Firesense Linear Heat Detection

Analogue and digital cables, interfaces and accessories
Firesense Linear Heat Detection (LHD) is a cable based system that provides economical temperature monitoring at the precise point of risk. The system is reliable, flexible and has the ability to detect abnormal temperature variances before they develop into a fire situation. The comprehensive Firesense portfolio comprises both Analogue and Digital systems, allowing a large range of both commercial and industrial overheat and fire risks to be protected.

Firesense cable and its associated controllers allow integration with many fire alarm and extinguishing control systems, offering a complete system solution. In addition, the use of ATEX approved junction boxes and Intrinsically Safe barriers enable Firesense systems to be used in hazardous areas.

Firesense is the answer where conventional heat detection is difficult to install and maintain.
Analogue (Resettable)
Analogue cable monitors the rise in temperature. An electronic controller continually measures the electrical resistance in the cable between the metallic core and the outer braiding. If the change is sufficient the controller triggers an alarm for the hot spot zone. Analogue linear heat detector cable will reset itself after an alarm once it has cooled.

Digital (Non-Resettable)
Digital cable monitors when a specified temperature is reached. At this point, the construction of the cable provides an electrical closed contact. This is monitored by an electronic controller which can identify the hot spot within metres. Digital cable is non-resettable.
Firesense Analogue Linear Heat Detection Cable (LHDC) is designed to provide early detection of fire and overheating in circumstances where other forms of detection would not be viable, either due to inability to sustain the environment requirements or through prohibitive costs.

Extensive single zonal lengths of the LHDC may be installed with the ability to trigger alarms for hot spots occurring on very small sections of the overall cable. LHDC analogue is a coaxial cable constructed with a copper coated steel central conductor, an inner insulation (dielectric), a tinned copper braid layer and an overall protective sheath.

The primary mechanism of heat detection is the resistance of the dielectric, monitored between the central conductor and braid layer, having a negative temperature coefficient.

Analogue cable is employed in conjunction with an end of line terminating device and a zone monitoring unit or control panel with an appropriate LHDC interface channel.

LHDC may be installed in Hazardous areas by means of Intrinsically Safe Zener Barriers. Similarly when the protected area is remote from the monitoring equipment interposing cables may be employed.
EU-R 19” Rack System
Analogue Cable Interface

The EU-R system uses Patol’s LDM-519-RMA-N and LDM-519-RCS-N cards in conjunction with our Master Motherboards allowing installation in 19” Rack mounting panels. The LDM-519-RMA-N cards are designed to monitor a zonal length of Analogue LHDC for elevated temperature states. Two adjustable levels of alarm are provided, one of which may be optionally employed as a Pre-Alarm. The LDM-519-RCS-N card is a common interface module allowing group monitoring of multiple zones.

LDM-519-LP
Analogue Cable Interface

The LDM-519-LP is designed to monitor a zonal length of analogue cable for an elevated temperature condition. It operates in conjunction with a single core coaxial cable and an end of line terminator. The module provides early warning of hot spots and fire conditions on short sections of the overall zone length, and is SIL 2 approved. Maximum zone length for analogue LHDC is 500m when connected to this module, subject to the maximum ambient temperature and the configuration of the unit. It is designed so that it can be configured to operate in two wire mode that emulates the operation of conventional fire detectors, allowing for direct interfacing with fire control panel trigger circuits. The modular form of the unit enables it to be provided in a variety of discrete housings and readily integrated into special control panels.
Firesense LHD digital cable and interfaces

A fixed temperature system with accurate heat point detection

Firesense Digital Linear Heat Detection Cable (LHDC) is designed to provide early detection of fire conditions and overheating in circumstances where other forms of detection would not be viable, either due to an inability to sustain the environment requirements or through prohibitive costs.

Extensive single zonal lengths of the Digital LHDC may be installed with the ability to trigger alarms for hot spots occurring on very small sections of the overall cable, with the ability to identify the distance to the alarm point in metres.

The LHDC may be employed in a wide variety of applications but is particularly suited where there is harsh environmental condition, a physical or hazardous maintenance access constraint to protect the area, or a requirement to cost effectively install detection in close proximity to the risk.

The primary mechanism of LHDC is that the inner cores insulating polymers are specially formulated such that the polymers will plasticises at a specific temperature, causing the inner cores to make contact and send a signal to the controller.

Firesense Digital LHDC is available with temperature ratings of:

- 70°C
- 90°C
- 105°C
- 180°C
- 240°C

in both braided and non-braided versions.
LDM-519-DIM
Digital Interface Monitor

The LDM-519-DIM module is designed to monitor a length of Digital LHDC for both a fire condition, and fault status (open circuit). The DIM module is certified to be fully compatible with SIL 2 systems. Signalling of fire and fault status is generated by means of volt free contacts.

The module has been specifically designed in a DIN rail format to allow it to be used in a variety of discrete housings or integrated multi zone control panels. Patol offer a complete range of special build panels which can incorporate this module for projects that require unique and tailored solutions.
Cable trays and racks

Generally cable trays and racks are located in restricted spaces such as service tunnels and vertical risers, making access difficult and potentially leading to undetected fire spread. Firesense LHD is ideally suited to this type of application as it can be installed very close to the point of risk giving the earliest possible detection of an overheat condition. Firesense LHDC is unaffected by the environmental conditions which may cause false alarms with other detection types such as dust and humidity.

Car parks

Combustible materials used in passenger vehicles can result in fires that burn more intensely and generate higher temperatures than ever before with significant opportunity for fire spread. Detection systems in car parks are often subject to the elements and vandalism. Firesense LHDC is ideal for this type of application where wind, dust and moisture are present which can often lead to false alarms with other systems. It is also unaffected by seasonal weather temperature variations and provides a discrete form of detection.

Conveyors

Conveyor fires are most commonly caused by friction, which if allowed to spread can cause severe damage to the belt, material being transported and the conveyor housing. Firesense LHD can be used to provide point of risk detection to give an early warning of an overheat condition. Interfacing with other control equipment can initiate conveyor shut downs and operation of suppression systems to prevent the spread of a fire. Firesense LHDC is particularly suitable as it can be installed where high levels of dirt, dust, wind and moisture exist and still be effective.

Trains and buses

Fast moving trains present a particularly difficult fire prevention situation as wind flow will quickly generate an overheat condition into a full blown fire which can spread rapidly. Buses can face similar risks, particularly with modern engines running at high temperatures. Firesense LHD is a solution aimed at combatting the risk early enough for the fire to be extinguished without damage or risk to life. Firesense LHDC’s ability to be installed in tight spaces is a major factor in its suitability for trains and buses.
**Warehouses**

Fires in densely packed racking can be detected with a localised Firesense LHD system. The cable can be installed within the racking to provide detection very close to the point of risk, providing a discrete detection system which is unaffected by the normal working environment which may comprise dust and dirt. With Firesense LHDC, the warehouse and racking can be split into zones to reduce the search area and to activate the relevant sprinkler/suppression system to restrict the spread of fire.

**Fixed and floating roof tanks**

Tank farms containing highly flammable material in close proximity to each other pose a significant fire risk. With floating roof tanks, the main risk of fire is from the ignition of vapour escaping from a damaged/worn rim seal. It is essential that fires are detected at the earliest opportunity to prevent widespread fire and activate suitable fire suppression systems. Firesense LHD can monitor vents, flanges, gauging points, manholes and general bund areas for fire. The system can be linked into a main fire system to trigger activation of deluge water spray/foam systems.

**Tunnels**

Tunnels offer limited access/egress points, making it crucial that fires are detected at the earliest opportunity to enable evacuation and fire extinguishing. Vehicle or fuel fires can be detected with Firesense LHDC installed directly over roadways and around sumps and drains designed to contain fuel or oil spills. Firesense detection zones are calculated according to the length of tunnel, and can be linked to water, gas or foam suppression systems for localised fire fighting or activation of extraction systems.

**Power generation**

Power generation plants of all technologies employ large equipment including turbines, motors and actuators which can often be difficult to monitor for potential fire risk due to restricted access. Firesense LHD answers these problems with a cable-based system that can be fitted in restricted spaces and additionally is immune to the vagaries of dirt, dust and moisture which can upset other detection technologies. Cable runs split into zones provide swift alarm response for evacuation procedures and fire suppression systems to be activated.
Fixings

Genuine accessories can provide a greater guarantee to the overall performance of Firesense Linear Heat Detection systems. This is particularly so in harsh and hazardous environments where Firesense stainless steel clips can be employed. Firesense clips have been specifically developed to comply with the latest industry requirements and are available in either mild steel or stainless steel versions. The mild steel clips are suitable for general indoor and outdoor use whereas the stainless steel clips are suitable in environments where the clip may be exposed to harsh environments and chemicals.

Floating Roof Tank Automatic Cable Reeler

Firesense LHD cable can be installed at the edge of the rim seal of a floating roof tank using an automatic cable reeler to accommodate the rise and fall while providing the electrical connection between cable and control panel. The mechanism is enclosed within a stainless steel cabinet and the connecting cable is resistant to chemicals and high temperatures.
Ancillaries

The Patol End Of Line (EOL) junction boxes are designed to terminate either analogue or digital LHDC. The EOL unit provides fault monitoring on the cable. Analogue EOL units can monitor for both open and closed circuit faults. Digital EOLs monitor for open circuit faults.

Patol’s range of accessories has been designed so that Firesense LHD systems can be configured to perform flawlessly in many different situations.

A variety of clips, coatings, cable ties, EOLs and junction boxes ensure Firesense systems best meet end user specifications with a complete end-to-end LHD solution. All Firesense systems and accessories are accompanied by detailed installation guides and technical documentation to ease installation and maintenance.