Installing Linear heat detection cable (LHD)

Applications

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1. TEMPERATURE RANGES

- Linear heat Detection Cable (LHD) is approved as a heat actuated device for use on a supervised fire alarm control/releasing panel. LHD Cable is available in multiple temperatures, and ratings are the same as those for heat detectors and sprinklers. Refer to our temperature rating chart (Figure 1) for assistance in choosing the best wire for your environment. LHD Cable can be installed for both area protection and local applications (close to the hazard or potential heat source) for a faster response.

- LHD Cable use is intended to be in conjunction with an approved fire alarm control/releasing panel and installed in continuous runs without T-Taps or branch lines.

LHD Cable should always be enclosed in conduit for the following; when installed 1.83 meters or less from the floor, all runs through the floor, or entry into a manual pull station.

Maximum Ambient Install Temperature	Alarm Temperature
Up to 40°C	68°C
Up to 50°C	78°C
Up to 70°C	88°C
Up to70°C	105°C

Fig. 1

2. INSTALLING LDH CABLE

During installation, it is important to handle LHD Cable with a degree of care. The polymer outer covering is very durable, but the inner core wires and thermal reactive sheathing can be damaged if not handled properly. The following are some installation guidelines and hints to assist you in avoiding damage to the LHD Cable, and to help ensure a successful and trouble free installation.

- ALWAYS test wire before installation with a multimeter to be sure there are no shorts in the wire. LHD Cable integrity is also tested prior to shipping for quality assurance.

- ALWAYS allow the proper amount of sag when installing the detection wire. Please refer to the sag chart below (Figure 2) for detailed information.

Sag Chart

Temperature	Sag	Wire Mount Spacing
-7°	1.9cm	1.5m
-17°	2.22cm	1.5m
-29°	2.54cm	1.5m
-40°	2.85cm	1.5m

Fig 2

- ALWAYS be sure to install LHD Cable to meet local and national codes, and installation guidelines.

- NEVER tighten mounting clips to the point where the detection wire is pinched, stretched, or to the point where it cannot move freely within the mounting device.

- NEVER bend the detection wire to a 90° angle. All bends or turns should be rounded with a minimum 7.6 cm radius as shown below in figure 3.

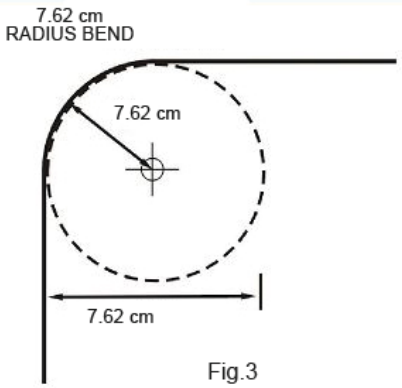

Fig.3

- NEVER paint the detection wire, per UL and FM requirements.

- NEVER use wire nuts or similar devices as all connections should be made with approved splicing techniques using terminals blocks.

- NEVER stretch the detection wire, always allow some slack in the runs especially in refrigerated storage applications.

- NEVER place the detection wire where it can be damaged by foot, equipment, or truck traffic.

- NEVER store detection wire in areas where the ambient temperature is near, or exceeds the activation temperature of the wire.

- NEVER install LHD Cable using non-approved fasteners, this may damage the wire, cause false alarms, and void the warranty.

2.1 Splicing

When splicing LHD Cable, be sure to securely fasten the detection wires in the Splicing Block to prevent accidental dislodging of the wires. Thoroughly wrap the splice by overlapping the layers approximately half the width of the splicing tape. This will prevent humidity or dust to enter the splicing connection. If splicing in low temperatures (below 0°C, be sure to use Low Temperature Splicing Tape. If connections need to be weatherproof, Sealant Tape should be used.

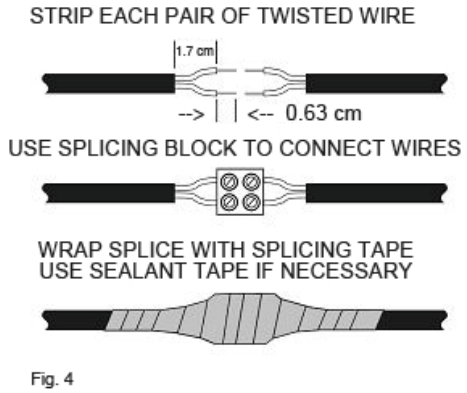

Fig. 4

2.2 Splicing Connectors

When splicing LHD Cable, it is necessary to use a splicing block to ensure a durable and proper connection. Splicing tape is also used to wrap the point of the splice to prevent moisture and contamination build up.

3. AUTOMOBILE TUNNEL DETECTION

When creating a LHD Cable design for tunnels, keep in mind that a single zone of LHD Cable can extend up to 3.000 meters. As seen in the diagram below, in most cases, the detection wire is installed on the ceilings over the traffic areas. A complete design would include coverage of not just the traffic areas but also equipment and mechanical rooms, tray runs and tunnel ventilating systems.

Figure 5 illustrates a simple tunnel application. With a maximum of 3.000 meters

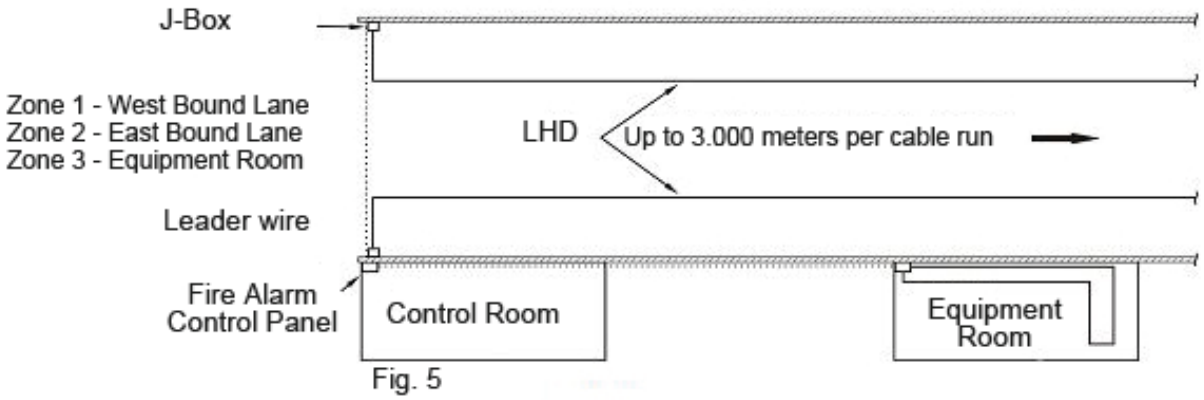

Fig. 5

4. REFRIGERATED AND COLD STORAGE DETECTION

4.1 Refrigerated Storage Areas

When using LHD Cable as an initiating device for pre-action sprinkler systems in refrigerated storage areas, attention should be paid to the guidelines provided by local regulations. Generally, local regulations require linear heat detection wire be installed at spacing not greater than that allowed for a ceiling sprinkler system. For this reason, when ceiling detection is required in a refrigerated storage application, the ceiling detection wire may be fastened to the sprinkler piping.

When installing LHD Cable in conjunction with a sprinkler system in a rack system, local regulations must be followed along with manufacturer's recommendations. In the case of signal or double row racks, one line of LHD Cable is needed for each sprinkler level. The detection wire should be attached to the load beam at the sprinkler level and run in the transverse or longitudinal flue space. For multiple row racks, each sprinkler line would require a corresponding run of detection wire.

The following sections detail using LHD Cable in a variety of rack storage systems including open rack with and without sprinkler protection and refrigerated storage. When installing LHD Cable in a rack system with or without a sprinkler system, local regulations must be followed along with the manufactures recommendations.

4.2 Open Rack Storage without Sprinklers

When installing the LHD Cable in open rack system without a sprinkler system, the number of detection wire runs is based on the height of the rack. As a general rule, there should be one detection wire run for every 3 meters of rack height. The detection wire should be attached to the load beam and run in the transverse flue space.

- **For example, an 5.5 meter rack should be given two wire runs while a 12 meter system should have four wire runs.**

- **For example, an 5.5 meter rack should be given two wire runs while a 12 meter system should have four wire runs.**

4.3 Open Rack Storage With Sprinkler protection

In the case of signal or double row racks, one line of LHD Cable is needed for each sprinkler level as shown in figure 7. The detection wire should be attached to the load beam at the sprinkler level and run in the transverse flue space. For multiple row racks, each sprinkler line would require a corresponding run of detection wire.

Installation**: The leader wire is run from the fire alarm control/releasing panel to a J-Box mounted to the rack for a particular zone. The LHD Cable is then run from the J-Box through the racks as indicated in Figures 6 and 7, which may then cross the isle to a second rack system. When mounting the detection wire on the horizontal load beam, utilize the angle iron or open channels of the rack structure to help protect the detection wire from accidental breakage from forklifts and product. The wire may be fastened to these structures by using cable clips made from nylon 6.6 to withstand the continuous cold or subzero temperatures. When crossing aisles, be sure to elevate the LHD Cable enough to stay clear of any possible damage that may be caused by forklifts, cranes or product. Detection wire may be run one section above the sprinkler level to prevent damage to both the sprinkler pipe and detection cable simultaneously which may alarm and begin to flow water.**

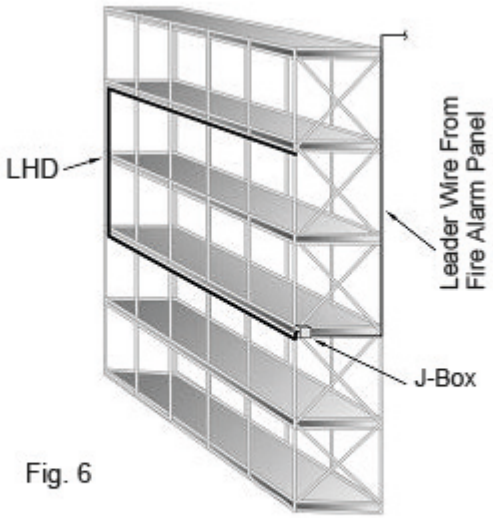

Fig. 6

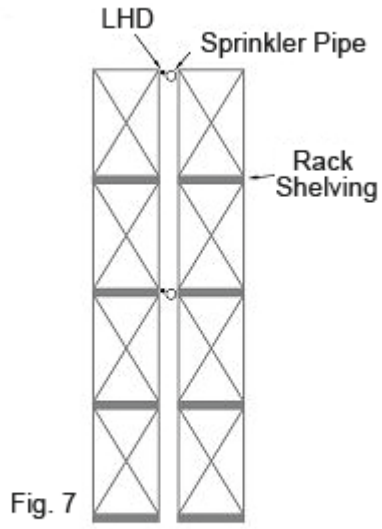

Fig. 7

A refrigerated storage warehouse may require a Class A detection circuit rather than Class B. For this type of installation, a copper wire is run from a J-Box at the end of the detection wire zone back to the panel to complete the circuit.

LHD Cable will contract as temperature drops when a refrigerated storage warehouse is brought down to operating temperature. Installations in refrigerated storage areas, prior to cool down, require a certain amount of sag to be maintained during installation to accommodate for contraction. Figure 8 is a chart to assist in determining the amount of sag, which should be maintained between mounting fasteners.

Sag Chart

Temperature	Sag	Wire Mount Spacing
-7°	1.9cm	1.5m
-17°	2.22cm	1.5m
-29°	2.54cm	1.5m
-40°	2.85cm	1.5m

Fig. 8

4.4 Pre-Action and Deluge Sprinkler Systems

When using LHD Cable as an initiating device for pre-action sprinkler systems, attention should be paid to the spacing and location guidelines provided when applicable by local regulations.

4.5 Zone Definitions

It is important to note that a detection zone allocation for LHD Cable should not be confused with a zone allocation for a sprinkler system. If a sprinkler zone extends beyond the capabilities of a signal detection zone then an additional detection zone must be added. In this case, either detection zone will operate the same solenoid valve for the sprinkler zone. Detection zone coverage should not extend beyond the coverage of the sprinkler zone.

5. BAGHOUSE AND DUST COLLECTOR DETECTION

The shape and design of baghouses and dust collectors vary. The outer perimeter of the unit must be protected as illustrated in Figure 9. Depending on the design of the unit, LHD Cable may be run on an inner perimeter as well as seen in Figure 10. If required, detection cable may also be run in conduit to a higher level inside the unit.

Either guide wire or L-Brackets may be used to secure the detection wire approximately 10,9 meters above the base of the unit. When using L-Brackets, be sure to support the detection cable a maximum of every 1.5 meters.

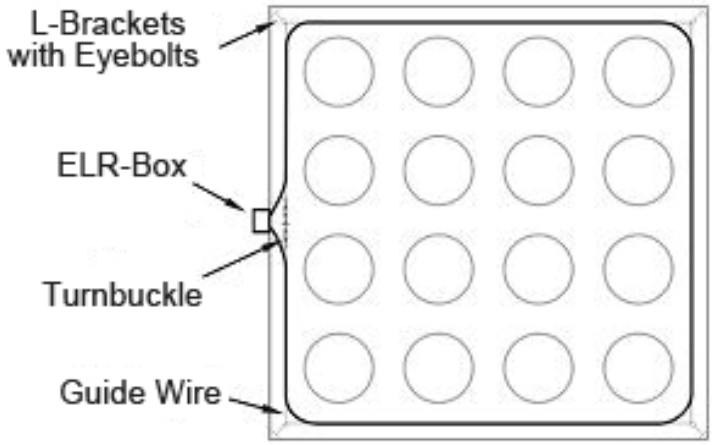

Fig 9

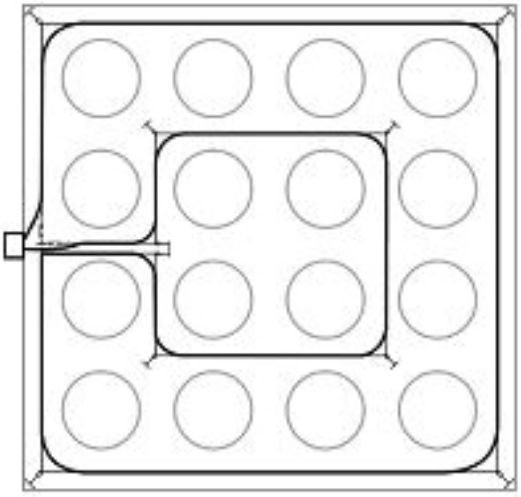

Fig. 10

6. PROXIMITY DETECTION

6.1 Proximity Detection

For proximity or special application protection, LHD cable should be installed on or immediately above the hazard in a way that allows for it to be exposed to a rise in temperature caused by a fire condition.

6.2 Motors, Generators, Pumps, Valves

LHD cable can be mounted directly on the surface of virtually any type of mechanical and electrical equipment. This type of installation allows for quick response to overheating equipment, which can provide warning earlier than using area detection alone. Typically, the LHD cable used to protect equipment directly is of a higher activation temperature. The higher temperature detection wire can be spliced into the same detection wire used for the area detection and both be considered part of the same zone. The distance locating option may be used to identify the higher temperature wire on the zone, which can isolate the equipment in question.

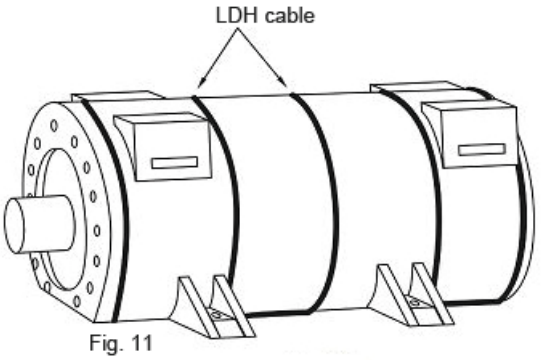

Fig. 11

6.3 In Cabinet Detection

LHD cable can be weaved through electrical panels, switchgear and other electrical cabinets in a manner to bring it near electrical components in the cabinet. Detection cable should be fastened with non-conductive nylon cable clips. In this type of application, special care needs to be given to ensure that the proper temperature of LHD cable is selected based on the ambient temperature of the protected area and surface where the detection wire is mounted.

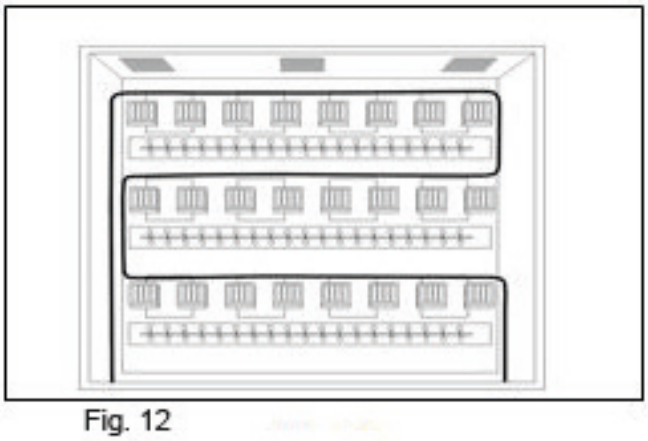
Fig. 12

7. CABLE TRAY DETECTION

7.1 Cable Trays

A sine wave pattern, as shown below in figures 13 and 14, should be used when installing LHD cable in a cable tray application. The maximum distance between each peak, or valley, should not exceed 1.8 meters. The detection wire is secured in place at the sides of the cable tray using the most appropriate mounting clip based on the tray construction.

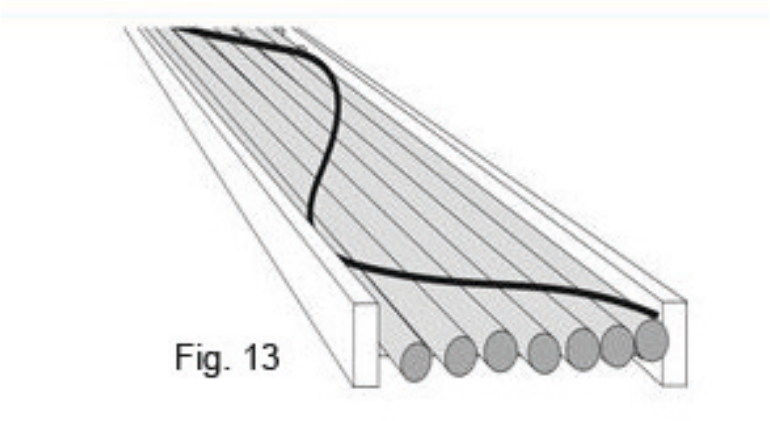

Fig. 13

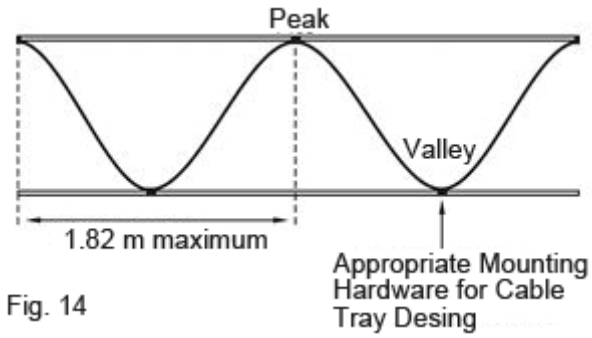

Fig. 14

NOTE: It is important that the detection wire be placed on top of all cables in the tray, and that any additional cables runs must be threaded below the detection wire run to provide proper protection.

7.2 Estimating LHD cable Length for Cable Trays

Since the recommended installation requires that the detection cable be run in a sine wave pattern, it may be difficult to estimate the total length of LHD cable needed for a particular run. The following calculation will help determine the approximate amount of LHD cable needed for a cable tray installation (Figure 15).

To determine the number of mounting points along the cable tray, divide the length of the cable tray by 3 and add 1.

Cable Tray Length divided by Width Coefficient = Total Length of LHD

Cable tray Width	Width Coefficient
46 cm	.87
61 cm	.78
91.4 cm	.65
122 cm	.57

Fig. 15

8. RACK STORAGE DETECTION

8.1 Rack Storage

The following sections detail using LHD cable in a variety of rack storage systems including open rack with and without sprinkler protection. When installing LHD cable in a rack system with or without a sprinkler system, Local Regulation guidelines must be followed along with the manufacturers recommendations.

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- **For example, an 5,5 m rack should be given two wire runs while a 12 m rack system should have four wire runs.**

8.3 Open Rack Storage with Sprinkler Protection

In the case of signal or double row racks, one line of LHD cable is needed for each sprinkler level. The detection wire should be attached to the load beam at the sprinkler level and run in the transverse flue space. For multiple row racks, each sprinkler line would require a corresponding run of detection wire.

Fig. 16

8.4 Pre-Action and Deluge Sprinkler Systems

When using LHD cable as an initiating device for pre-action sprinkler systems, attention should be paid to the spacing and location guidelines provided by Local Regulations.

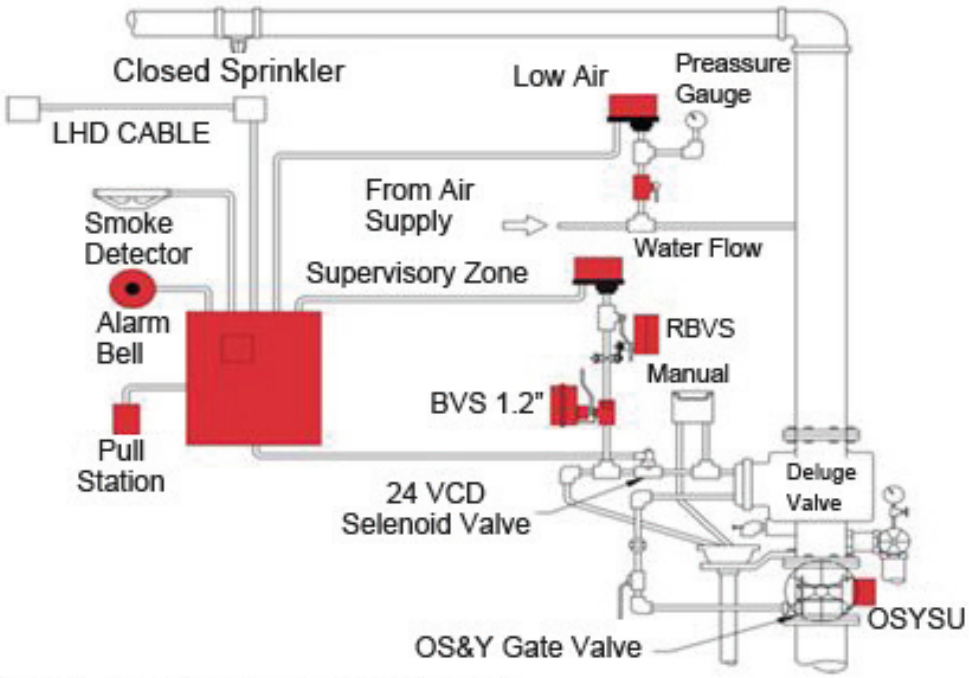

Fig. 17 - Pre-Action/Deluge Valve System

9. CONVEYOR DETECTION

There are several common areas to protect on conveyor systems. Rollers that freeze and stop rotation can create friction on the belt heating it to the point of ignition, material on the conveyor may ignite from friction or sparks, and over heating drive motors. These are all common areas to protect on a conveyor system.

Details for conveyor applications are illustrated in figures 18 and 19. At times it may be necessary to support LHD cable by using a guide wire. For these installations, the wire must be supported a maximum of every 6.1 meters. This will help prevent wire sag, which may interfere with the operation of the conveyor or be damaged by the material being transported by the conveyor. Be sure to check with plant operators to determine the height of the material transported and how it is loaded on the conveyor. For example, if a conveyor is loaded from the right side, the height of material will most likely be greater on the left side of the conveyor. Therefore, greater care must be taken when determining where the detection cable is to be located. Keeping this in mind will prevent unnecessary damage to the detection cable.

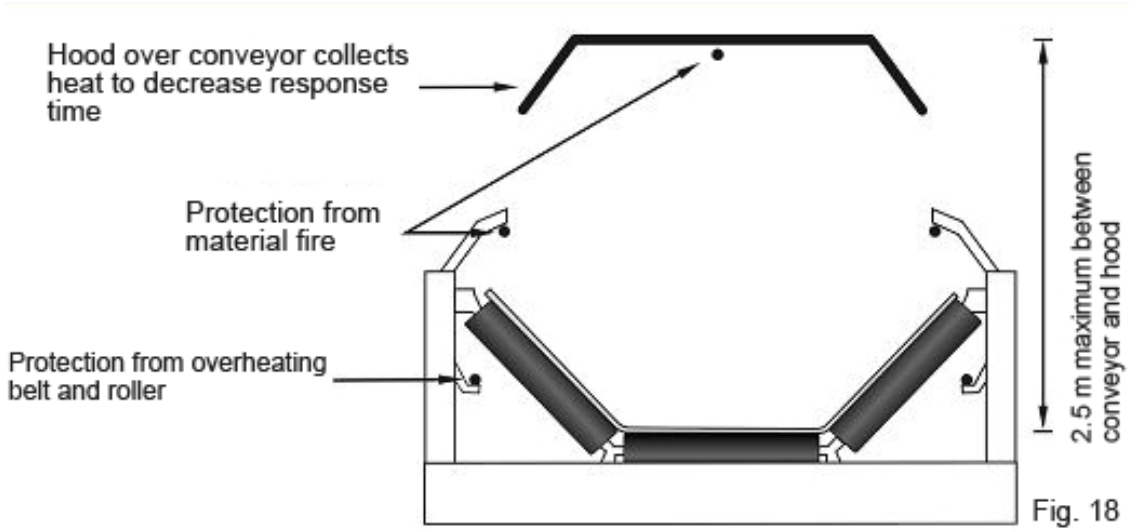

Fig. 18

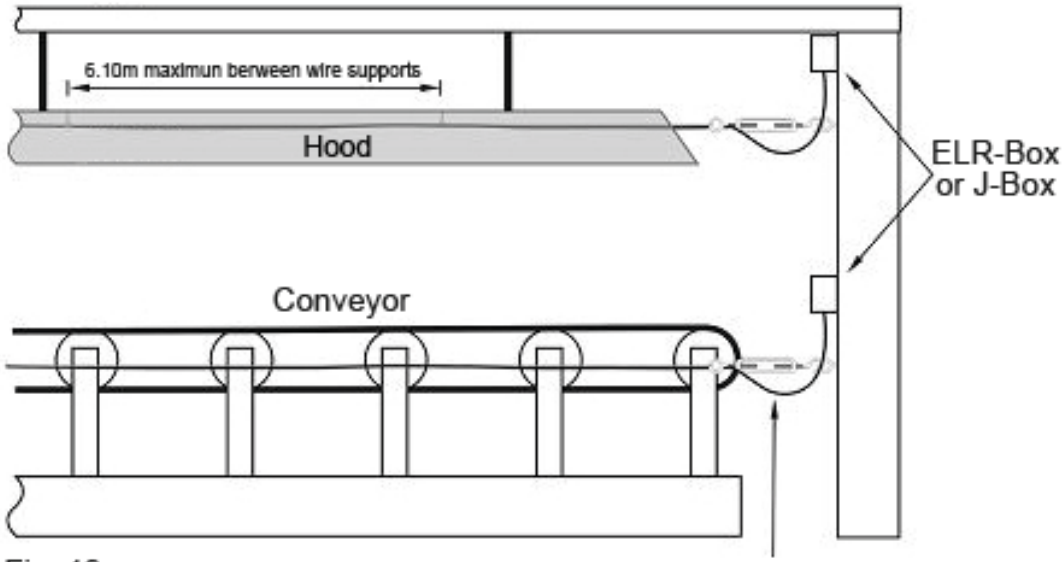

Fig. 19

These notes are to be used as general guidelines for installing linear heat detection (LHD) wire. Please be sure to check all local and national codes prior to designing and installing a system.

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