Integrated Fire Safety and Security Solutios

Fire and Gas Detection Systems

Solution Partner
Building Technologies

SIEMENS

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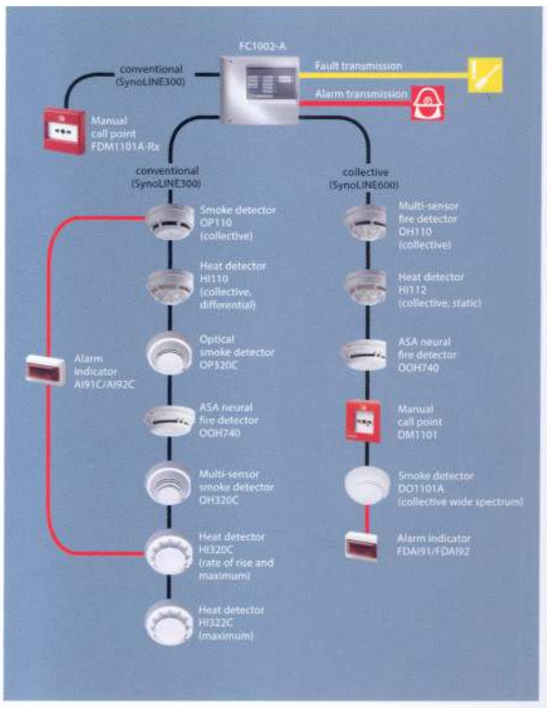
ARDAL ENGINEERING CO.

Conventional Fire Alarm System

Conventional Fire Alarm Systems are a well-proven technology protecting many hundreds of thousands of properties worldwide. A Conventional Fire Alarm System is often the natural choice for smaller systems or where budget constraints exist.



Highlights:

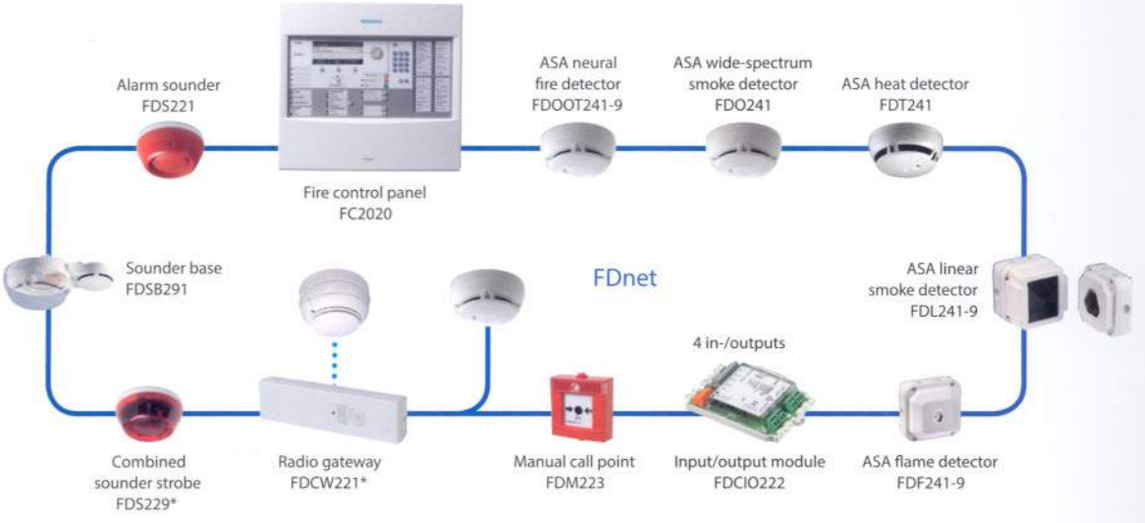
- Control Panel can be programmed to delay communication with the fire brigade for automatic alarms in "manned" mode.
- Conventional detectors & special detectors such as flame detectors & linear smoke detectors can be connected to the control panel.
- System testing and isolation can be performed with confidence using the comprehensive array of clear, concise controls and indicators.

Addressable Fire Alarm System

For Standard & Sophisticated Applications

Analogue Addressable Fire Alarm Systems differ from conventional systems in a number of ways and certainly add more flexibility, intelligence, speed of identification and scope of control. For this reason Analogue Addressable Fire Alarm Systems are the natural choice for larger premises and more complex system requirements.

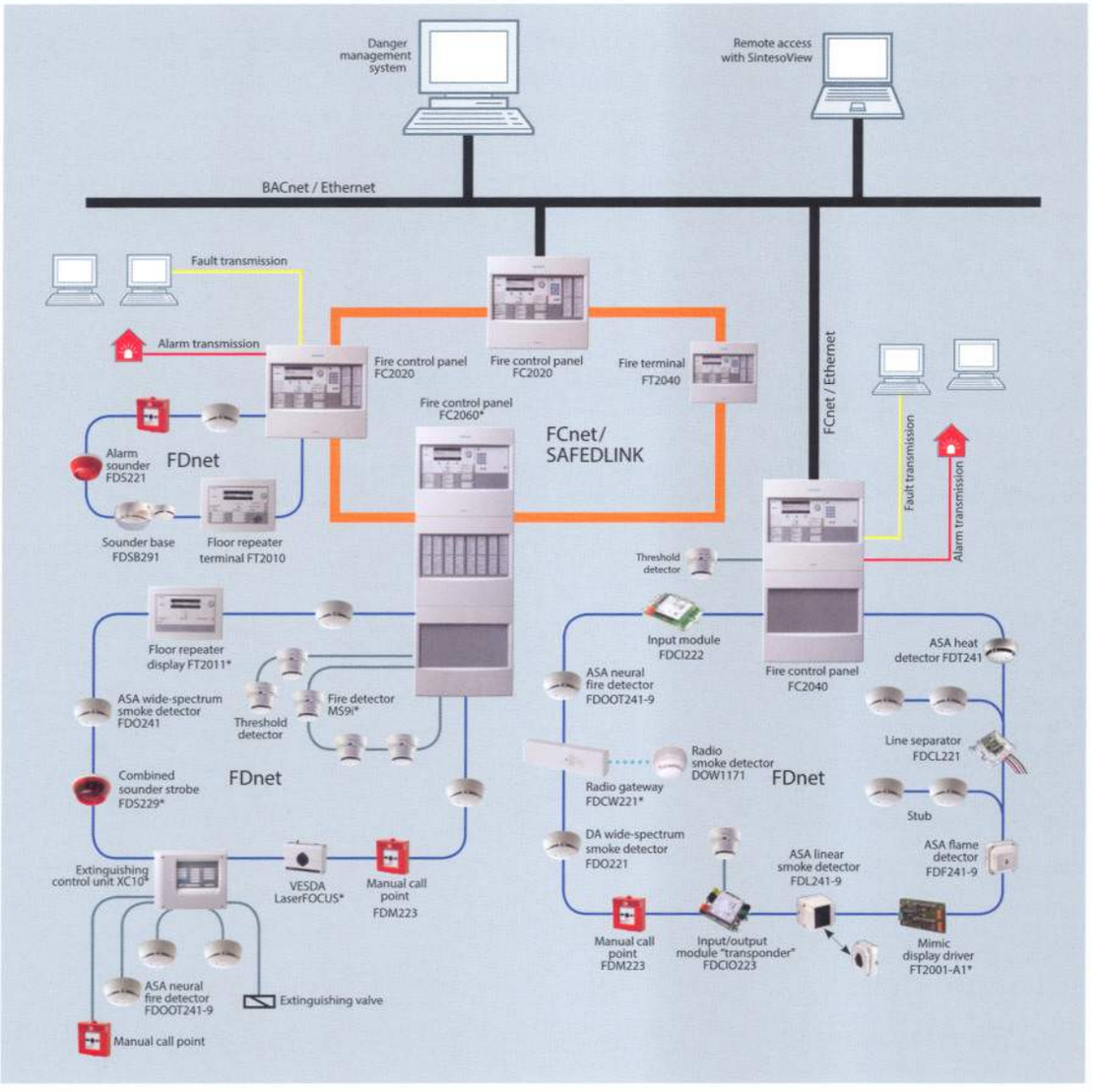
Standard Applications, Stand Alone



Highlights:

- All peripheral elements, including the alarm sounders, are Loop-Powered
- Integration of conventional fire detectors
- The control panels can be accessed via Ethernet and a standard PC using the PC software Up to 126 devices on the FDnet
- Loop length up to 3.3 km.

Sophisticated Applications, Networked (MM8000)



Highlights:

- Comprehensive system including Extinguishing Control Unit, Air Sampling Smoke Detection, Repeater Panel, Flame Detector, Beam Detector, & …. On the loop.
- Simple networking of control panels and fire terminals – up to 32 FCnet stations.
- The distance between two stations can be up to 1,000 m, or even considerably more if fiber-optic cables and network repeaters are used

Selecting Desired Control Panel

Model	FC721	FC722	FC724	FC726
Concept	Compact	Compact	Compact	Modular
Networking	No	Yes	Yes	Yes
No. of Loops*	1	2	4	4
No. of Loops (with Loop Extension)	-	4 (252 addresses)	8 (504 addresses)	Up to 28** (1512 addresses)
Integrated I/O	4	8	12	12
Features	• Ethernet interface for easy connection • Floor repeater terminals on the C-NET • Remote access allows central operation via Ethernet • Modular housing for attractively expanding system			

* No. of addresses per each loop: 126

** With card cage for 5 add. modules

Integrated Fire & Gas Detection System

SIL2 & SIL3 Applications

The S81-HS panel looks like a safety PLC but, differently from this, it is certified, by European bodies, to perform the envisaged protection functions in compliance with the applicable regulations.
The panel is composed of specialized cards, installed in 19" racks, whose type and quantity depends on specific application requirements, i.e. on the plant/equipment to be protected.
The cards, which have their own "intelligence", are programmed for active / passive fire protection, gas detection, detection,intruder alarm and technologic control management.
Moreover, the S81-HS can interact with other panels of the same type, as well as with supervisory and SCADA systems, through both proprietary and standard protocols, such as Ethernet TCP/IP and Modbus.

Fire Detector Compatibility Table

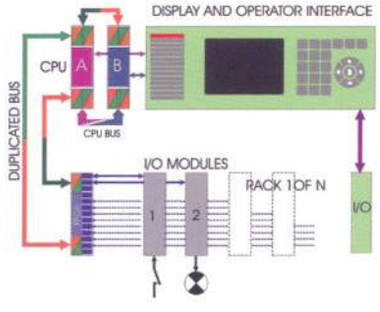
	Conventional	Addressable
Non SIL System	Hochiki & Apollo	Hochiki & Apollo
SIL 2 System	Hochiki & Apollo	Hochiki & Apollo
SIL 3 System	Hochiki & Apollo	-

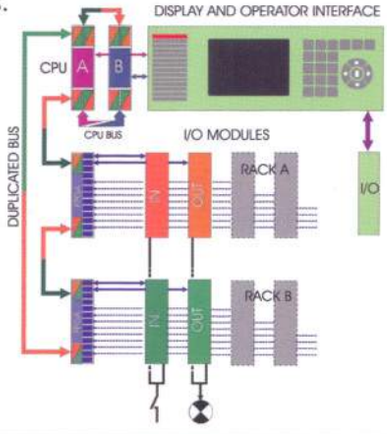
Features:

- Addressable Fire Detection
- Conventional Fire Detection
- Gas Detection System
- Extinguishing System
- Provides Modbus interface to DCS
- Provides Ethernet link for PC's
- Allows for various levels of redundancy
- Modular rack panel
- Cabinet sized to need

SIL, Concept & Configuration

SIL 2 Configuration(SINGLE/MONO)	SIL 3 Configuration(REDUNDANT/DUPLEX)
The I/O cards need not be duplicated. The I/O cards not relating to SIL2-certified safety functions need not be duplicated.	In case of automatic fire extinguishing control,sensor must be installed on two different detection lines. The I/Ocards concerning SIL3-certified safety functions must be duplicatedin different racks. Consequently, also the racks are duplicated. The redundant I/Q cards must be evenly spread in the redundant racks.



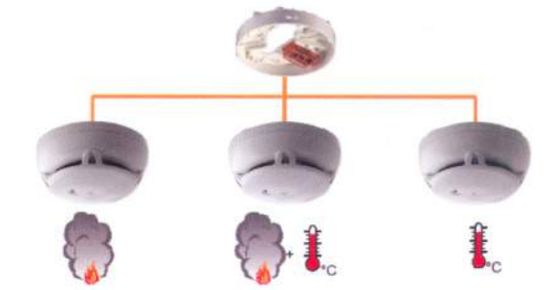


Conventional & Addressable Fire Detectors

Point Type Detectors

Fire detectors are ideal for any application area, from clean and sensitive environments like data centers to robust environments with many deceptive phenomena like industrial production facilities.
Thanks to their intelligent technology of Cerberus PRO family, the fire detectors quickly and reliably analyze the main criteria for fire; that is, smoke, heat and Flame. Point type fire detectors are divided into three basic types:

- Multi sensor smoke detector
- Smoke detector
- Heat detector



ASA Wide-Spectrum smoke detector | ASA neural fire detector | ASA heat detector

Flame Detector

Flame detectors are optical fire detection devices, which are able to detect infra-red and/or ultra violet radiation given off from a flaming fire.
Flame detectors are ineffective for slow smoldering fires where traditional smoke detectors would be more suitable however flame detectors will generally respond far quicker to rapidly developing fires such as combustible gases and liquids etc.
Flame detectors come in many sizes and variations but generally fall into three groups: UV, IR & UV/IR.

ATEX

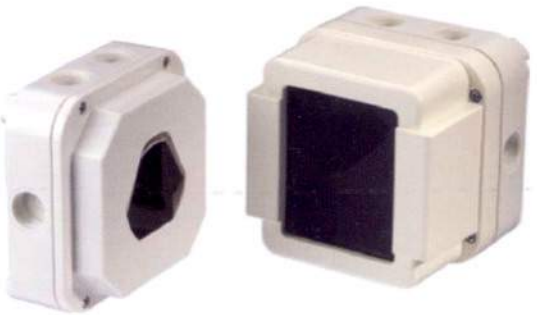
Recommended Types of Flame Detectors

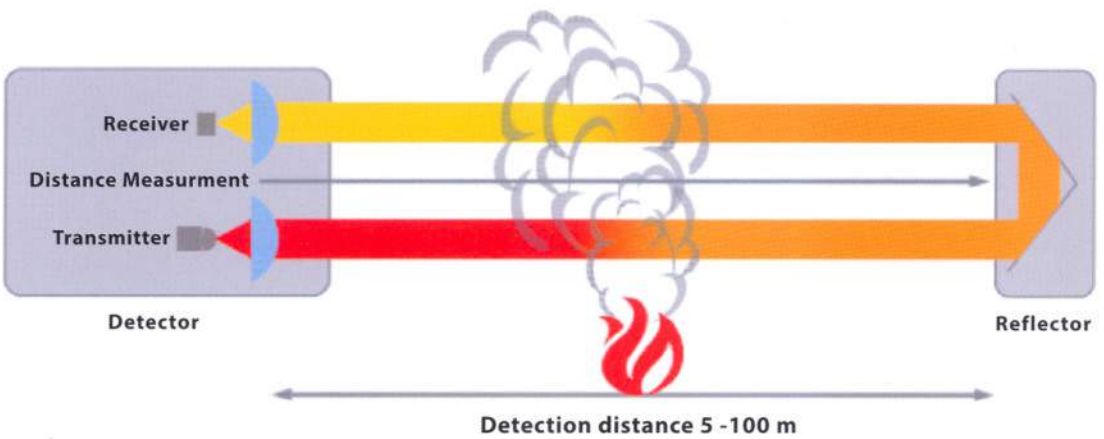
Fire Source	Detector Type			
	UV	IR	UV/IR	IR3
Gasoline	1	1	1	1
Diesel Fuel	2	2	2	2
N-Heptane	1	1	1	1
Alcohol (Ethanol)	2	2	2	2
Methane	2	3	3	3
LPG	2	3	3	3
Hydrogen	2	4	3	4

(1) 100%-75% of the detector sensitivity
(2) 75%-50% of the detector sensitivity
(3) 50%-25% of the detector sensitivity
(4) Not suitable

Linear Smoke Detector (Beam Detector)

The detector consists of a light emitter and a light receiver. The light emitter emits a bundled infrared ray, which is scattered back by the prism-shaped reflector to the light emitter.The receiver converts the received infrared signal in an electric signal, which is evaluated by the microprocessor-controlled electronics.
Smoke penetrating the measuring section attenuates the infrared signal.When the signalreaches predefined measuring values, thedetector transmits the corresponding dangerlevel to the control unit.





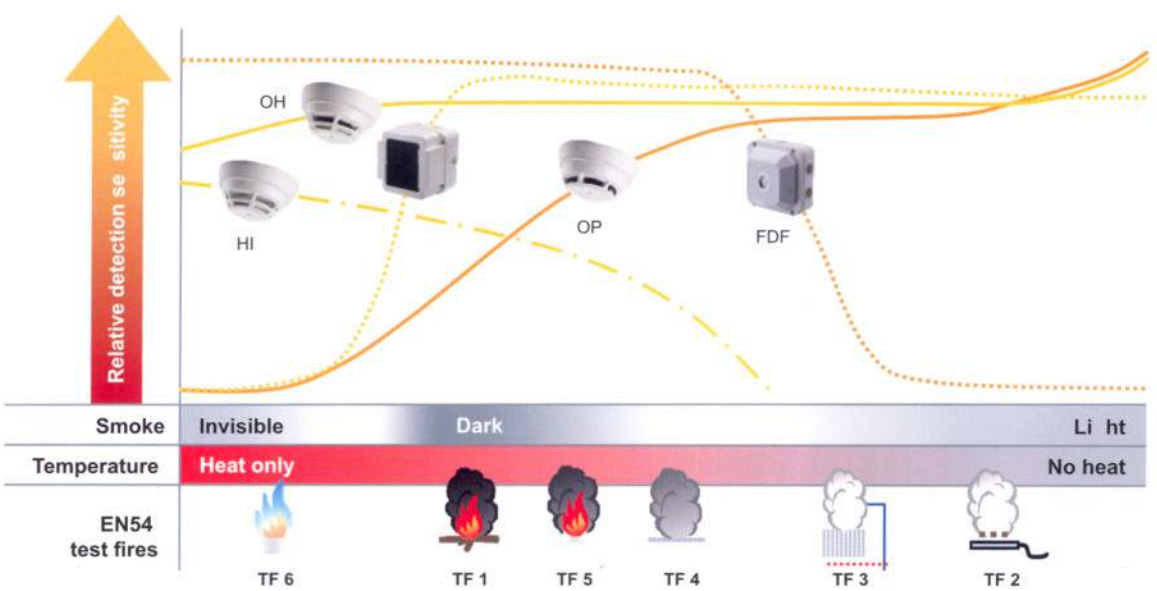
3 Different reflectors are available to meet any requirement:

1. Reflector for short distance (10-30 m)
2. Reflector for middle distance (30-65 m)
3. Reflector for long distance (20-100 m)

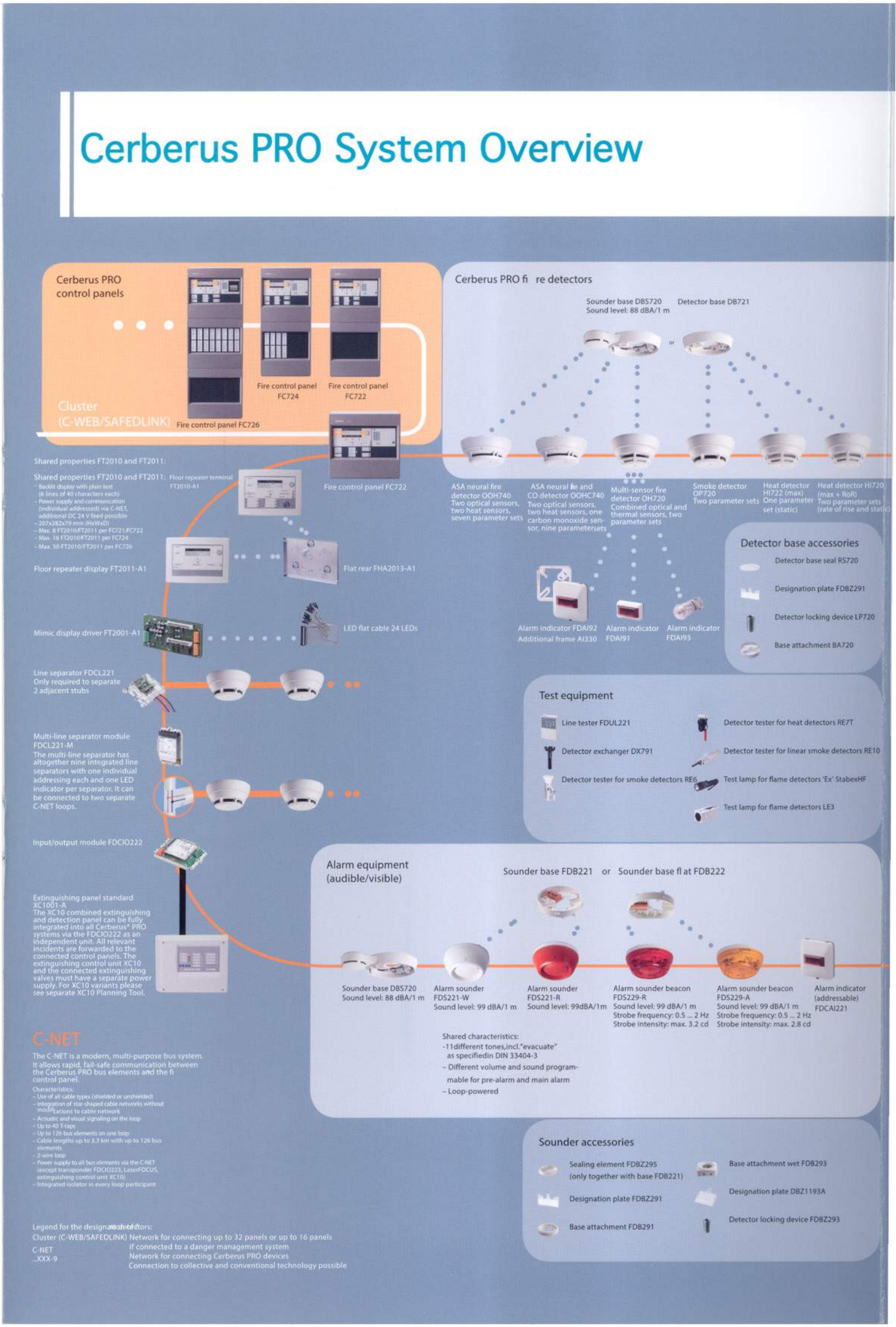
Applications:

- Areas with complex roof structures or historically valuable ceilings
- Large store-rooms and production workshops
- Atrium-type buildings
- covered courtyards
- Reception Halls

Comparison of the sensitivity between different types of Fire Detectors according to EN54 Test Fires



Cerberus PRO System Overview



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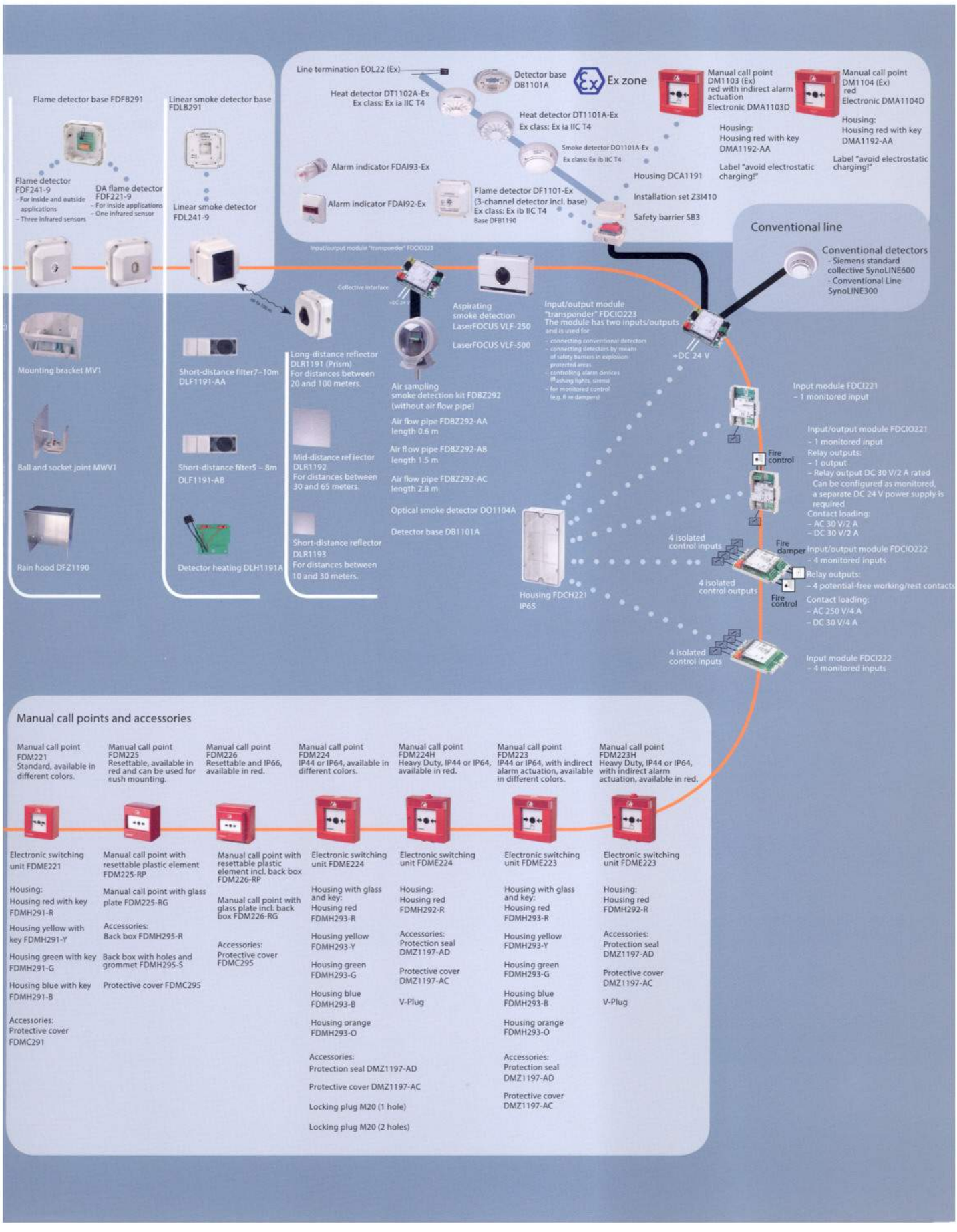


Manual call points and accessories

Manual call point FDM221
Standard, available in different colors.

Electronic switching unit FDME221

Housing:
Housing red with key FDMH291-R

Housing yellow with key FDMH291-Y

Housing green with key FDMH291-G

Housing blue with key FDMH291-B

Accessories:
Protective cover FDMC291

Manual call point FDM225
Resettable, available in red and can be used for flush mounting.

Manual call point with resettable plastic element FDM225-RP

Manual call point with glass plate FDM225-RG

Accessories:
Back box FDMH295-R

Back box with holes and grommet FDMH295-S

Protective cover FDMC295

Manual call point FDM226
Resettable and IP66, available in red.

Manual call point with resettable plastic element incl. back box FDM226-RP

Manual call point with glass plate incl. back box FDM226-RG

Accessories:
Protective cover FDMC295

Manual call point FDM224
IP44 or IP64, available in different colors.

Electronic switching unit FDME224

Housing with glass and key:
Housing red FDMH293-R

Housing yellow FDMH293-Y

Housing green FDMH293-G

Housing blue FDMH293-B

Housing orange FDMH293-O

Accessories:
Protection seal DMZ1197-AD

Protective cover DMZ1197-AC

Locking plug M20 (1 hole)

Locking plug M20 (2 holes)

Manual call point FDM224H
Heavy Duty, IP44 or IP64, available in red.

Electronic switching unit FDME224

Housing:
Housing red FDMH292-R

Accessories:
Protection seal DMZ1197-AD

Protective cover DMZ1197-AC

V-Plug

Manual call point FDM223
IP44 or IP64, with indirect alarm actuation, available in different colors.

Electronic switching unit FDME223

Housing with glass and key:
Housing red FDMH293-R

Housing yellow FDMH293-Y

Housing green FDMH293-G

Housing blue FDMH293-B

Housing orange FDMH293-O

Accessories:
Protection seal DMZ1197-AD

Protective cover DMZ1197-AC

Manual call point FDM223H
Heavy Duty, IP44 or IP64, with indirect alarm actuation, available in red.

Electronic switching unit FDME223

Housing:
Housing red FDMH292-R

Accessories:
Protection seal DMZ1197-AD

Protective cover DMZ1197-AC

V-Plug

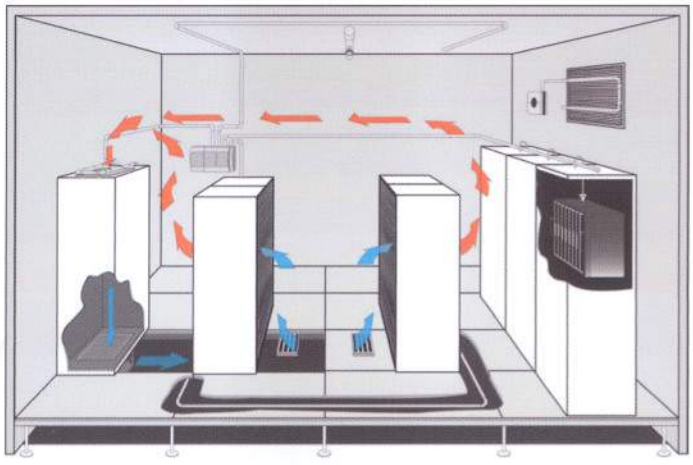
Early Warning Smoke Detector (EWSD)
Active Fire Detector

How Detector Works?

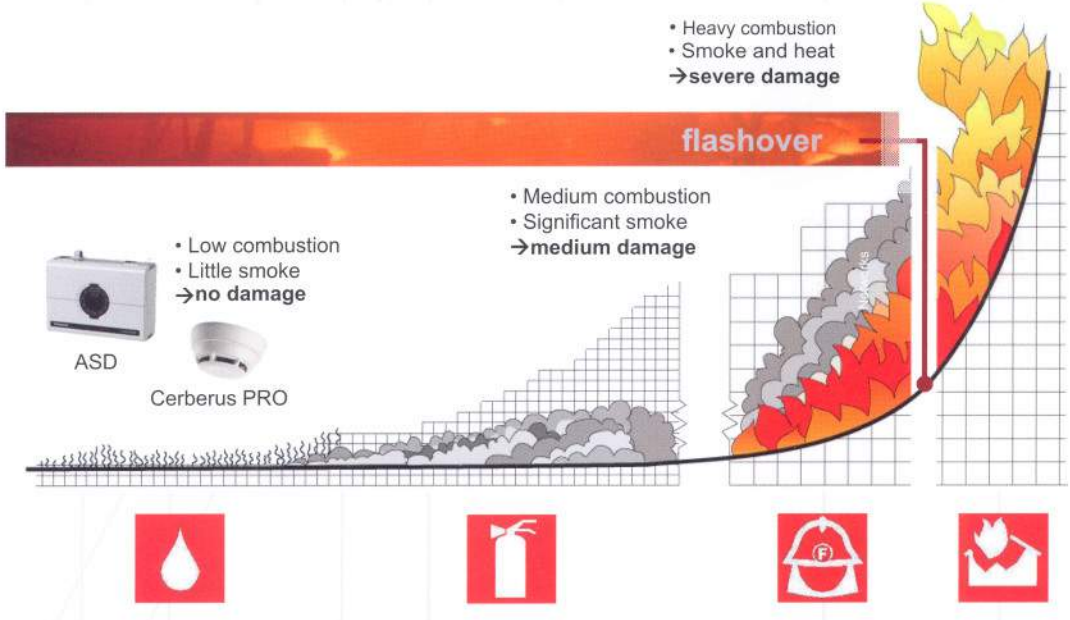
It works by continuously drawing air into a distributed pipe network via a high-efficiency aspirator. The air sample then passes through a dual-stage filter. The first stage removes dust and dirt from the air sample before it enters the laser detection chamber. The second, ultra-fine stage provides an additional clean-air supply to keep the detector's optical surfaces free from contamination, ensuring stable calibration and long detector life as well as minimizing nuisance alarms. From the filter, the air sample goes through the calibrated detection chamber where it is exposed to a laser light source. When smoke is present, light is scattered within the detection chamber and is instantly identified by the highly sensitive receiver system.

Applications:

- When smoke is difficult to detect
- Telecommunication Facilities
- High-Tech Manufacturing
- Industrial Facilities
- Textile Plants
- Server Rooms
- Data Centers



As the below figure shows, early warning smoke detectors, are used to detect fire in the early stages:



Selecting Desired Detector

Feature	Model				
	VLF 250	VLF 500	VLP	VLS	VLI
Area Coverage (Maximum)	250 m2	500 m2	2,000 m2	2,000 m2	2,000 m2
No. of Inlet Pipe	1	1	4	4	4
Multiple Pipe Addressability	No	No	No	Up to 4	No
Maximum No. of Holes	12	24	100	60	48
Pipe Length (Maximum)	1 x 25 m or 2 x 15 m	1 x 50 m or 2 x 30 m	Aggregate: 200 m	Aggregate: 200 m	Aggregate: 360 m

Integrated Fire Safety and Security Solutions

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