



UNIVERSITY OF MARYLAND

Department of Fire Protection Engineering




Detection and Alarm Systems

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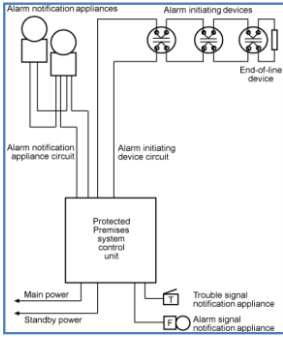
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Detection and Alarm

Fire detection / alarm system

- Initiating circuits
- Control panel
- Indicating circuits
- Power supplies



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Functions of Fire Alarm Systems




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Initiating Devices




- Devices that respond to heat, smoke or other fire signatures, *or* devices which sense movement, flow or other quantities associated with fire and fire protection systems




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Fire Signatures




- Thermal Energy
 - Convection
 - Radiation
 - Ultra-violet: $< 0.4 \mu\text{m}$
 - Visible: $0.4 - 0.7 \mu\text{m}$
 - Infrared: $> 7000 \mu\text{m}$
- Suspension of Matter (aerosol)
 - Invisible
 - Visible
 - Gases




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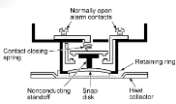
Heat detectors




Spot




Fixed temperature or rate of rise




Linear




PROTECTOWIRE® LINEAR HEAT DETECTOR




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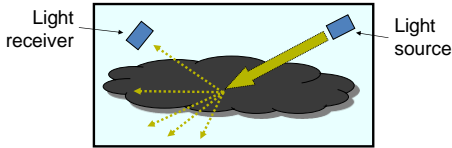


Smoke Detectors




- Photoelectric- light scattering







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Stages of Fire Growth




- Projected Beam- light obscuration






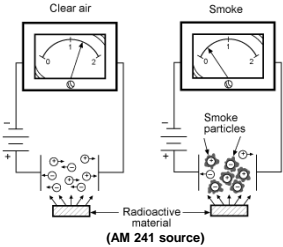
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Smoke Detectors




- Ionization






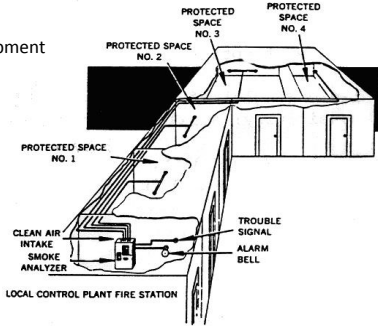
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Air Sampling Detectors




- Applications:
 - Electronic equipment rooms
 - Clean rooms
 - Other?

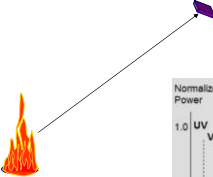


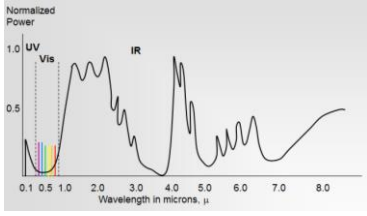
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Radiation Detectors










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Video Detector







Selection of Initiating Device



- Response time
- Prevalence of particular signature(s)
- Ambient environment: nuisance alarm source(s)
- Cost

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Notification Appliances






- Audible
 - bell
 - horn
 - chime
 - variable tone
- Visible
 - Strobes
- Tactile
 - Bed shaker




www.firelite.com



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Summary



- Fire detectors are available to detect a variety of signatures from fires.
- Fire alarm systems are used to alert building occupants and may also perform additional functions

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