BASED ON EN 54-14 PROJECT MANUAL

generating confidence

maxlogic & mavigard

fire and gas detection systems

Mavili Elektronik A.S. has been **GENERATING CONFIDENCE** for since 1987 with Mavili, Mavigard, Maxlogic, Maxlogic & Mavigard brand names.

The company which is improving continuously its service network infrastructure, has offices in Ankara, Izmir, Antalya, Diyarbakir, Samsun, Bursa, Istanbul (Europian side), Russian central office in Moscow and Factory showroom in Istanbul Perpa Trade Center.

Mavili products are exported in more than 60 countries and different regions in the world, in addition we always provide pre-sales and after sales support for our **CUSTOMERS AND DISTRIBUTORS.**

Mavili continues manufacturing high quality products and maintaining services by its dynamic staff. More than 250 people, composed of technicians and engineers, are working hard for **CUSTOMER SATISFACTION.**

mavili
ELEKTRONİK TİCARET VE SANAYİ A.Ş.

Certificates and Approvals

* The **ISO 9001:2015** Quality Management System of Mavili Elektronik A.S has been audited and conformed by LPCB (Loss prevention Certification Board) / ENGLAND.

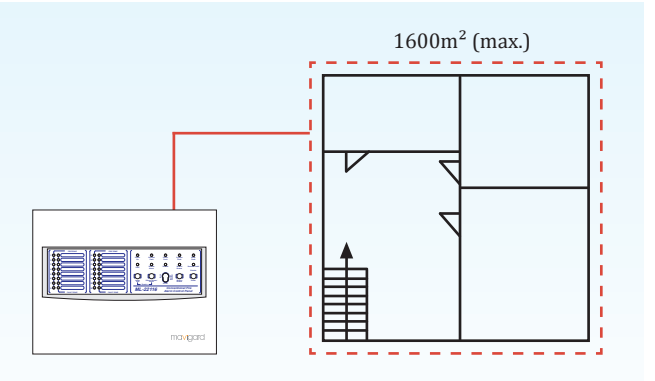
* Our Fire Detection and Alarm System products were **EN 54** and **CPR** certified by **LPCB** and **Dedal**, thus approving our quality by internationally accredited institutions.

* TSE / TURKEY (Turkish Standards Institute) entitled us to get **TS EN 54** certificates for Intelligent Addressable and Conventional Fire Alarm System products, **TS EN 50194** certificates for our gas detectors.

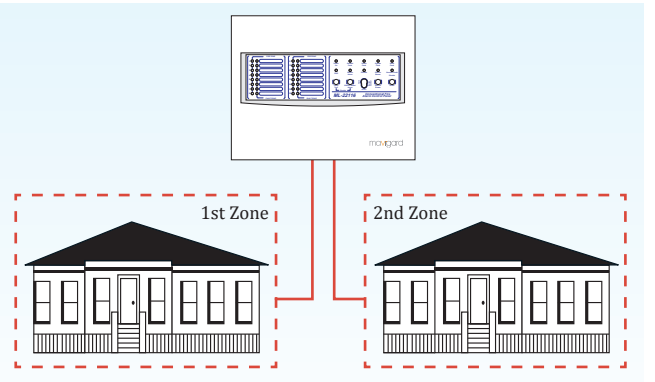
* OUR SERVICES are awarded with **TS 12849** for Place of Service and Sales Service Qualification certificate.

* All marine products have, **TURK LLOYD** (SOLAS 74 and FSS) and **IACS** (International Association of Classification Societies Ltd.) member **"Russian Maritime Register of Shipping"** type approval certificate.

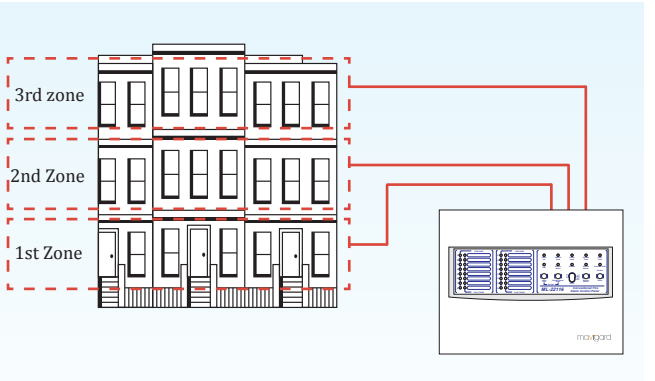
* Our products have Licenses for Usage from Ministries of many countries.



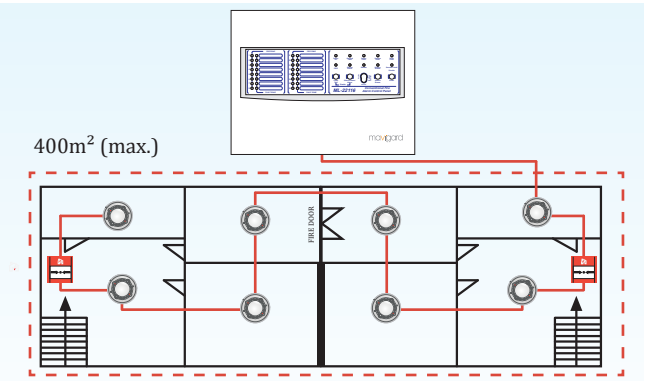
In conventional system, the largest zone area should not be over than 1600 m².



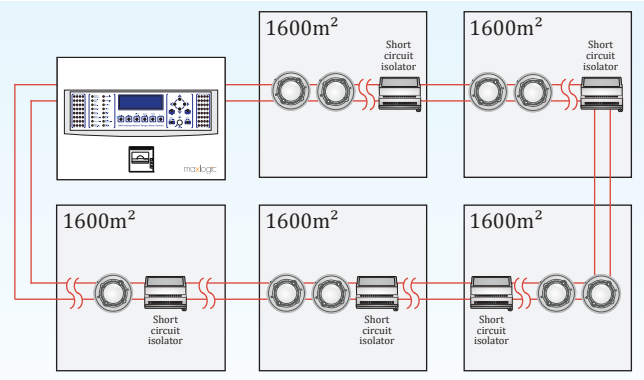
In conventional system, each building should be defined at least 1 zone.



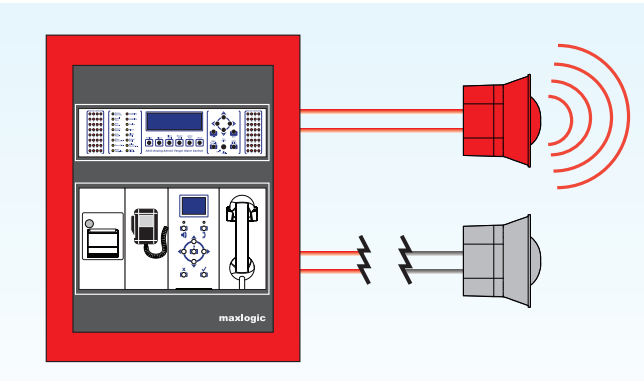
In conventional system, each story should be at least 1 zone.



In conventional systems, in case one zone covers more than one fire compartment, zone boundaries should match with the fire compartments and base area of the zone should not be over 400m².



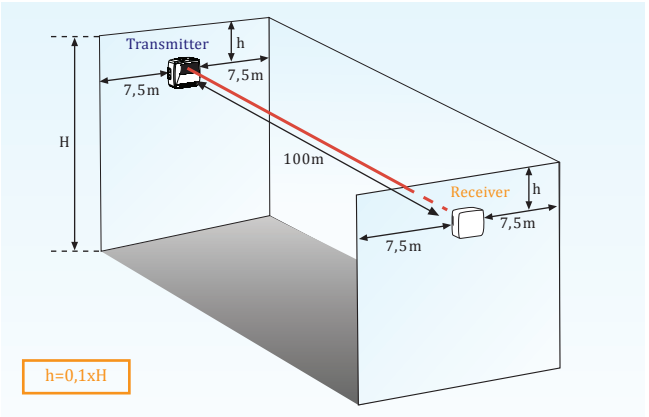
In addressable systems, the detection circuit should be designed so that no more than 20 addressable devices will be disconnected in case of short or open circuit.



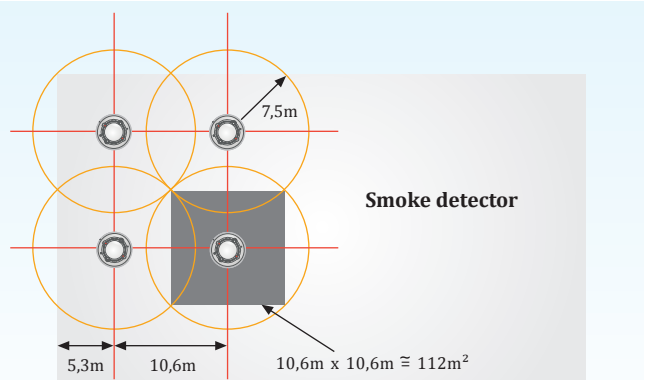
Audible and/or visual warning devices wiring should provide at least one audible and / or visual operating warning device in case of a short or open circuit in the system.

TABLE A.	Ceiling height (m)					
	≤ 4,5	< 4,5 ≤ 6	< 6 ≤ 8	< 8 ≤ 11	< 11 ≤ 25	> 25
Detector type	Operation radius (m)					
Heat Detector EN 54-5 Type A	5	5	5	NC	SA	SA
Photo-electric Detector, EN 54-7	7,5	7,5	7,5	7,5	NC	SA
Beam type smoke Detector, EN 54-12	7,5	7,5	7,5	7,5	7,5 *	SA
NC - Not applicable in given height range. SA - Used only for special applications.						
* Generally a second detector layer is required approximately at the half of the ceiling height.						

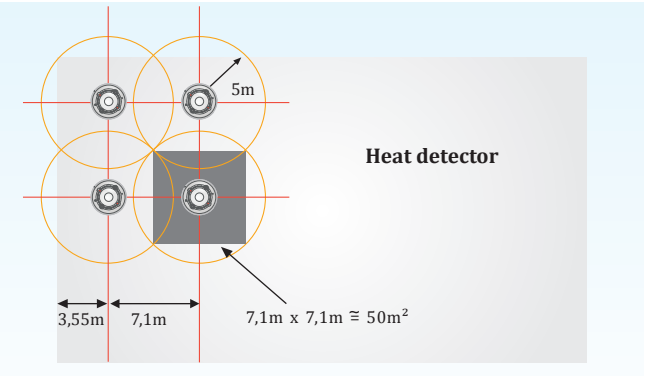
Limits of operation radius and ceiling height for fire detectors.



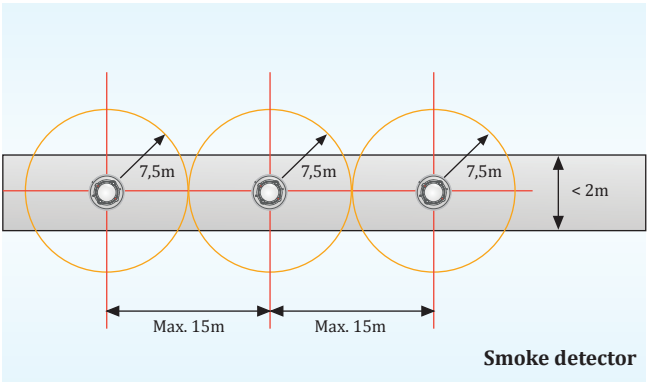
Beam type smoke detectors are composed of 1 receiver and 1 emitter. Receiver and emitter should see each other in max. 100m distance. Receiver and emitter horizontally protects 7.5 m in both sides. With 1 pair of beam detector approximately an area of 1500m^2 can be protected.



A smoke detector covers a 7.5 m radius circle area. To avoid "blind points" among coverage areas, detectors' coverage areas should be overlapping as shown in the figure above. Thus, every detector covers a square of 10.6m x 10.6m, equaling to 112m².

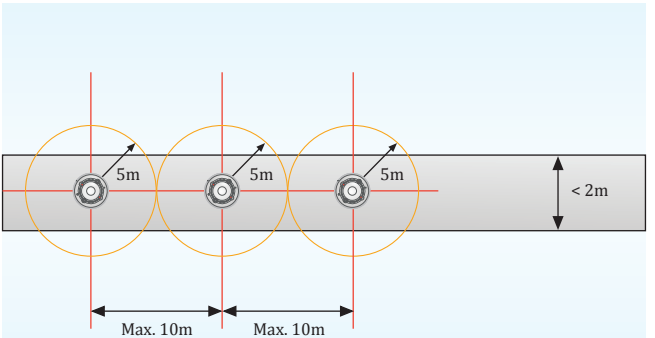


A heat detector covers a 5 m radius circle area. To avoid "blind points" among coverage areas, detectors' coverage areas should be overlapping as shown in the figure above. Thus, every detector covers a square of 7.1m x 7.1m, equaling to 50m².



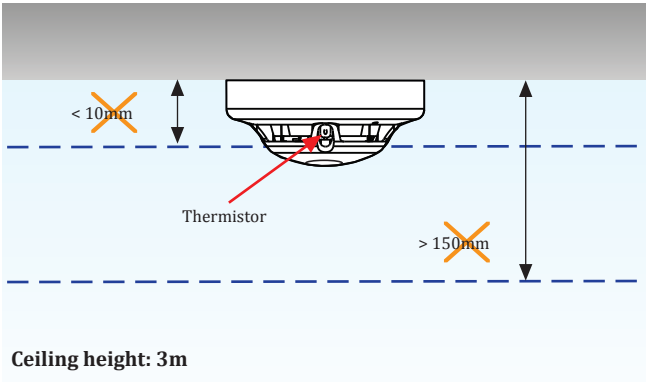
Smoke detector

If corridors have less than 2 m width, smoke detectors can be mounted max. 15 m gap. There is no need to overlap the coverage area of the detectors. If corridors have more than 2 m width, smoke detectors are mounted in 10 m gaps according to the Table A.



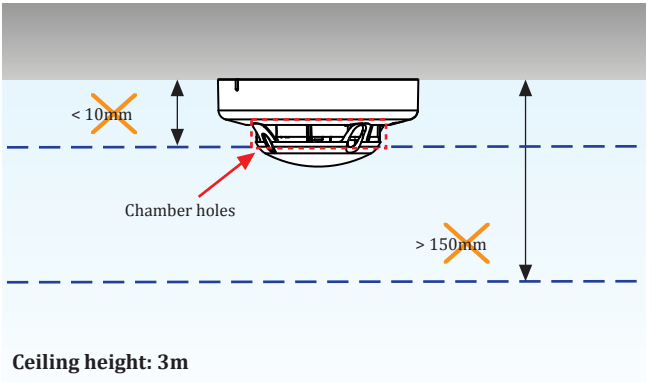
Heat detector

If corridors have less than 2 m width, heat detectors can be mounted with max. 10 m gap. There is no need to overlap the coverage area of the detectors. If corridors have more than 2 m width, heat detectors are mounted with 7 m gaps according the Table A.



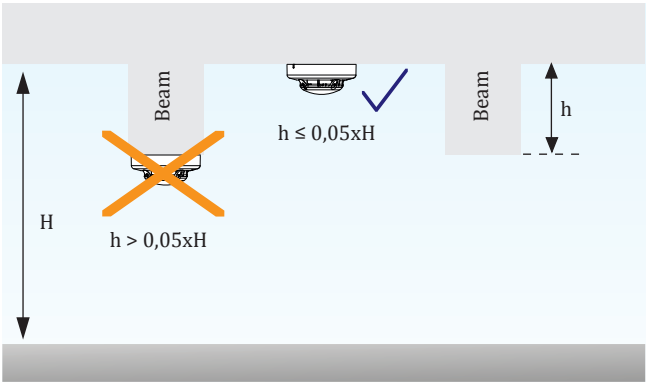
Ceiling height: 3m

Due to cold air layer present just under the ceiling, heat detectors should not be deeply mounted all the way into the ceiling and should be in the range of 5% of the ceiling height to provide healthy operation of the thermistor.

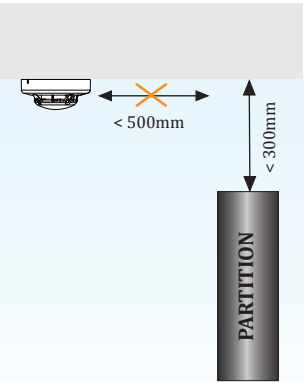


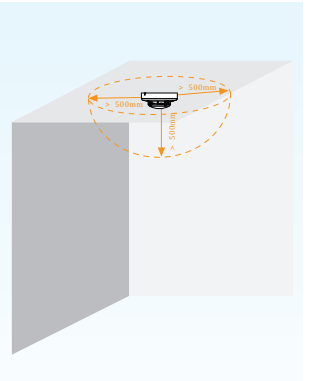
Ceiling height: 3m

Due to cold air layer present just under the ceiling, smoke detectors should not be deeply mounted all the way into the ceiling and should be in the range of 5% of the ceiling height to provide healthy operation of the optical chamber.

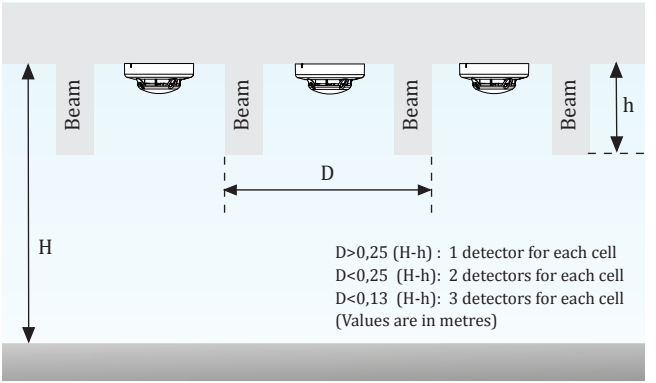


Detectors should be mounted in the range of 5% of upper part of the room height.

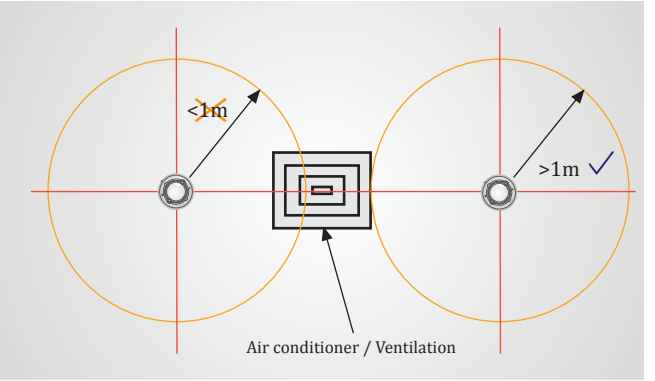




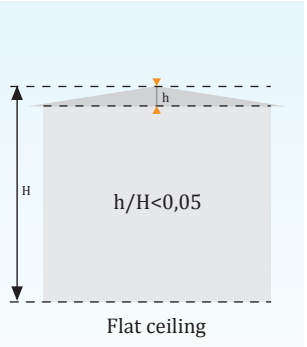
Detectors should be mounted 500mm away from walls or partitions. If the top edge of walls, partitions, racks etc. are less than 300mm from ceiling, they are accepted as walls. In every vertical downward and horizontal direction from a detector, 500mm gaps should be provided.

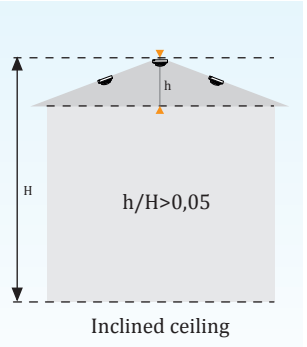


If the beam height (h) is 5% less than ceiling height (H), ceiling should be treated as flat and radius values in Table A should be applied. If the beam height (h) is 5% more than ceiling height (H), then the conditions in the figure should be applied.

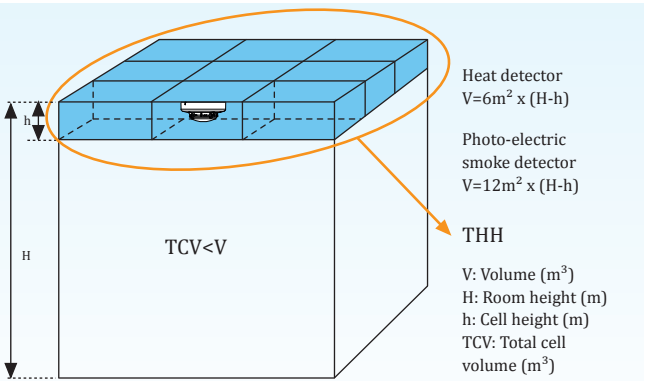


Detectors should not be mounted adjacent to an air inlet if it is closer than 1 m or if there is an air flow in the medium more than 1 m/s.

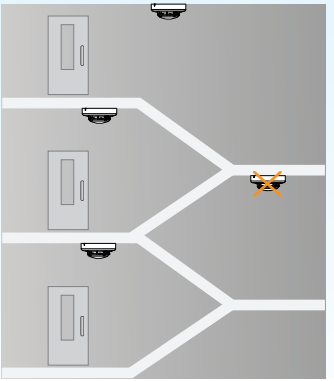




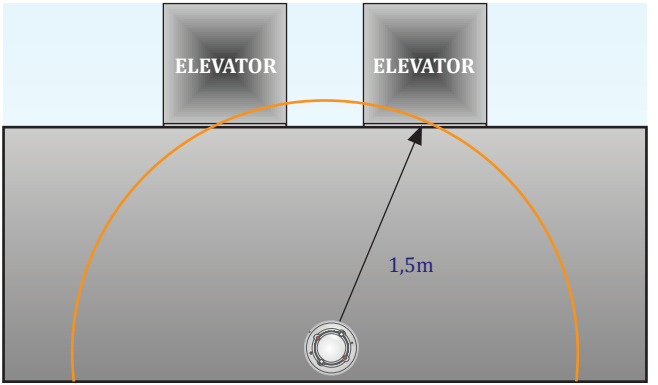
If the ratio of "h" and "H" is less than 5%, ceiling is accepted as flat and detectors are mounted according to the radius values of the Table A. If the ratio of "h" and "H" is bigger than 5%, ceiling is accepted as inclined and for each degree of the ceiling slope, detectors are mounted by modifying the radius values of the Table A. Radius values can be modified up to 25% of the actual values.



If the ceiling is composed of a group of cells, a point type detector within the limits of radius in the Table A can enclose a group of cells. However, the total volume of cells enclosed by a detector should not exceed the V value in figure.



Main stories of each stairs landing, 1 detector should be placed.



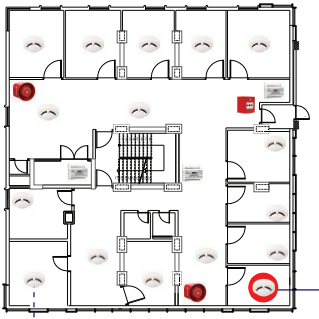
Detector should be mounted inside area of circle, enclosing elevator doors, which has 1.5 m radius.

Supervisor Graphic Monitoring and Control Software Intagrated with environmental Systems and Managing

Supervisor; is a specially designed software which shows fire and fault events and makes possible to monitor and control the fire alarm system as in architectural and graphical way.

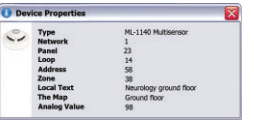
IP cameras at the point where the fire alarm is activated in case of fire within the scenario can be automatically turned on or manually controlled with IP camera systems working with ONVIF protocol via software integration.

- 1000 different intelligent addressable fire detection system can be monitored and managed with single supervisor.
- Projects on computer can be transferred to system as maps (all picture formats).
- Determined areas can be monitored graphical and it provides to exchange between maps in case of fire and fault events.
- Remote commands can be sent in situations that require intervention.
- Animations, device types and event voices can be changed by users.
- In case of fire and fault events; e-mail and/or sms report can be sent to the authorized people at determined periods or instantly.
- The communication between PC and fire alarm system can be done via RS-232 or RS-485 and for longer distance GPRS or TCP-IP ports can be used.
- All events records can be monitored, filtered, printered, back-up with date/time information by Supervisor.
- 10 different users can be defined.



Arhitectural site plans of the building are defined to the Supervisor graphic software program as maps and all the fire alarm system devices are figured on these maps.

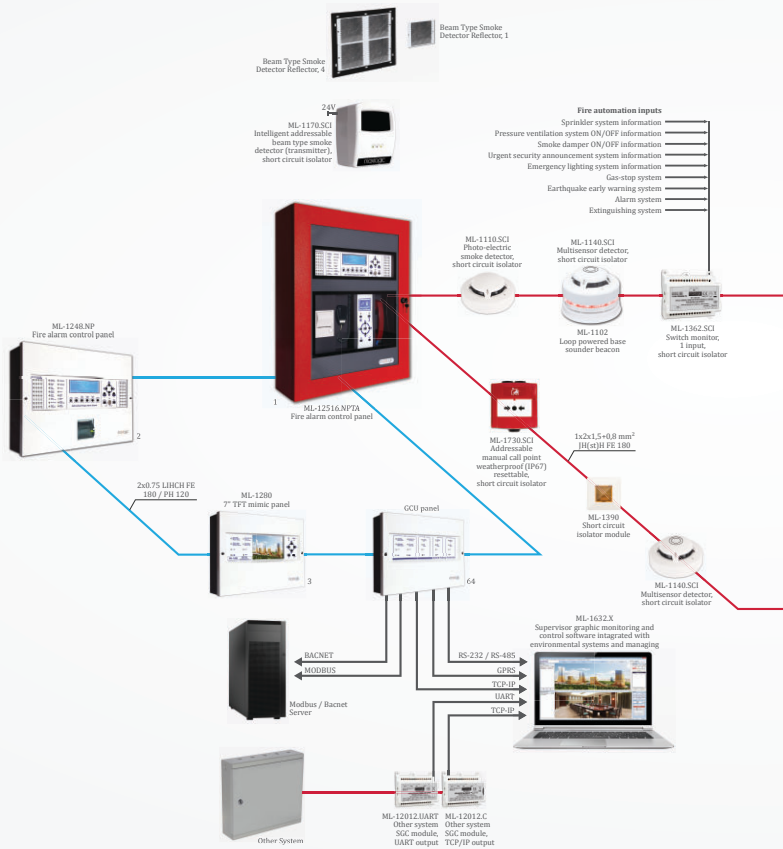
In case of any event, the event location map is shown on screen and detailed alarm information is provided to the user for exact determination.



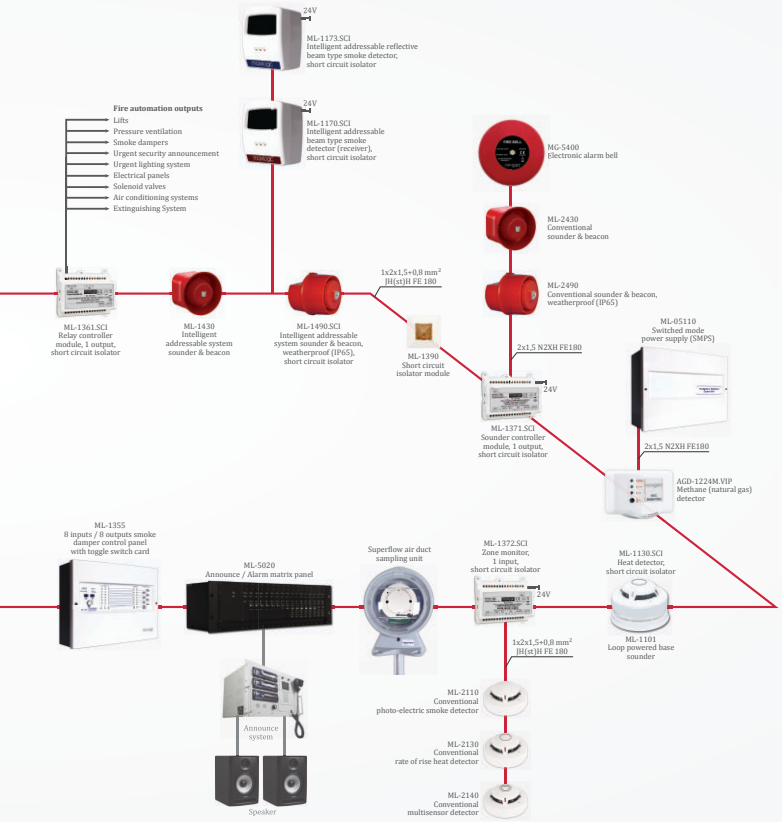
Possibility to communicate with other panels telephone modules ad firefighter's telephone units. Also, conference call can be done all telephones within network.

Can be integrated to all kinds of CCTV systems, (all brands and models) with remote monitoring software.
In determined areas present CCTV cameras can be monitored manually or automatically through automation ability.

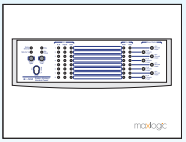
With ONVIF integration, fire detection system can be software integrated and operate with all ONVIF based security systems.



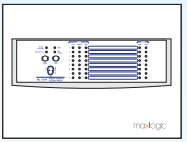
- Maxlogic addresaable fire detection system can work as network up to 64 panels.
- Thus can be easily applied in big sites such as hospital,warehouse,university etc.
- Max. 130.048 devices can be used in Maxlogic Addressable fire detection system.



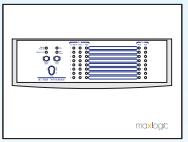
- All events can be monitored from any panel in network.
- All panels can be controlled from any panel in network.
- Cause-effect scenarios can be created between devices that are located in network.



Intelligent Addressable System
Smoke Damper Control Panel
c/w 16-way I/O Module
(8 Input / 8 Output)
c/w Toggle Switch Card



Intelligent Addressable System
Smoke Damper Control Panel
c/w 16-way I/O Module
(8 Input / 8 Output)

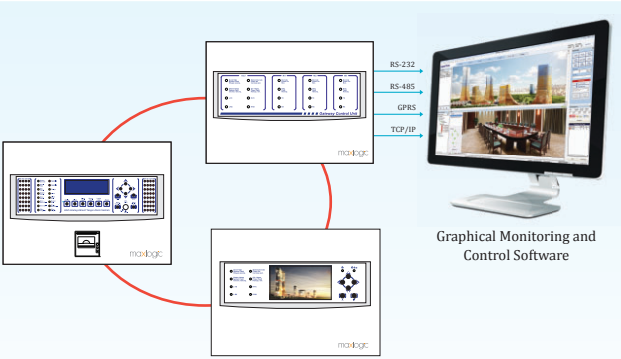


Intelligent Addressable System
16-way I/O Panel
(8 Input / 8 Output)

Detections, alarms and other signals can be used to trigger assistive devices as mentioned below.

a) Fire Extinguishing Equipments,
b) Smoke or Fire doors,
c) Smoke Ventilation Equipments,
d) Smoke or Fire Dampers,
e) Closure of ventilation,
f) Lift Control,
g) Security Doors

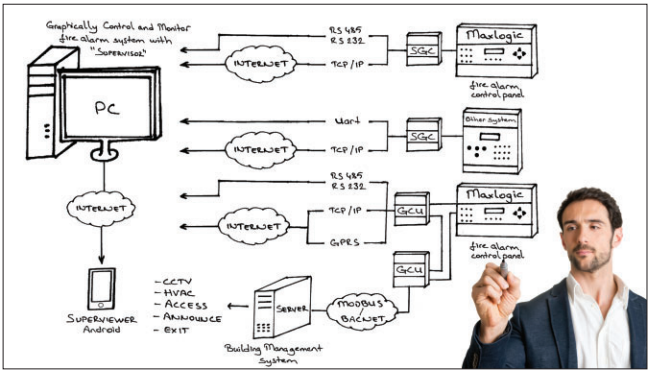
Fire alarm system or other assistive devices shouldn't be hindered in case of any assistive devices fails.



Graphical Monitoring and Control Software

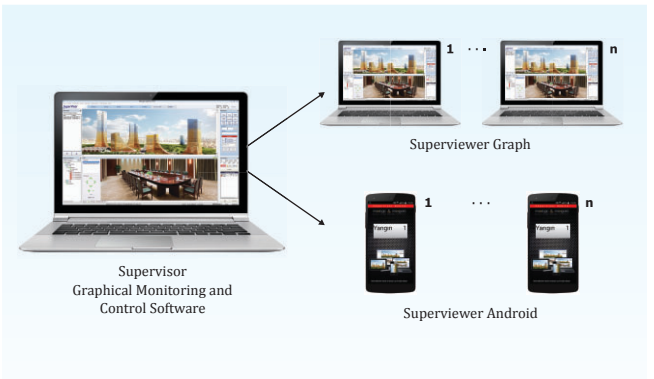
Mimic Panel

Control and Monitoring devices should be possible to relate easily and without any difficulties with location of detector or manual callpoint.

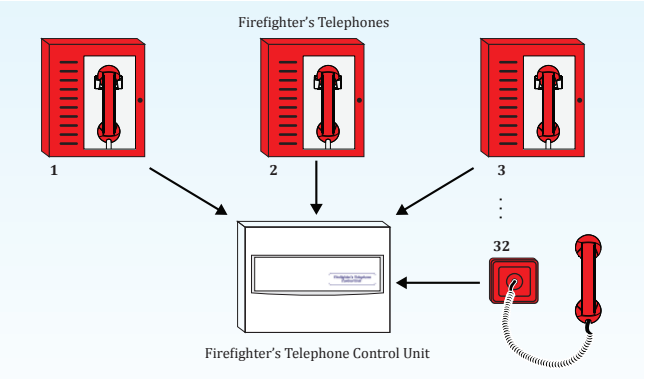


For the communication with supervisor, GCU panel uses RS-232, RS-485 for close access, IP based communication like GPRS and TCP/IP communication modules for longer distance.

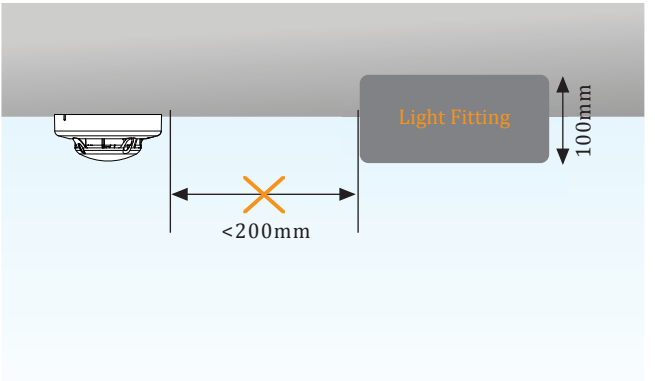
With UART connection cable for short distance access, with TCP/IP via internet for long distance TCP/IP can be connected to Supervisor.



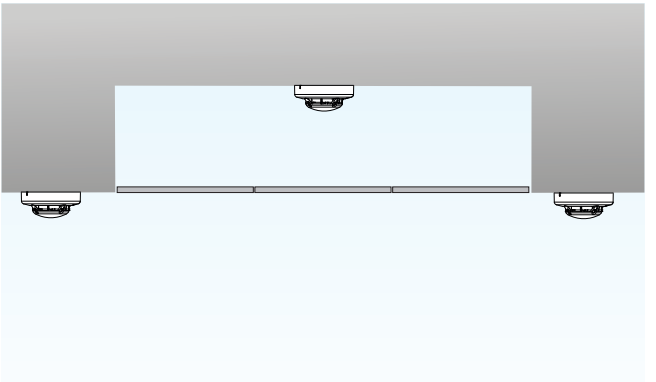
Superviewer Android software enables monitoring and control of fire alarm system without the user's need to be at the computer.



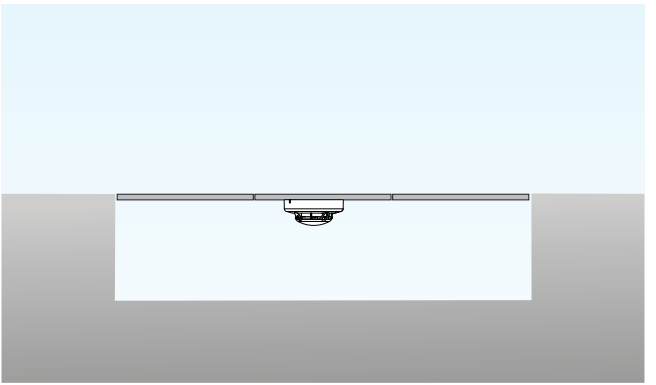
In case of an emergency, lifting a handset of firefighter's telephone or inserting a portable firefighter's telephone handset in the socket and without the need of dialing any number automatically calls the security center by "hot line" feature.



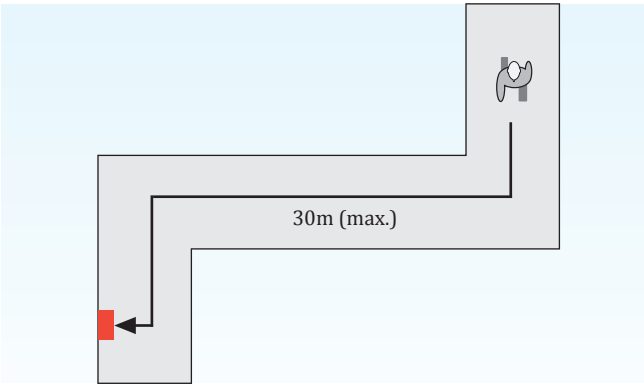
Detectors should be mounted two times far away from the light fitting height.



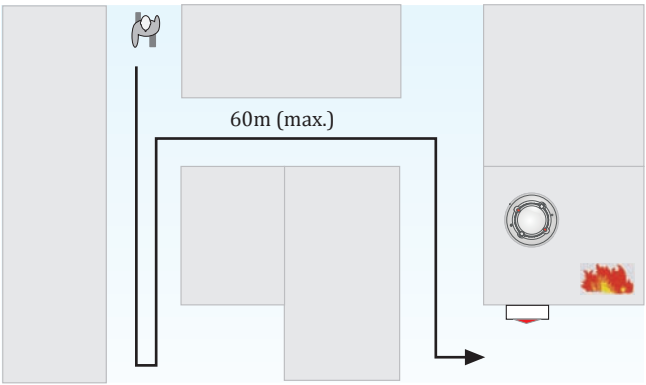
In case of a fire risk above the false ceiling, fire detectors (at least 1 per each independent zone) should be mounted above the false ceiling according to the values in the Table A.



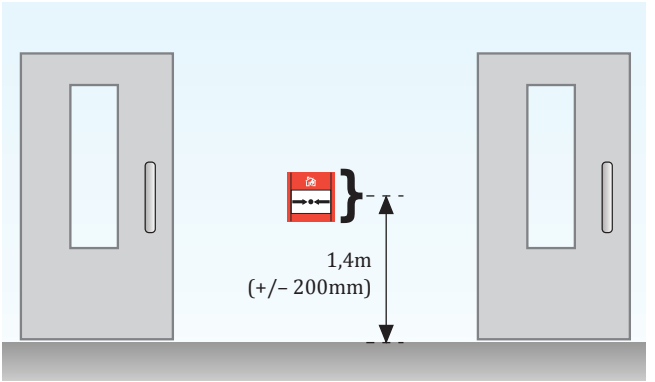
In case of a fire risk below the raised floor, fire detectors (at least 1 per each independent zone) should be mounted below the floor according to the values in the Table A.



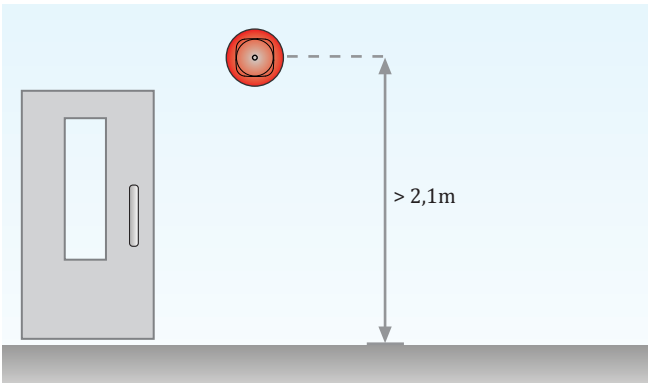
Manual call points should be mounted at walking distance up to 30 m. MCP are also placed near the escape routes.



In case of searching fire source in the zone, 60 m. walking distance never be exceeded.

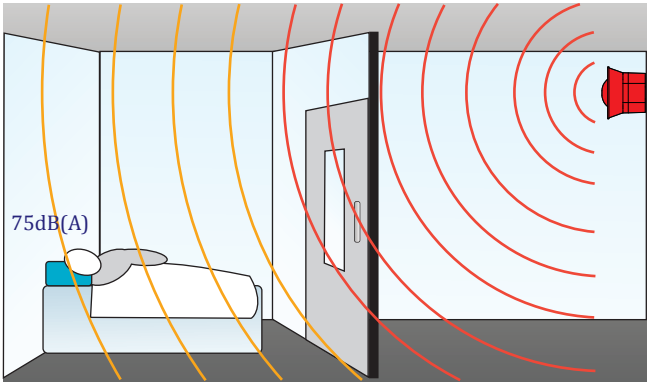


Manual call points should be mounted on 1.4 m (+/-0.2) height from the floor.

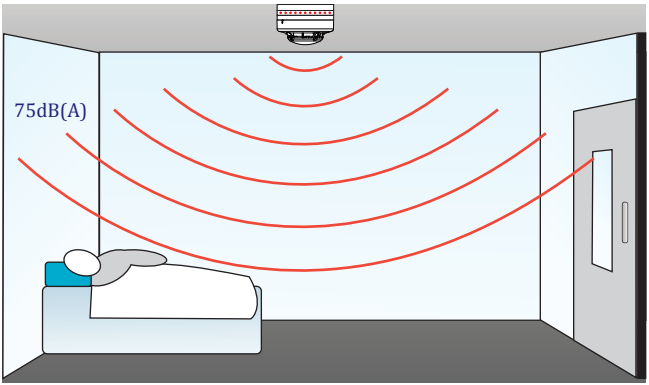


Audible and / or visual warning devices and remote indicators should be mounted at 2.1 m height from floor and cables should be properly protected.

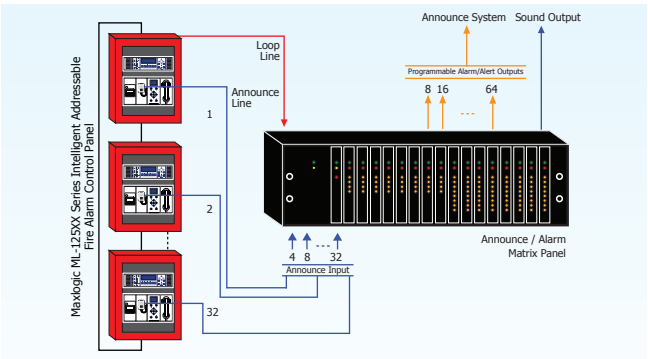
Fire alarm sound level should be in 500 Hz-2000 Hz frequency range and at least 65 db(A) or 5 dB(A) more than medium noise which may present for longer than 30 sec. Fire alarm sound level should not exceed 120 dB(A) for places where people are present.



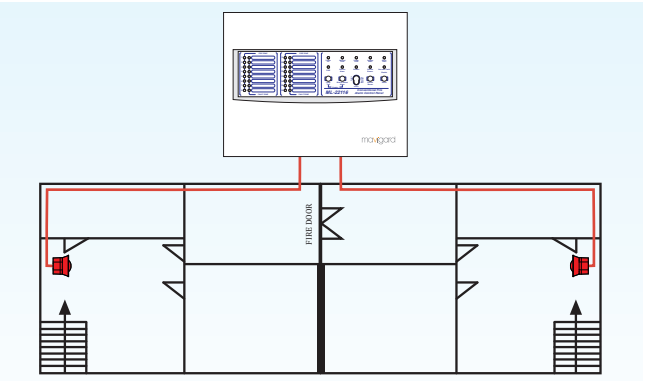
Minimum alarm sound levels can be heard from the all needed places. Alarm devices should be enough quantities in order to provide suggested alarm sound level.
To wake sleeping people up, fire alarm sound level should be at least 75 dB(A) at the edge of the bed.



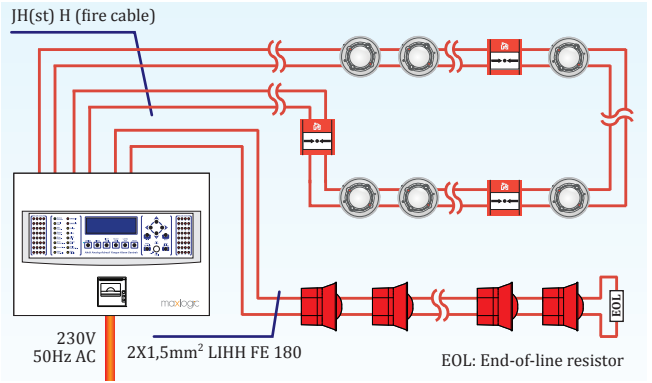
To wake sleeping people up, fire alarm sound level should be at least 75 dB(A) at the edge of the bed.



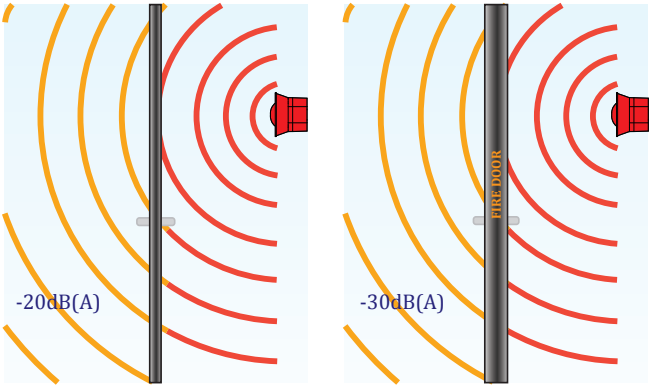
One or more microphones should be defined as a fire microphone if fire status message is needed to provide by a person. Fire microphones access should be limited with only authorised people.



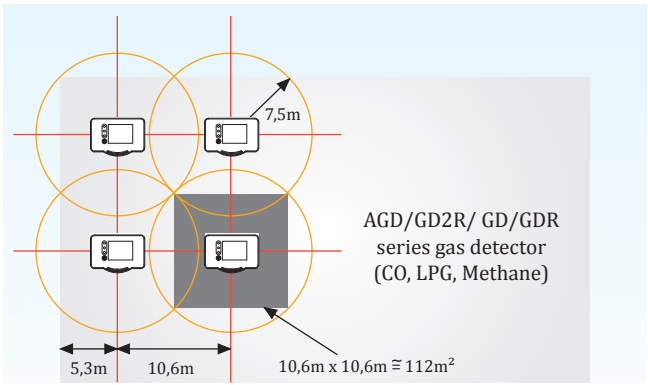
In each fire compartment, there should be at least one audible warning device.



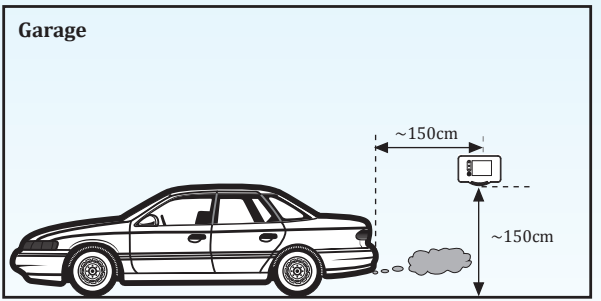
Wiring used in fire detection system should endure effects of fire and fire suppression for at least 30 minutes or be properly protected to provide such endurance.



The loss in sound level in normal doors 20dB(A), in fire doors 30dB(A).

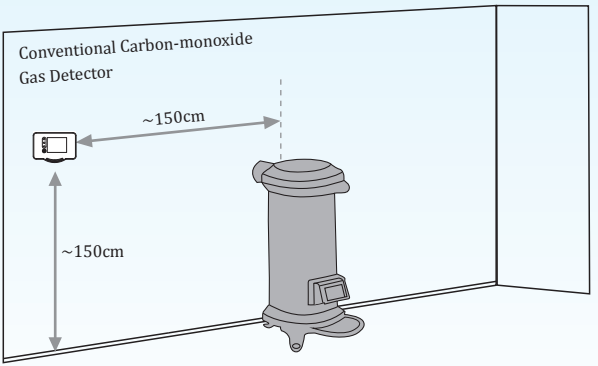


A gas detector has detection coverage of 7.5 m radius circle. To prevent any "blind points" among the coverage areas, they should be overlapping as shown in the figure above. Thus, every detector covers a square of 10.6m x 10.6 m, equaling to 112 m2 area.

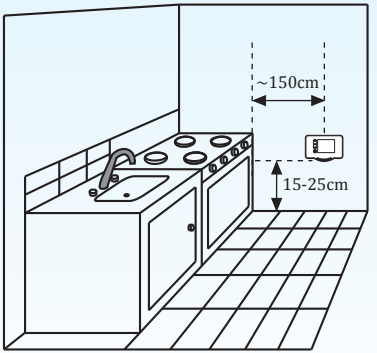


Mounting CO detector

Carbon monoxide (CO) is a poisonous and explosive gas. Since it has relative density of 0.97 when compared to air (= 1), gas detector should be mounted 150 cm above floor and 150 cm away from the gas source.

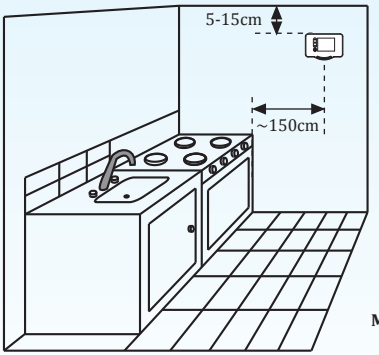


Highly poisonous gas, carbon monoxide, occurs on incomplete combustion. It is difficult to detect, because it is colorless and odorless. It blocks oxygen in blood cells and, when breathed in high concentrations, may cause fatal poisoning.



Mounting LPG detector

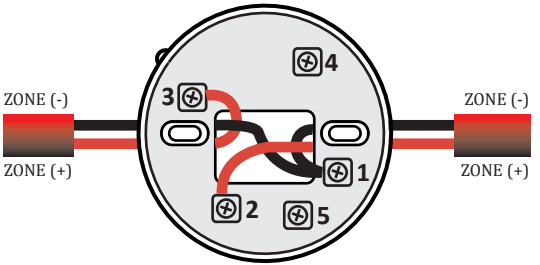
LPG is an explosive hydrocarbon gas consisting of butane and propane. It is heavier than air and sinks to floor in case of leakage. Therefore, an LPG detector must be mounted 15-25 cm above floor and within 1-2 m horizontally within the range of possible gas leakage.



Mounting naturel gas detector

Methane (natural gas) is an explosive hydrocarbon gas. It is lighter than air and rises to ceiling in case of leakage. Therefore, a natural gas detector must be mounted 5-15 cm below ceiling and 150 cm horizontally within the range of possible gas leakage.

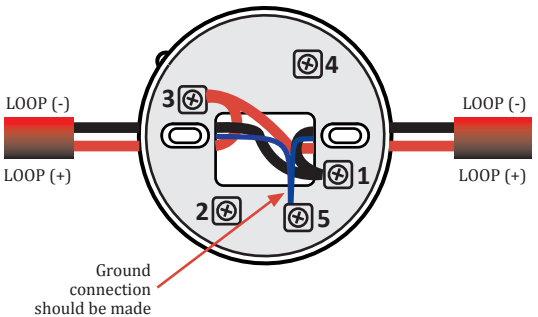
CONVENTIONAL SYSTEM



Connect end-of-line resistor to the last device on the zone.

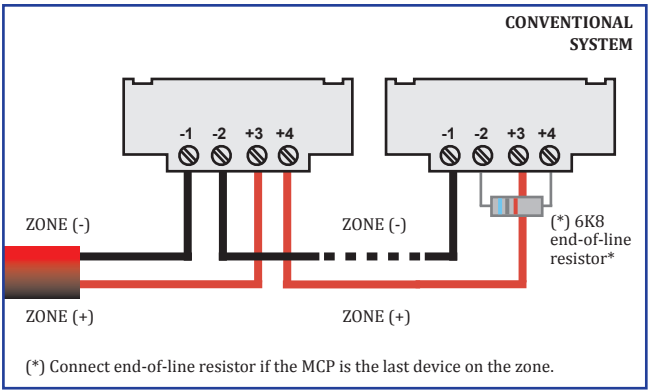
Detector base (ML-0140) wiring in conventional system.

INTELLIGENT ADDRESSABLE SYSTEM

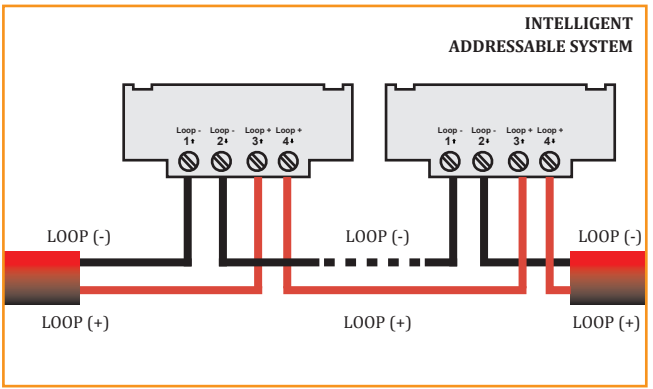


Detector base (ML-0140) wiring in addressable system.

* Please contact for short circuit isolated detector base connection diagram.



The connection diagram of conventional manual call point (ML-2710).



The connection diagram of addressable manual call point (ML-1710).

www.mavili.com.tr/en

www.city-groupco.com

ALARM CITY

Security Systems & Technology Solutions

A **CITYGROUP** *Company*

info@city-groupco.com