

# Zener Safety Barrier Application Guide

## Background

TraceTek alarm and locating modules carry a variety of approvals, including Underwriters' Laboratory, Inc.(UL), Canadian Standards Association (CSA) and FM Approvals (FM), for use in ordinary areas. Some TraceTek alarm and locating modules are approved for installation in hazardous locations (refer to module data sheets for details). However, when the sensing cable is to be installed in a hazardous area, particularly Class I Division 1 or Zone 0/1 locations, a protective device such as a zener safety barrier may be required between the alarm module and the sensing cable that it monitors. (The TTG and TTA alarm modules are approved for use with cables in Class I Division 1 areas without additional zener barriers.)

The safety barrier assures that, even if the TraceTek module suffers a multiple failure, the energy transferred to the sensing cable (and thus to the hazardous area) will remain below explosive ignition levels, thus reducing the risk of fire or explosion.

Because the TraceTek system uses very low voltage and current levels, and because the sensing cable is a simple passive device, readily available commercial safety barriers can accomplish the required isolation.

## Application Specifics

Several manufacturers produce zener safety barriers. TraceTek has standardized on the MTL-7167+ model manufactured by MTL Incorporated, which is approved and certified by UL, CSA, FM, BAAEFPA and other agencies.

Each MTL-7167+ barrier is capable of isolating two wires. Because the TraceTek circuit requires four wires to connect the alarm module to the sensing cable, two of the MTL-7167+ barriers are necessary. The barriers can be purchased from TraceTek with the following catalog numbers:

TT-ZENER-BARRIER-DIN	Two MTL-7167 barriers
TT-ZENER-BARRIER-KIT	Two zener barriers, plus an enclosure, DIN rail and ground terminals

## Impact on TraceTek System Performance

During all expected modes of TraceTek operation (normal monitoring, leak detection or cable break) each of the four barrier channels appears as a 135-ohm resistor in series between the alarm module and the sensing cable. This has two implications for the performance of the TraceTek system:

1. The MTL barrier will add 11 meters to the effective length of the TraceTek sensor cable. All mapped distances and actual leak locations (locating alarm units only) will be affected by the presence of the barrier. The additional length should also be taken into consideration when determining circuit lengths.

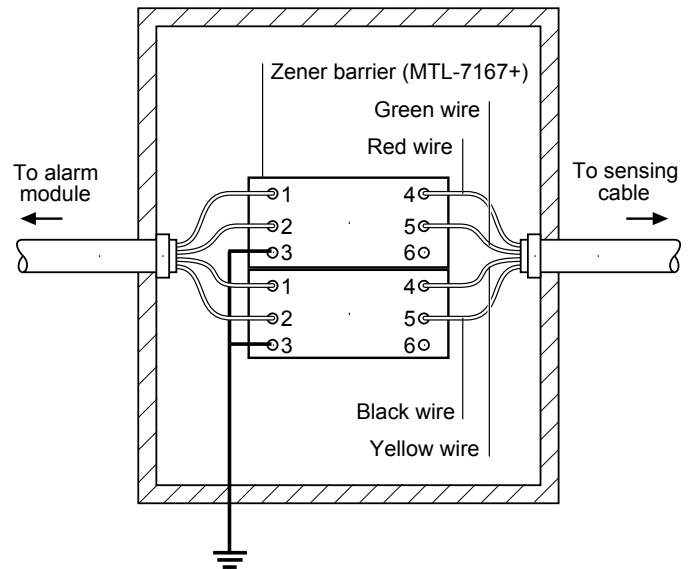
2. On locating alarm units, the cable test length readout, will show a reading of about 21 meters more than it would have if the zener barrier were not installed. For instance, if 150 meters of actual sensing cable is installed, the cable test length readout will show approximately 171 meters or slightly more. The additional 21 meters added to the test length readout is a good indication that the zener barrier is correctly installed. Refer to the locating module's operating instructions for details regarding adjustments to compensate for the barrier resistance.

## Other Applications

Review the alarm/locating module data sheets and installation instructions for specific information regarding each module's hazardous area ratings and approvals. If the existing approval is not acceptable to the local authorities, MTL-7167+ zener safety barriers can be installed with any TraceTek module as an extra precaution.

## Installation and Wiring

Below is a typical wiring diagram for using MTL-7167+ barriers with TraceTek alarm and location modules. Please refer to the specific data sheets and installation instructions of the module you are installing for further details.



Note: Hazardous Area approvals are carried by the barrier manufacturer. In order to achieve the necessary level of protection, the barrier manufacturer's instructions must be followed exactly.

## Tyco Thermal Controls

300 Constitution Drive  
Menlo Park, CA 94025-1164  
USA

Tel: (800) 545-6258  
Fax: (650) 474-7215  
E-mail: [info@tycothermal.com](mailto:info@tycothermal.com)  
[www.tracetek.com](http://www.tracetek.com)

Important: All information, including illustrations, is believed to be reliable. Users, however, should independently evaluate the suitability of each product for their application. Tyco Thermal Controls makes no warranty as to the accuracy or completeness of the information, and disclaims any liability regarding its use. Tyco Thermal Controls only obligations are those in the Tyco Thermal Controls Standard Terms and Conditions of Sale for this product, and in no case will Tyco Thermal Controls or its distributors be liable for any incidental, indirect, or consequential damages arising from the sale, resale, use or misuse of the product. Specifications are subject to change without notice. In addition, Tyco Thermal Controls reserves the right to make changes – without notification to Buyer – to processing or materials that do not affect compliance with any applicable specification.

TraceTek and Tyco are trademarks of Tyco Thermal Controls or its affiliates.