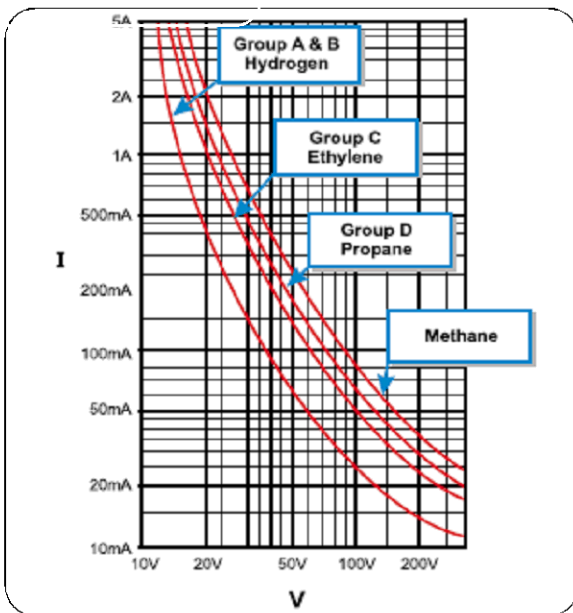
- **Intrinsically Safe** - The practice of safely lowering the voltage and amps used in a hazardous area.
- **Intrinsically Safe Circuit** - An intrinsically safe circuit is designed so that a spark or other thermal effect will not cause ignition when placed in a flammable environment where combustible materials are present. However, if the switch is utilized under different conditions

than what it was designed for, accidental explosion may occur.

- **Intrinsically Safe System** - A safe system is consists of an intrinsically safe apparatus assembled using interconnecting cables and also contains intrinsically safe circuits.

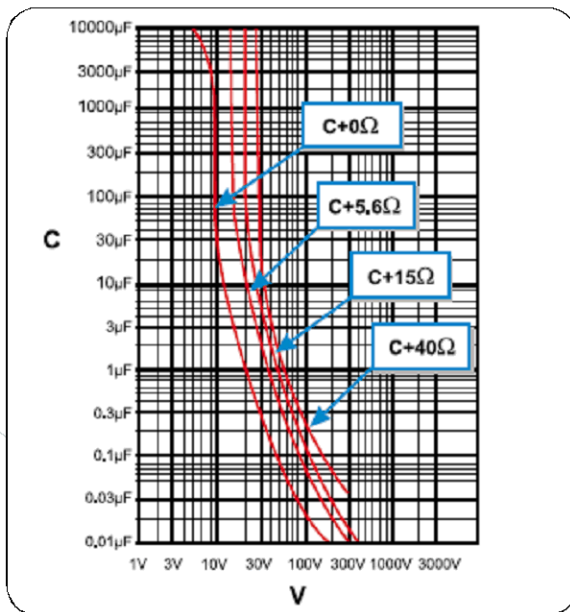
**\*\*NOTE:** Wilson-Hurd's PiezoPanels are intrinsically safe; however, the addition of other electronic components and circuitry could easily cause the panels to be unsafe in potentially explosive environments. Each PiezoPanel is custom designed according to our customers specifications. Since the PiezoPanel is only a component of the entire assembly, it is the responsibility of our customers to test the complete assembly prior to placing it in the environment in which it will be operated to ensure that it level of intrinsic safety.

Please refer to page two (2) of this bulletin for graphs illustrating intrinsic safety for resistance, capacitance, and inductance.



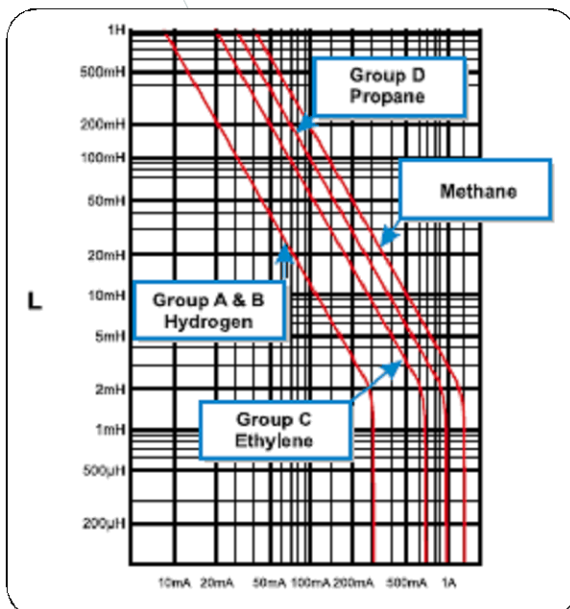
Resistance Circuits

This graph illustrates the voltage to current relationship (ignition curve) for all circuit metals. The vertical axis shows the current and the horizontal axis the voltage. To be safe, the voltage and current must fall to the left of the red curve since the curve represents the ignition point. At 2 volts the PiezoPanel generates 14 micro amps which falls well below all ignition points illustrated here.



Capacitance Circuits

The relationship between capacitance and voltage for hydrogen (Group A and Group B) and their ignition points are illustrated by this graph. In order to be safe in its environment all circuits must fall below and to the left of the curve. Wilson-Hurd's PiezoPanel generates only 1 micro farad at 2 volts, making ours perfectly safe to operate in this type of environment.



Inductance Circuitry:

The opening and closing of a circuit can release stored energy; potentially causing ignition in certain environments. This graph illustrates the relationship between inductance and current. At 100 micro henry the PiezoPanel does not generate a measurable current; therefore, there is no risk of ignition.