

Linear Heat Detector Cables HDC68 and HDC105

Instruction Sheet
R10169GB3



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1 Linear Heat Detector Cable HDC68 and HDC105

HDC Linear Heat Detector Cable HDC68 and HDC105 are used to monitor abnormal heat increase to prevent a full fire event. Sensors located along the cable continuously detect heat changes unlike standard point detectors. The alarm signal is generated when thermosensitive polymer insulation melts around the cable. The alarm levels are **68°C (HDC68) and 105°C (HDC105)**. The cable is covered in two copper steel wires, which are individually insulated with polymer.

Cable Lengths:

Linear Heat Detection Cable HDC68 100M (FFS06435138)

Linear Heat Detection Cable HDC68 200M (FFS06435133)

Linear Heat Detection Cable HDC105 100M (FFS06435139)

Linear Heat Detection Cable HDC105 200M (FFS06435135)

1.1 Applications

- Pipelines
- Storage Tanks
- Cable Trays
- Aircraft Hangars
- Control Rooms
- Warehouses
- Bridges and Tunnels
- Mines
- Cooling Towers
- Escalators
- Power distribution apparatus: Transformers, Switch Gears

1.2 Features and Benefits

- Ease of installation and maintenance
- Fast substitution of the shorted circuit cable sector
- Suitable to any dangerous or difficult access areas
- Short response times
- Minimum false alarms
- Simple integration with fire extinguishing systems

1.3 Constructive Characteristics

Conductors	copper-plated steel wire, diameter 0.95 mm
Insulation	special thermosensitive polymer
Insulation Colors	red – black
Cabling	two insulated conductors are cabled together
Wrapping	Polyester tape (Only for HDC-68 e 88)
Sheath	extruded PVC

P/N	HDC type	Nom. Outer Diameter $\pm 10\%$ [mm]	Approx. Net Weight [kg/km]
63607	HDC-68	4.3	25
44756	HDC-105	4.5	25

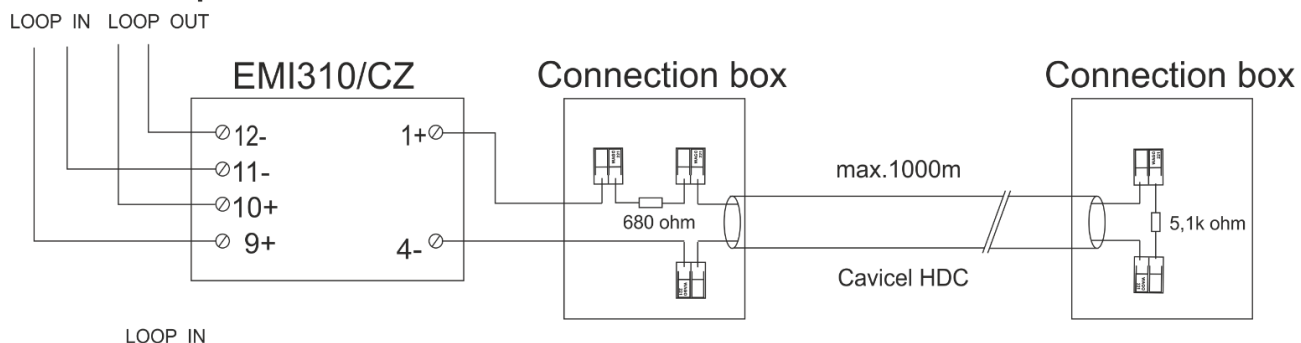
1.4 Performance Characteristics

Alarm Temperature - HDC-68 - HDC-105	68 $\pm$ 3°C 105 $\pm$ 5°C
Storage and Working Temperature - HDC-68 - HDC-105	-20/+40°C -20/+60°C
Minimum Installation Temperature	-10°C
Conductors Resistance	≤ 300 ohm/km (@ 20°C)
Dielectric Test	500 Vdc for 1'
Voltage Rating	100 V r.m.s.
Nominal Capacitance	60 pF/m
Nominal Inductance	7 mH/km
Min. Bending Radius	15 x D

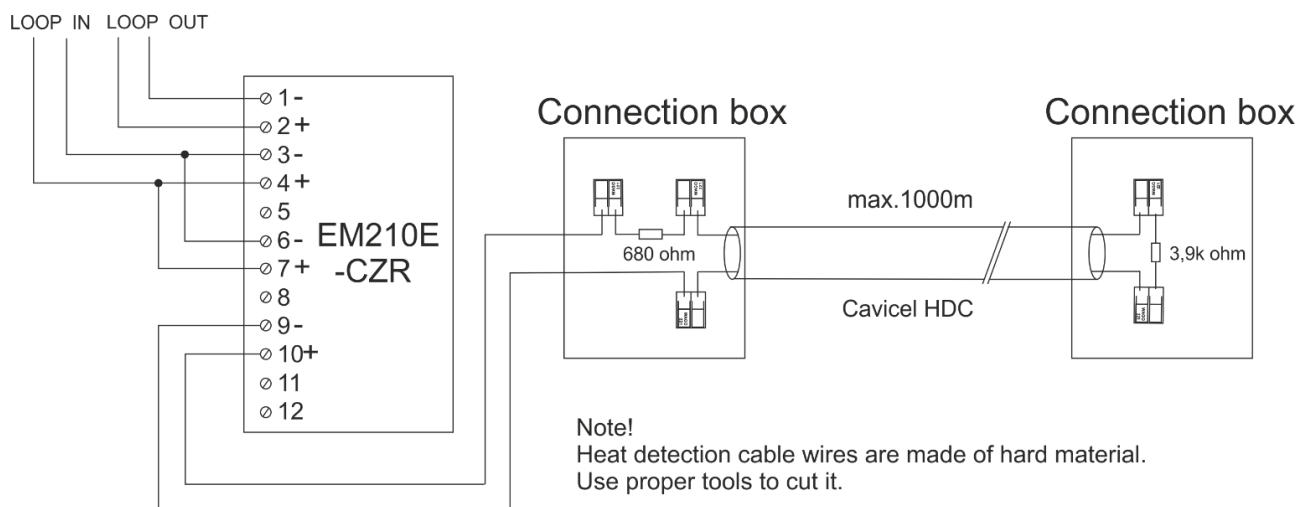
2 Cable Connection

Linear heat detection cable connection principles

ALC- loop

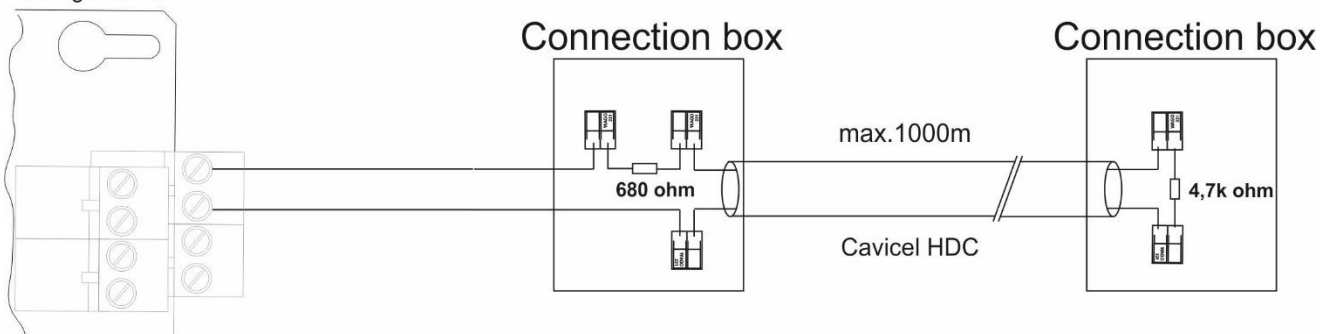


SLC- loop



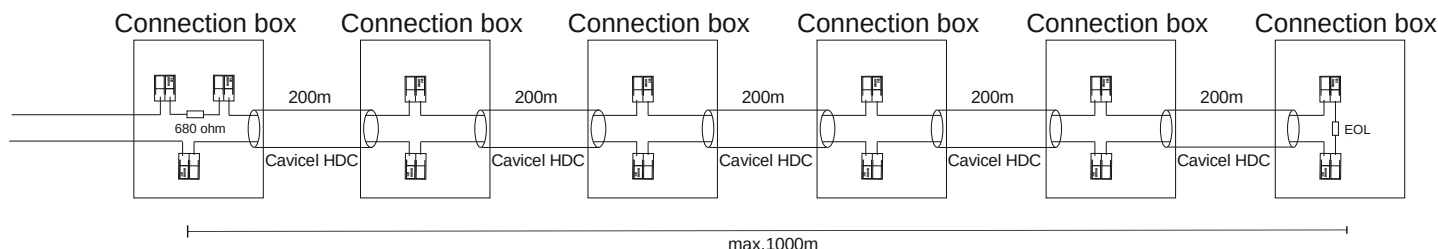
CLC

Configured as detection line



HDC is delivered in max. 200m reels.

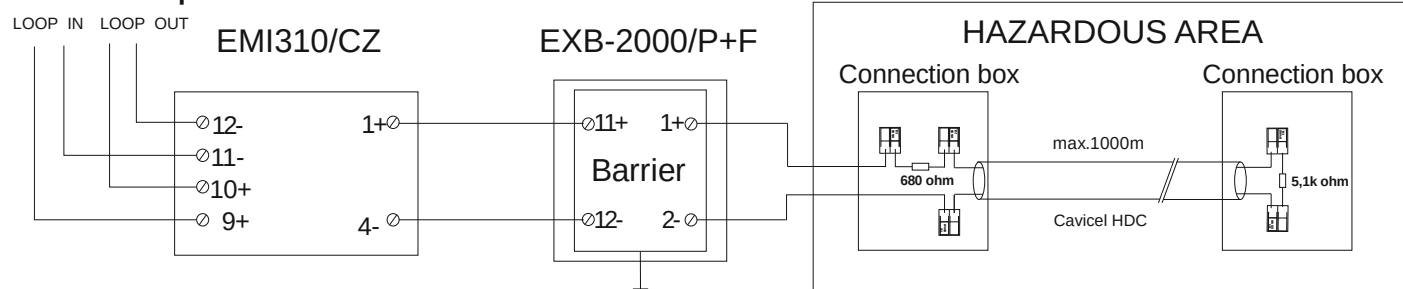
In case longer cable is needed the connections must be done on a connection box



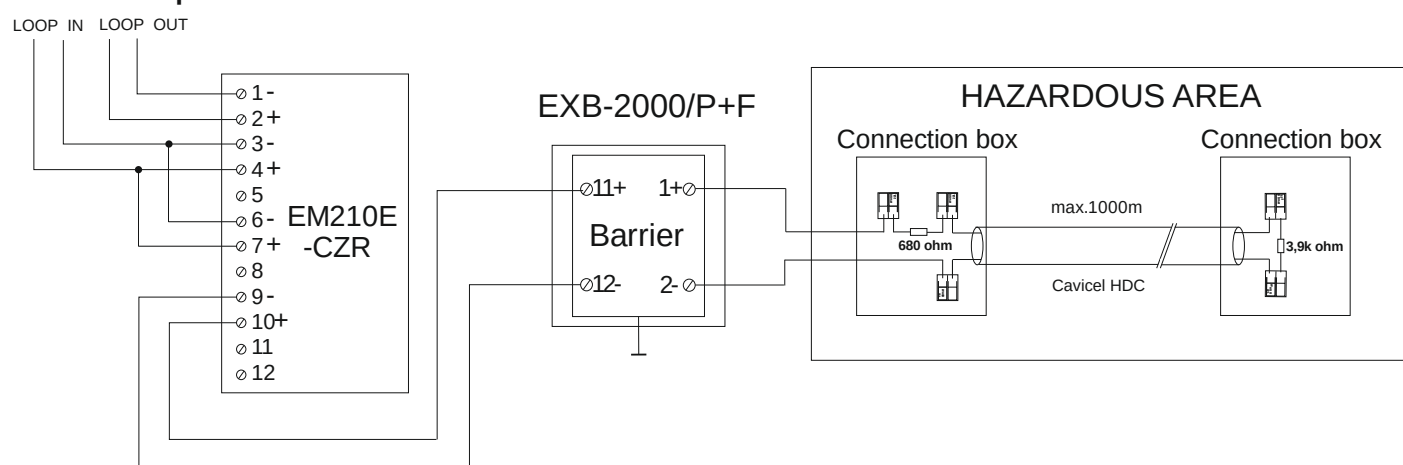
2.1 Hazardous Area Cable Connection

Linear heat detection cable IS-area connection principles

ALC- loop

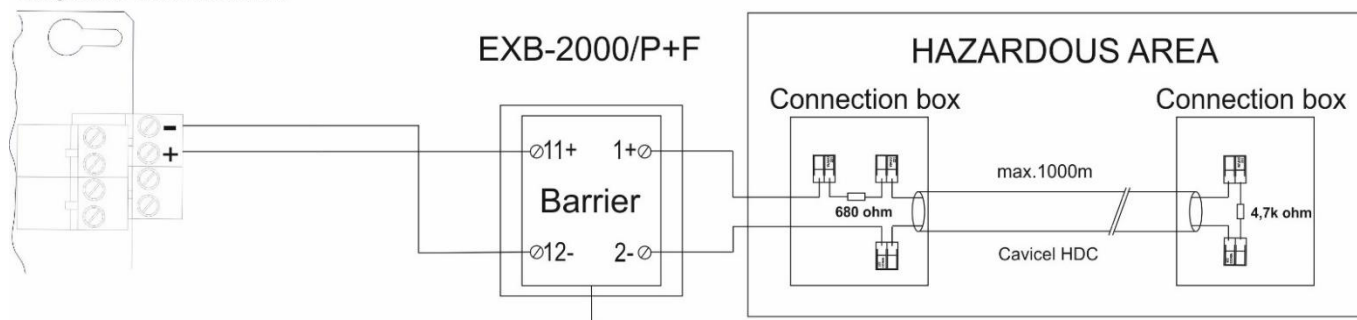


SLC- loop



CLC

Configured as Exi area detection line



3 Additional Components



Linear Heat Detection Junction Box	
Product number	FFS00703903



Linear Heat Detection Cable T-Clips	
Product number	FFS06435137

4 HDC Cable Installation

Linear Heat Detector Cables HDC68 and HDC105 are sensitive to heat and mechanical stress, which makes it important to pay attention to transportation, working environment temperature and maximum storage.

Working environment temperature shall not exceed **40°C (HDC68) or 50°C (HDC105)**.

It must be avoided to be close to heat sources, such as electric lamps, steam pipes, heaters or any heat producing. Crushing or pinching will injure cable.

4.1 Installation Warnings

Linear Heat Detector cables HDC68 and HDC105 are individually tested prior to shipment to our factory.

Opening the coil pay attention to the spring effect caused by steel conductors.

- Do not bend the cable at 90-degree, minimum bending radius is 65 mm
- Do not use pliers or other hard tools to bend the cable
- Do not use nail type clips and do not give to the cable any mechanical impact
- Do not overtighten the fastener, it must allow the wire to expand at the temperature
- Do not paint the cable
- Do not directly connect the cable to main electrical supplies
- The cable should not be installed in temperatures below -10°C
- There should be no obstructions, which would prevent heat to reach cable
- Do not use staples installed with staple guns or drivers for fastening HDC. Most commercially available staple guns which use flat staples will crush or pinch the HDC causing shorts and unwanted alarms. (Experience has also shown that even in the most skillful hands, some quantity of staples will be improperly placed during installation thereby penetrating the outer jacket and injuring the HDC internally).
- Do not expose the cable to direct sunlight, because it can cause an increase of temperature to the cable surface over the max working rating temperature admitted; for this reason take the correct precautions in order to keep the cable within the max. working temperature.

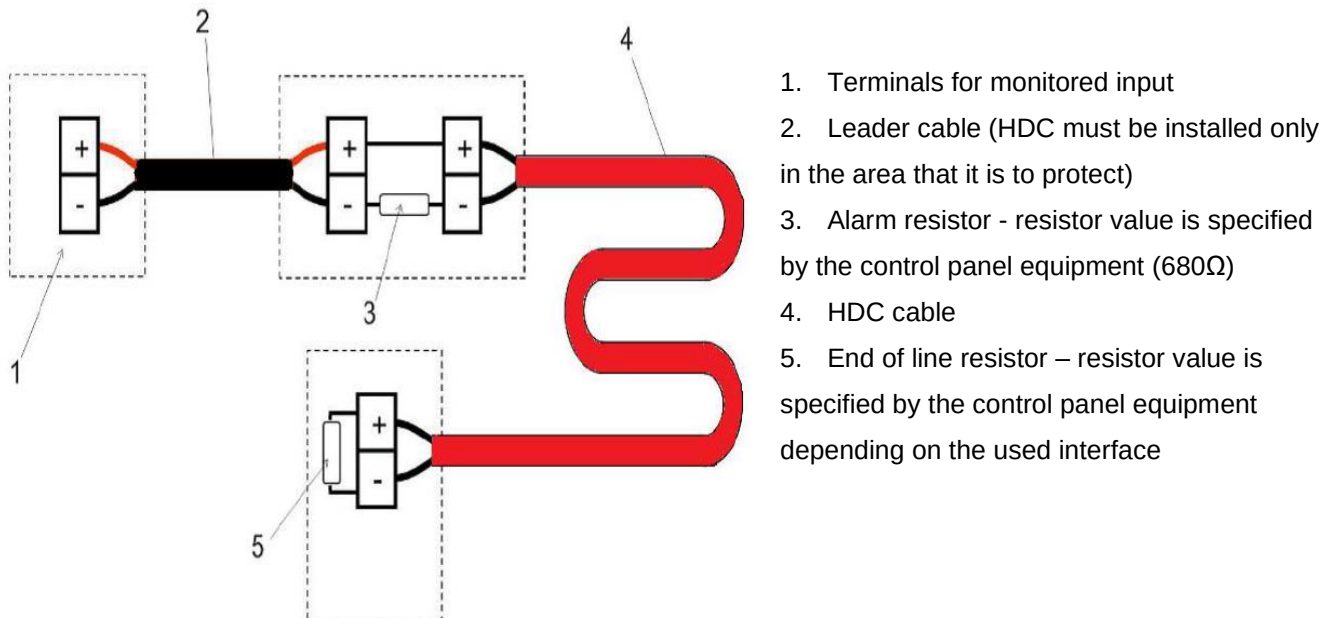
5 Location

The following information is intended to provide general principles only, therefore, the layout illustrations are “typical” in nature, and may require modification or adjustment based upon an actual engineering evaluation of the specific hazard and its relevant factors.

In general, the Linear Heat Detector should be located on the ceiling or on the sidewalls within 500 mm of the ceiling. Take into consideration that the minimum length of the Heat Detector Cable should be at least 3m to ensure the cable spring effect would work properly.

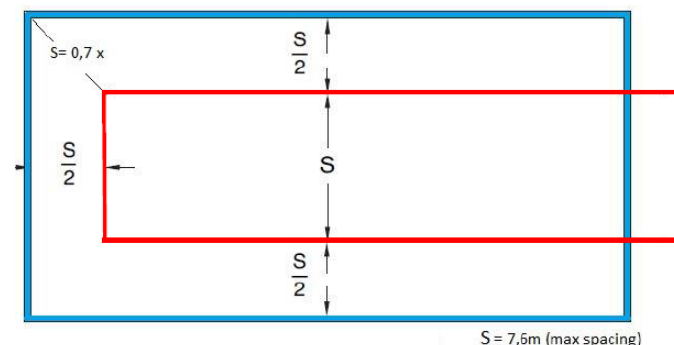
For special application protection, the HDC should be installed immediately above the hazard zone that will cause the same radial spread of heat as the ceiling of a room does in area protection applications.

It is mandatory that engineering judgment should be applied in determining final HDC cable location and spacing.



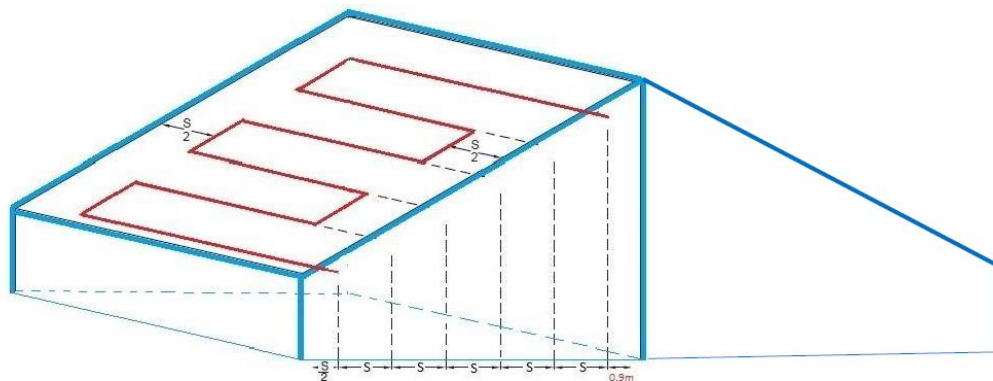
5.1 Ceiling

The maximum spacing “S” for smooth ceiling installations shall not be greater than 7.6m between parallel detection wire runs and within half the listed spacing of any walls.

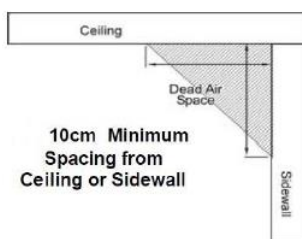


In the case of installation of HDC on a sloped ceiling there must be at least one run within 0.9m, measured horizontal from the ceiling peak. Any additional wire runs required, should be designed based on the horizontal distance projected down from the ceiling and based upon the type of construction used in the ceiling.

For ceiling heights up to 9.1m, HDC max spaced $S = 7,6\text{m}$, for installations higher than 9.1m, the spacing is reduced to half the listed spacing ($S = 3,8\text{m}$ or less).



HDC should not be installed in a corner within 10cm of a sidewall or the ceiling. As below illustrates, a dead air space is created where the ceiling and sidewall are joined. This space can affect the ability of the detection wire to function properly.



5.2 Beam Construction

Spacing design for beam construction is based on project of depth beam. When depth of beam below the ceiling is:

10cm or less

- Layout same as smooth ceiling
- Maximum parallel run spacing is 7,6m between detection wire runs

Greater than 10cm

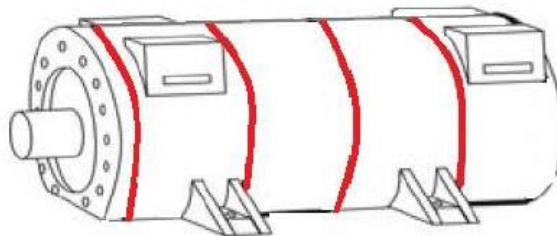
- HDC runs perpendicular to the beams
- Reduce the spacing at 2/3 of the smooth ceiling

Where the beams project more than 46 cm below the ceiling and spaced more than 2.4 m on center, each bay formed by the beams shall be treated as a separate area requiring detector coverage.

5.3 Motors, Generators, Pumps, Valves

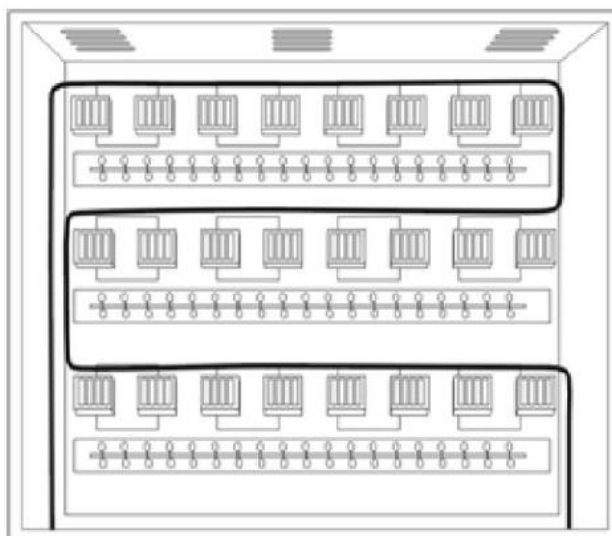
HDC can be mounted directly on the surface of virtually any type of mechanical and electrical equipment. This type of installation allows for quick response to overheating equipment, which can provide warning earlier than using area detection alone. Typically, the HDC used to protect equipment directly is of a higher activation temperature. The higher temperature detection wire can be spliced into the same detection wire used for the area detection where both are considered part of the same zone. When mounting directly to motor housings, generators, etc., the HDC selection should be governed by the ambient operating temperature of the surface it is mounted.

Other equipment that may be protected in the same manner includes transformers, switchgear, substations, resistor banks, etc. where ambient temperatures do not exceed the HDC rating.



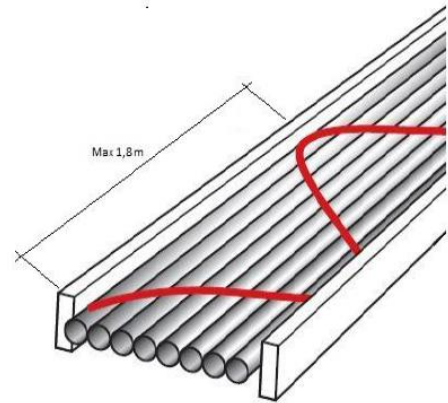
5.4 In-Cabinet Detection

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



5.5 Cable Trays

The Detector is run on top of all power and control cables in a tray and maximum distance between each peak should not exceed 1.8m. 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. This mounting hardware will ensure proper installation and contact with the cables in the cable tray. It is important that any additional cables' runs must be threaded below the HDC to provide proper cable tray protection.



The following calculation will help determine the approximate amount of HDC needed for a cable tray installation:

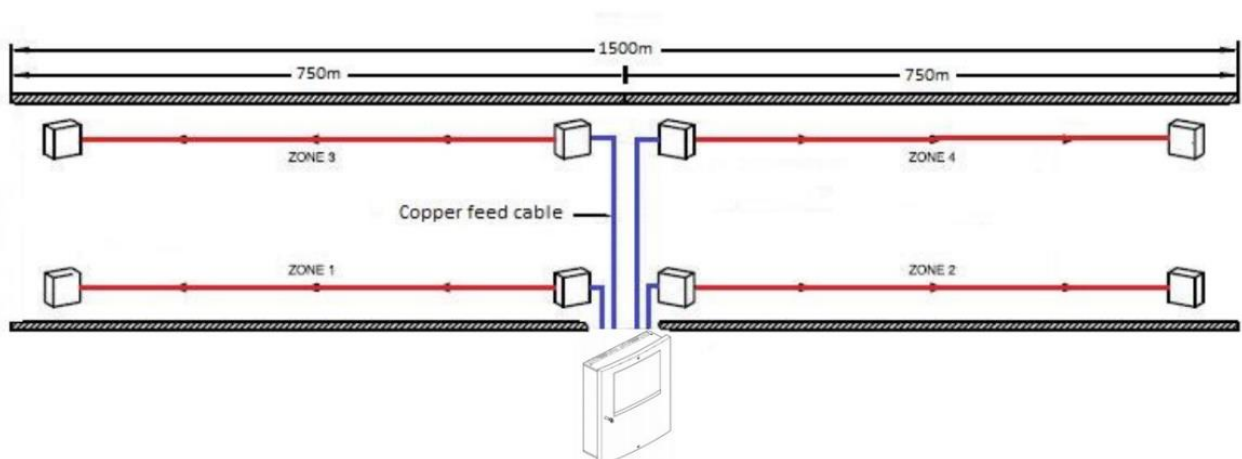
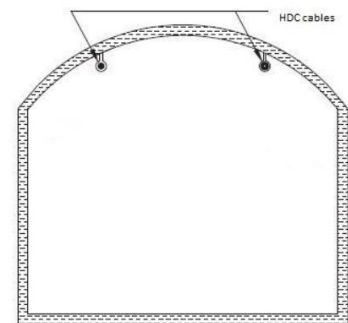
Cable Tray Width	Length of HDC = Length of Tray by
50cm	1,13
60cm	1,22
90cm	1,35
120cm	1,45

5.6 Tunnel

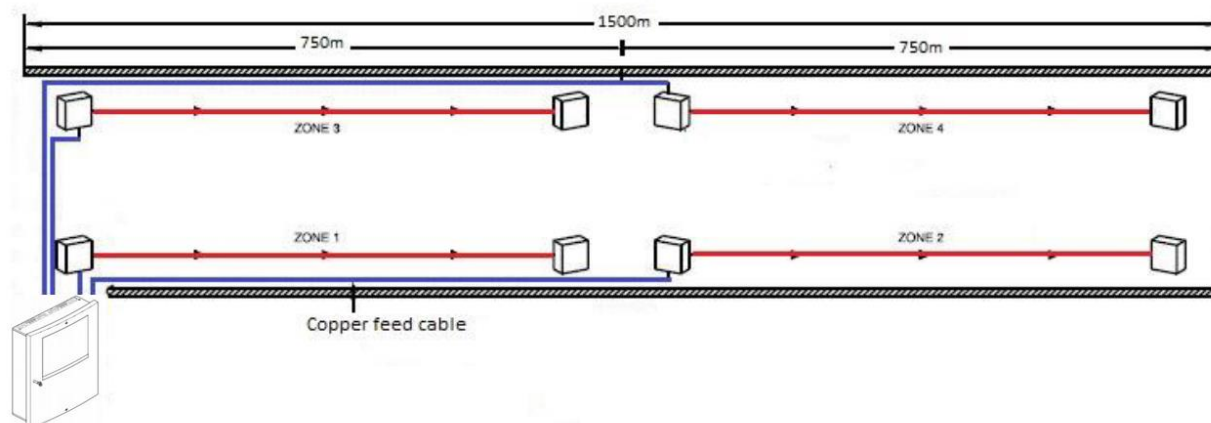
Standard spacing discussed in previous sections may be used for tunnel applications. In most cases, HDC is installed on the ceilings over the traffic areas.

With a maximum length of 3 km for each zone, HDC can offer a wide number of variations are possible for different installation configurations.

A complete design would include coverage of not just the traffic areas but also equipment and mechanical rooms, tray runs and tunnel ventilating systems.

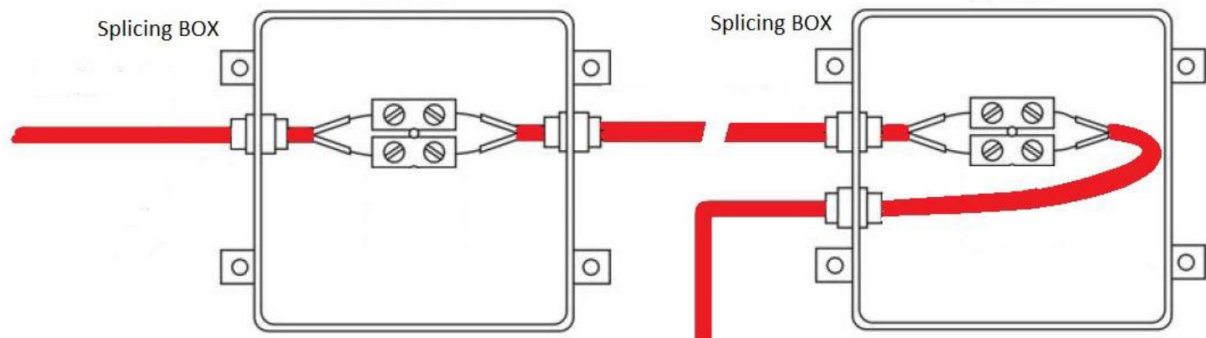


5 Location



6 Splicing

For durable splicing and for outdoor applications, in order to offer the HDC the greatest protection from humidity, dirt, and accidental dislodging, a Box splice shall be used.



7 Fasteners

The fastener is a clip which wraps around the HDC cable, usually in nylon or polypropylene material. As general rule, the nylon fasteners are preferred for applications where the ambient temperatures are expected to be low such as in freezer warehouses, and the polypropylene is for use in higher temperature installations.

Cable fixings must not damage cable insulations and must support cable at 1m intervals (min). When installed at the corners of ceiling, the fasteners should be set at 1,5-2 cm from the intersection of the lines to provide a free bend in the HDC. In some installations that require drilling into the mounting surface is prohibited, or simply not possible. For many of these situations, the solution is to utilize an adhesive system consisting of cable ties and an approved industrial adhesive. As a cautionary note, the use of adhesive mounting should be limited to applications where the continuous operating temperature will be less than -18°C or exceed +80°C and which will not be subjected to harsh chemical environments that could affect the service life of the adhesive and cause it to fail prematurely. Below there are common cable clips that can be used to install HDC cable:



Linear Heat Detection Cable T-clips	
Product number	FFS06435137

“T” Clip is used to fix heat detector cables to surfaces that are suitable for drilling i.e. wood and concrete. Recommended spacing 1 per meter. If needed cable ties for extra support may be used.