

## A complete fire detection solution.

**Atmospheric Storage Tanks are used to store highly flammable products which makes them susceptible to major fires causing catastrophic damage.**

The main cause for these fires are due to worn or damaged rim seals on the Floating Roof of the tanks. Linear Heat Detection Cable (LHDC) is a key component of the fire detection system.

LHDC can be used as a stand alone detection system or as an activation for a suppression system to protect the tanks from catastrophic damage.

Designs of tanks can differ significantly amongst manufactures and site needs, LHDC is flexible enough to accommodate these differences; providing an affective system.

### Key System Features

- Intrinsically safe operation by using certified IS Barriers / Isolators.
- Rim Seal Fire Detection with LHDC.
- Automated Cable Reeler or Retractable cables.
- Key switch mounted outside the Tank for Fire and Fault routine maintenance testing.

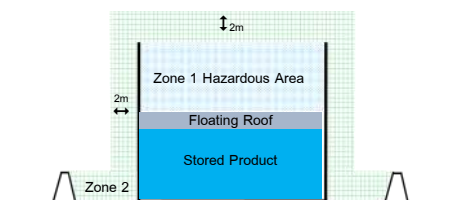
**Intrinsic safety (IS)** is a protection technique for safe operation of electronic equipment in explosive atmospheres by using IS Barriers.



**Intrinsically Safe Barrier**

The theory behind intrinsic safety is to ensure that the available electrical and thermal energy in the system is always low enough that ignition of the hazardous atmosphere cannot occur.

IS Barriers provide protection to enable equipment to be used in Hazardous areas classified as Zone 0



“Simple apparatus” is defined in clause 5.4 of BS EN 50020:2002- 'Electrical apparatus for potentially explosive atmospheres - Intrinsic safety 'IS'.

A “simple apparatus” device does not generate or store more than the following:

- An inductance not greater than 10mH and a capacitance not greater than 5nF.

A “Simple apparatus” device **does not** need certification from a notified body.

Even though a device is considered a “simple apparatus” device, it must be connected to an Intrinsic Safety barrier.

Examples of “simple apparatus” are:

### Discrete Switch Inputs

- Digital Linear Heat Detection Cable
- Pressure Switches
- Key Switches

**Digital LHDC** is a two core cable that responds to a small flame. The reactive polymer insulators melt at a specified alarm temperature, causing the two inner conductors to fuse together creating a switched circuit.

The cable is continuously monitored and provides Open Circuit (Fault) and Short Circuit (Fire) notification by inclusion of an End of Line device (EOL).

Patol's LHDC Construction comprises of a twisted pair of twin core cables. Each core comprises of tinned copper coated spring steel and is coated in a heat reactive polymer. The cable is then protected by a Black Chemical and UV resistant Nylon outer sheath.

Patol's LHDC can also be supplied with a Stainless Steel over braid connected to earth and is recommended to eliminate the risk of Electro Static discharge.



### Temperatures:

- 700-070 – **70°C Alarm Temp**, 45°C Max Ambient
- 700-090 – **90°C Alarm Temp**, 70°C Max Ambient
- 700-071\* – **70°C Alarm Temp**, 45°C Max Ambient
- 700-091\* – **90°C Alarm Temp**, 70°C Max Ambient

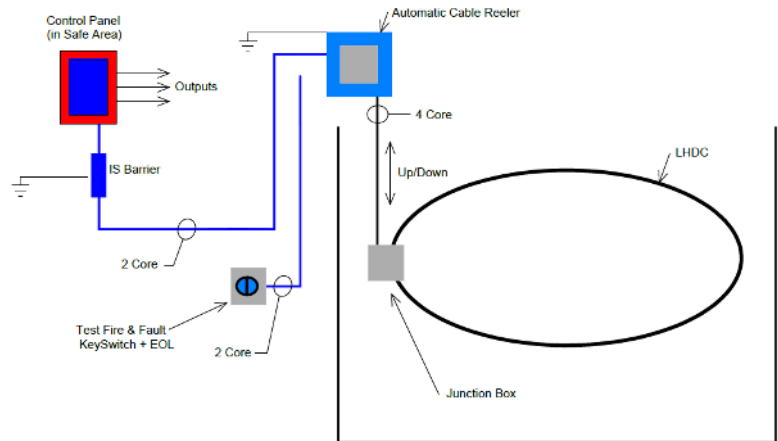
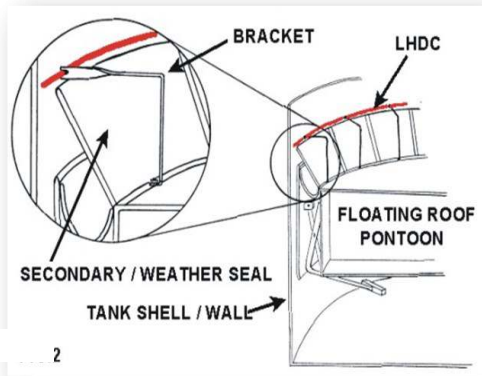
\*LHDC with Stainless Steel over braid.

### Response Time:

Less than 10 Seconds to a small flame

### UL Listed:

UL File No. S24081 UTHV Listed



### Rim Seal Protection

LHDC is mounted above the rim seal at a location where it will most readily detect any leaked vapour ignition that may occur.

Brackets are fixed to the roof pontoon and extended out to cover the secondary seals motion point with the shell wall of the tank. Brackets can also be mounted to the primary scissors or pantograph seal.

There is a considerable variety of mechanical arrangements of Rim Seals. Each must be separately examined and the most practical mounting method determined.

Patol offer a range of mounting brackets and these are used in conjunction with a protective sleeve and a stainless steel tie wrap.

### Automated Cable Reeler and Retractable cables

Electrical connection between detection cable and the control panel can be problematic due to the rise and fall of the floating roof as standard cable cannot be used.

Patol's ATEX approved Cable Reeler allows the electrical connections between the LHDC and Fire Alarm Control Panel.

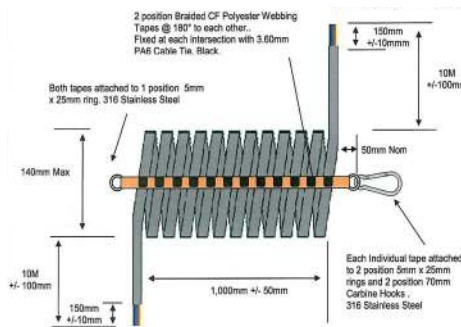


The Automatic Cable Reeler is installed on the rim at the top of the tank. This is connected to the junction box located on the roof. The Automatic Cable Reeler adjusts for the movements of the roof, uncoiling cable if the level falls and winding cable when the level rises.

The mechanism is enclosed in either a 316 grade stainless steel cabinet or a 304 grade stainless steel cabinet. The connecting cable is resistant to chemical agents and high temperatures.

The unit can be installed both in vertical or horizontal position, by means of fixing holes located on both sides. There is a rain shield (removable) to provide protection up to IP42.

Patol also supply an alternative four core coiled cable arrangement. The cable is self-supporting with additional earthed ladder strap and side hangers.



This is used with a Stainless Steel cable collector mounted on the tank floating roof.

The coiled cable is connected between two junction boxes. One is located on the tank shell rim, the other on the floating roof.



### Junction Boxes and EOL Boxes

Connection of the 4 core cables and the LHDC loop is made by using Patol's Stainless Steel Junction box.



Patol's EOL with fire and fault test switches can be mounted in a convenient location, either at the top of a tank access ladder or at ground level outside of the tank. This enables routine maintenance/testing the complete system back to the control room.

