HOCHIKI

TECHNOLOGY GUIDE

INTRINSICALLY SAFE FIRE DETECTION

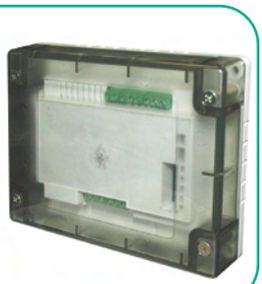
SLR-E-IS Photoelectric Smoke Detector

- Certified by BASEEFA to *II 1G EEx ia IIC T5 (-20°C<Ta<55°C)*
- LPCB Approved to EN54-7
- Removable, High Performance Chamber technology
- Supported by a wide range of barriers
- Twin fire LED's allow 360° viewing
- Electronics-free mounting base
- Remote indicator output
- Suitable for installation in areas at **Category 1, 2 or 3**

DCD-1E-IS Combined Heat Detector

- Certified by BASEEFA to **II 1G EEx ia IIC T5 Tamb=55°C**
- LPCB Approved to EN54-5
- Supported by a wide range of barriers
- Twin fire LED's allow 360° viewing
- Electronics-free mounting base
- Remote indicator output
- Suitable for installation in areas at **Category 1, 2 or 3**

CHQ-DZM(IS) Dual Zone Module



- Allows I.S. detectors to be connected to analogue system loop
- Single Loop Address
- Requires auxiliary 24Vdc Supply
- Supports Two Independent Zones of Hochiki I.S. Conventional Detectors
- Both Zones Fully Monitored for Short/Open Circuit
- Fitted in SAFE area
- Supplied with appropriately rated end-of-line resistors

The purpose of specifying I.S. Fire Detection equipment within hazardous areas is to prevent the occurence of a fire or an explosion from the operation of that equipment. To be able to achieve this intrinsic safety, all products that are installed within a hazardous area should be designed such that they cannot store sufficient energy to create a spark or reach a surface temperature, even when faulty, to ignite the hazardous material being stored or processed.

Within the UK this requirement is tested by an independent third party, for example, EECS. This requirement also applies to any cabling entering into the hazardous area, regardless if it's for a zone of detectors or a sounder circuit. This is why a Zener barrier or Galvanic isolator must be used in conjunction with I.S Products to limit the energy entering the hazardous area.

Hazardous Areas

What constitutes a hazardous area can be difficult to determine for the Fire Installation company; close evaluation and consultation on the site must take place to identify potential hazards.

Many industrial processes produce hazardous environments such as Chemical plants, Paint factories and other processes that involve chemical mixing.

A hazardous area is defined by the ATEX Directive (from July 1st 2003) as being in one of three categories:

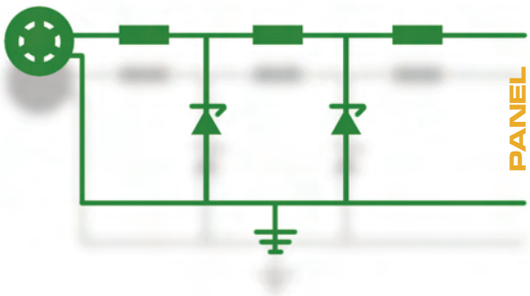
Category Classification for Gas (ATEX)

Category 1 - where flammable atmospheres are present continuously or more than 1000 hours annually.

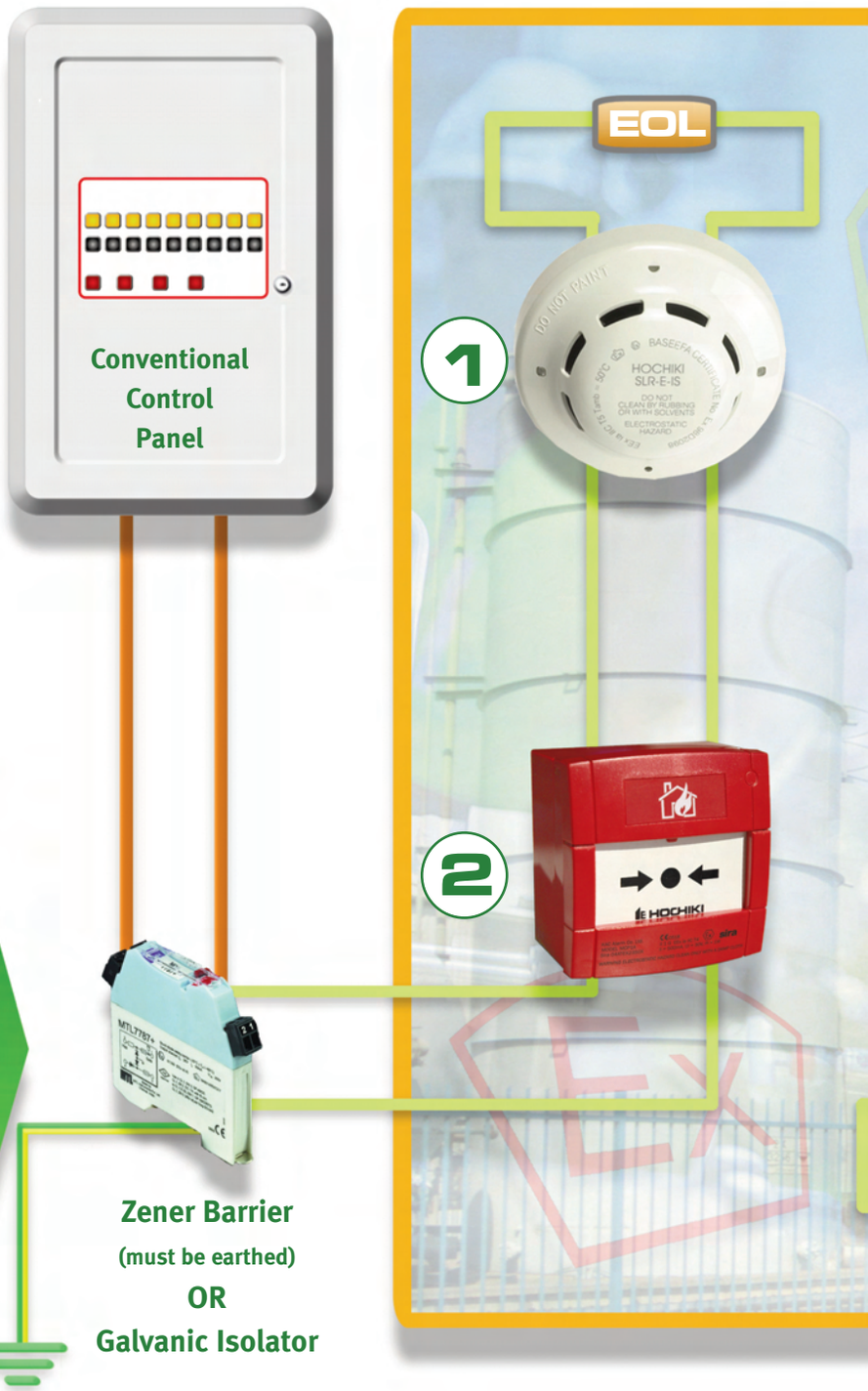
Category 2 - where flammable atmospheres are present intermittently or more than 10 but less than 1000 hours annually.

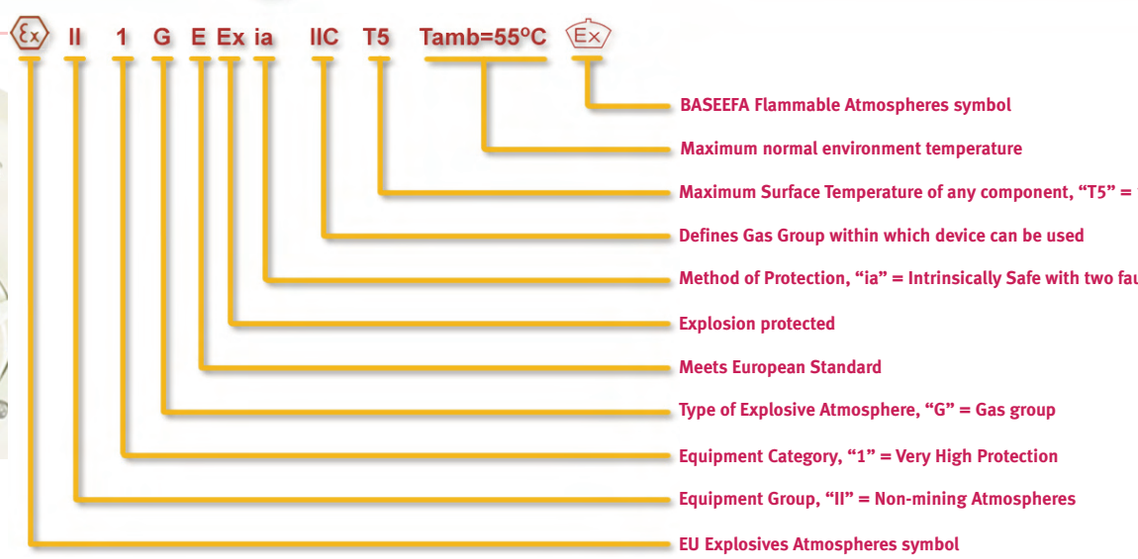
Category 3 - where flammable atmospheres are present abnormally - less than 10 hours annually.

MTL7787+ Zener Barrier



The **Zener Barrier** is a relatively simple device, the technique employed to reduce the amount of energy entering the hazardous area is the limiting of the voltage and current using resistors and zener diodes. Zener Barriers require earthing in accordance with standards (typically <1 ohm to main building earth point).





OUS AREA

MTL5561 Galvanic Isolator

Galvanic Isolator
ONLY

2

1

EOL

HOCHIKI ESP COMPATIBLE

The **Galvanic Isolator** provides electrical isolation via an isolating transformer, this negates the need for a separate earth connection. This isolation technique limits the power to the detectors within the hazardous area by using this transformer. Although this type of product is more expensive, overall the installation costs are generally lower. Safety is improved as there is no risk of an earth connection being lost.

Hochiki's Intrinsically Safe detectors have been certified by BASEEFA under the new ATEX directive which will become mandatory as of the 1st July 2003. This directive changes the classification for the risk areas into categories and also changes the bias to prevent explosive atmospheres (EN 1127-1). The certification marking of Hochiki's DCD-1E-IS Heat Detector and SLR-E-IS Photolectric Smoke Detector is shown left with an explanation of each part.

T5" = 100°C

wo faults

1 Up to 20 INTRINSICALLY SAFE Detectors (SLR-E-IS or DCD-1E-IS)

2 Unlimited number of INTRINSICALLY SAFE Manual Call Points (CCP-E-IS) (always first on the zone)

EOL To ensure that the surface temperature of the resistor remains below that of the flash-point of the hazardous material present it is certified that the overall surface area must be greater than 230mm².

LOOP

SAFE AREA ZONE CIRCUIT

HAZARDOUS AREA ZONE CIRCUIT

AUXILIARY POWER (24VDC)

MTL5561
Galvanic Isolator

- Simple installation onto standard DIN railing
- Easy maintenance using plug-in connectors
- Input circuit protected against reverse polarity

MTL7787+
Zener Barrier

- Simple installation onto standard DIN railing
- Removable colour-coded terminals for easy connection, accommodate conductors up to 2.5mm^2
- Supports up to two zones of I.S. products
- Electronic fusing

CCP-E-IS
Manual Call Point

- Supports either a 'Frangible Glass' element or a 'Non Frangible Plastic' element
- Wiring terminals can accommodate up to a 2.5 mm^2 solid conductor
- Approved to BS5839 Part 2
- Rugged design

YBN-R/4(IS)
Base

- Dedicated cable screen terminal
- Accepts from 1 to 2.5mm^2 cables
- Quick connection via square cable clamps
- Electronics free

Approvals

It is a clear requirement that all equipment installed within a hazardous area must be certified by a third party, this is to ensure that it will not cause any sparks or surface heat capable of causing the hazardous material to ignite. It is recommended that all equipment installed should be approved to EN54 parts 5 and 7, for heat and smoke performance respectively.

Within the UK the main independent approval bodies for testing to the European standards (EN54) are the Loss Prevention Certification Board (LPCB) and The British Standards Institute (BSI).

Installation

Apart from selecting and installing good quality third party approved equipment such as Hochiki's conventional I.S. range of detectors, a number of safety precautions need to be considered. This is especially important in Category 1, where no tools should be used that could cause a spark. In Categories 2 and 3 tools can be used that create a single spark, as they typically do not have sufficient energy to ignite the Gas within the area. In any of the Categories tools such as electric drills, which produce a continuous stream of sparks, should not be used and even multi-meters should be rated for I.S. use with appropriate certification.

A consideration which is often forgotten is "Static Electricity" as this can produce high voltage discharges in the 20,000V range. So every precaution should be taken to prevent static build-up such as the use of anti-static 'wrist straps' or 'ankle straps' that can provide a safe connection to the earth potential.

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Quality System
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Assessed to ISO9001

Environmental Management System
Certificate No. EMS 286
Assessed to ISO 14001 : 1996