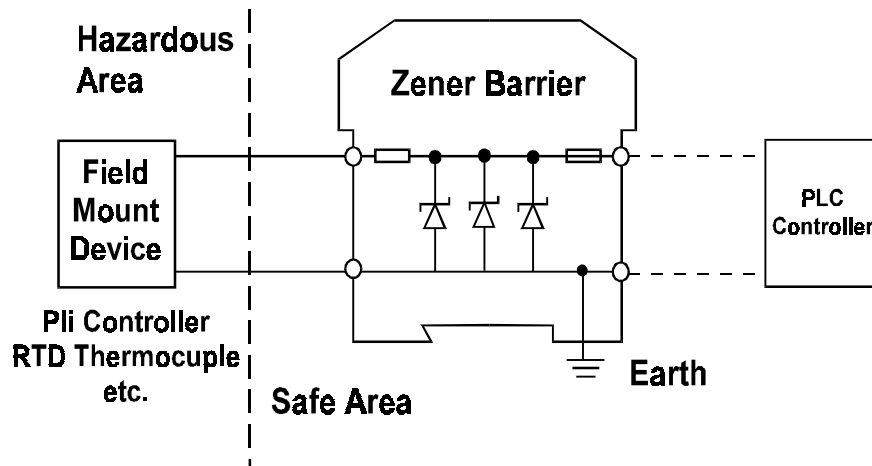


## Introduction of Zener Barriers

The typical zener barrier offers a galvanic connection between the mounted devices such as p/I converters, RTDs, PT 100, Thermocouples in the flammable hazardous area etc and the instrumentation circuits outside the hazardous area.

It is therefore necessary to limit the maximum value of the current with the help of a resistor and a fuse. This results in a natural voltage drop inside the barrier, sometimes not allowing sufficient voltage to drive a transmitter, especially if long cable lengths have to be connected between the transmitter and the zener barrier !



It is also necessary to limit the value of the voltage which could appear at the terminals of the hazardous area. This is done with the help of zener diodes connected in the reverse polarity mode.

In the case of the 24 V DC power supply voltage exceeding the "Knee voltage " of the zener diodes, a large current sets in which flows through the fuse into the earth, thereby making the zener barrier non conductive (it must be replaced now).

However for the user, the three under mentioned major problem areas require careful monitoring:

- The earthing pit must be very conductive, ie it must not ever show a earth resistance of more than 1 Ohm, [could be very troublesome in the summer months in India]
- The 24V DC control supply voltage must be very stable. It should not allow more than 26.3V DC to be offered to the barrier,[ could also be very difficult to manage, in the night hours when other loads are switched off] !
- No field mounted device may be earthed, as circulatory currents shall flow between the two earths, one of the field mounted device and the zener barrier earthing.

Modern trends in the design of hazardous area instrumentation call for a minimum down time to replace interface units

Please visit the Osna website at [www.osnaelectronics.com](http://www.osnaelectronics.com) for an introduction to galvanic isolators..

Please see OSNA application notes on :

- OS System Isolators using draw out terminals.
- OBS System Isolators using a Back Plane system ( similar to computer mother board connector system).

Related OSNA application notes are available on below subjects :

- Selection of PTB certified interfaces for intrinsic safe power supplies for transmitters.
- Selection of an interface for an active 4-20 mA current/current repeater