

Stratos®

High Sensitivity Aspirating Smoke Detectors

APPLICATION NOTE

Electronic Data Processing Rooms



Introduction

Electronic Data Processing (computer) rooms present unusual problems to the fire engineer. Computers are typically high value, business critical equipment which should demand high performance early-warning smoke detection systems. This equipment is typically located in areas employing 'close control' air-conditioning and recirculation systems, which effectively prevent relatively cool 'smoke' from incipient fires from being able to enter conventional detectors. Conventional 'point' type smoke detectors have two main failings in this application.

1. They are substantially less sensitive than High Sensitivity aspirating Smoke Detection products which must by definition produce a later warning. (Note 1: This warning should also include some types of aspirating systems which contain conventional smoke detectors).
2. Because of the high rate of air movement provided by cooling plant, only when a substantial heat source (fire) is present will smoke have sufficient thermal buoyancy to rise to 'conventional' smoke detector location at the ceiling.

Factors 1 and 2 combine to make point detectors a very poor choice in this application.

Combustion products from fire in an environment containing substantial quantities of synthetic materials such as PVC can be very harmful to delicate electronic equipment, so if fires can be detected sufficiently early, then damage can be minimized or sometimes eliminated altogether. Very early 'incipient' fire detection in this type of environment can also obviate the need for expensive and potentially damaging fire extinguishing gas discharges.

Flexibility

It was recognized many years ago that the relatively cool smoke from electrical fires travelled with the air currents generated by the air handling system, instead of rising to the ceiling where conventional type point smoke detectors were installed. This led to the development of 'Primary Detection', which employs a High Sensitivity aspirating detector taking a continuous air sample from the airflow returning to Air Handling plant (see fig. 2). Aspirating smoke detectors are able to provide reliable detection in this manner, and the rapid air movement works in favor of the detection system, carrying any dilute smoke particles on the airstream, rather than away from the detector. The very high sensitivity of the detector is not hindered in any way by locating it in the rapidly moving air, in fact detection performance will generally be enhanced by the rapid transportation of smoke particles to the detector.

Although 'primary detection' offers a very efficient way of protecting an area which has high air movement, if the air handling system is switched off, protection will be poor. Any smoke will rise to the ceiling in the normal way. Consideration should be given to providing Secondary Protection by applying either normal point detectors or, if high sensitivity is required, additional aspirating detection points positioned on the ceiling and in void spaces.

Eliminating nuisance alarms

Avoiding unwanted alarms is crucial in business critical areas such as EDP rooms, and in particular when applying a system operating at much higher than 'normal' sensitivity. All Stratos-HSSD® detectors incorporate a sophisticated system of Perceptive Artificial Intelligence (PAI) which ensures that maximum safe sensitivity is maintained at all times (see ClassiFire® data sheet). A dual technology approach is taken to avoid false alarms from non-fire generated particles such as dust, using a combination of mechanical particle separators and electronic Laser Dust Discrimination (LDD™).

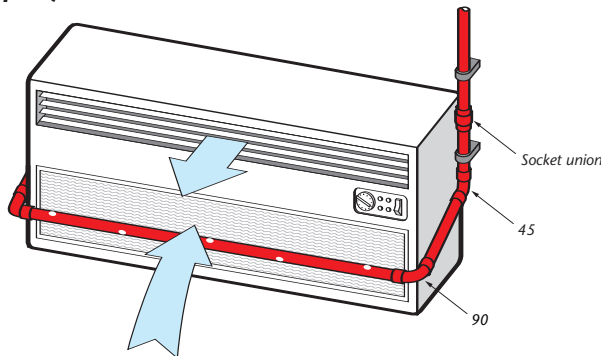
If there is a possibility of external pollution being ingested to the area and generating an unwanted alarm (smoke from nearby burning of rubbish entering the area as fresh air make-up for example) then a Reference Detector may be used to monitor the condition of the fresh air make-up, and the subtraction of this signal, or a proportion of this signal from detectors used to protect the area.

Efficient detection in computer rooms

- Position sampling pipes across the return air grilles.
- Use a separate sampling pipe for each Air Handling Unit.
- Route detector exhaust air back to the sampling location to equalise any air pressure differences.
- Use different detectors for Primary and Secondary Protection unless the room is very small. (less than 5000ft³ (1500m³)).
- Use different detectors to protect each void space unless the room is very small.



Fig. 1 Sampling across a small split system room unit

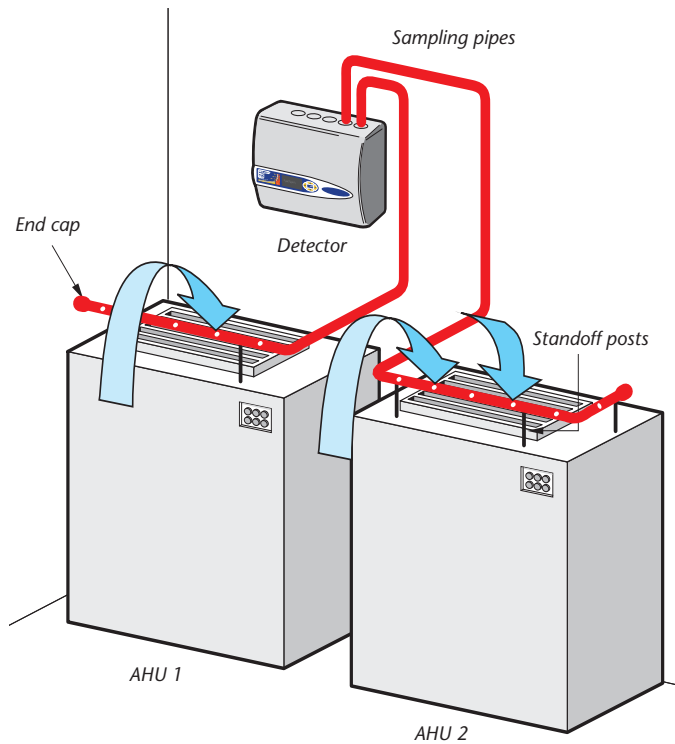


Performance testing

It is important that any air handling systems are operational before any testing commences because of their effect on air movement. Most aspirating systems installed in EDP areas are high sensitivity early warning systems and an appropriate performance test such as those described in the BFPSA Code of Practice for Aspirating Smoke Detection Systems or NFPA 76 should be selected (6ft (2m) wire overload for example).

More detailed information on protecting Electronic Data Processing rooms and other types of risk can be found on our website at: www.airsensetechnology.com/documents/guides

Fig. 2 Sampling from air handling units (AHUs)



Some successful worldwide installations for EDP protection:

Rank Hovis - UK	Reliance National - UK	Sainsbury's - UK	Commerz Bank - Benelux	ABB Info System - Sweden	Dow Jones Markets (M) Sdn. Bhd. - Malaysia
British Airways - UK	ICI - UK	Bass Taverns - UK	ENI - Benelux	University of Örebro - Sweden	KLOFFE Capital - Malaysia
Ecclesiastical Insurance - UK	Siemens Plessey - UK	Clitbank - UK	ING-Bank Main Office - Benelux	Stockholm Stock Exchange - Sweden	MESDAQ Bhd. - Malaysia
T.I Group - UK	Mercia Police HQ - UK	Ove Arup Partnership - UK	Shell Petroleum - Benelux	Ericsson - Sweden	Hwang - DBS. - Malaysia
GEC Marconi - UK	Videotron - UK	South Western Electricity Board - UK	Rhone-Poulenc - France	Rank Xerox - Germany	Sony - Malaysia
Shell Petroleum - UK	Flestiniogg Power Station - UK	Scandinavian Bank - UK	Central Bank of Finland - Finland	German Telecom - Germany	Guinness Anchor Berhad - Malaysia
Newham Borough Council - UK	Royal Insurance - UK	Goodyear Tyres - UK	Finnish Air Force - Finland	GKN - Germany	Ericsson. - Malaysia
South Wales Electricity Board - UK	China Bank - UK	Phillips Petroleum - UK	Stora Enso - Finland	Deutscher Wetterdienst - Germany	Singapore Nokia Nordiac Centre - Singapore
Esso Research - UK	Wang Computers - UK	American Express - UK	Foxtel - Australia	DeTe Immobilien - Germany	Singapore Foxboro - Singapore
British Steel - UK	Texaco - UK	Reuters - UK	National Australia Bank - Australia	Spar - Germany	Sonangol - Angola
Honeywell Computers - UK	Stag Brewing Co. - UK	Credit Suisse - UK	Australian Quarantine Service - Australia	Banco de España - Iberia	Duke Power - USA
Westminster City Council - UK	Merrill Lynch - UK	Carnegie Investment Bank - UK	AMCOR - Australia	Antena 3 TV - Iberia	Pinkerton New York - USA
Harwell Laboratories (UKAEA) - UK	Crown Cork & Seal Co. - UK	Pfizer - UK	Taiwan Post Office HQ - Taiwan	Military HQ - Iberia	Chicago Board of Trade - USA
British Telecom - UK	Independent Insurance - UK	Meteorological Office - UK	Investec Bank - South Africa	Smith Kline Beecham - Iberia	Commerze Bank Budapest - Hungary
Lloyds Bowmaker - UK	Deutsche Morgan Grenfell - UK	Nissan Motor Co. - UK	Statoil-Hamang - Norway	BP - Iberia	Ottomans Bank Istanbul - Turkey
Rhône Poulenc - UK	British Aerospace - UK	3Com - UK	Norsk Hydro - Norway	Editorial Ministério da Educação - Iberia	Winterthur Insurance Kowloon - Hong Kong
Birds Eye Foods - UK	Oxford Fire Service - UK	ABB - Benelux	Volvo Trucks - Sweden	Central Hospital of Iceland - Iceland	Tornado/Stricks - Austria
Deutsche Morgan Grenfell - UK	Unisys - UK	SNS Bank - Benelux	Astra Draco - Sweden	Overseas Union Bank Bhd. - Malaysia	
Rover Group - UK	Lloyds Register of Shipping - UK	ING-Bank Main Office - Benelux	Löddeköping Power Station - Sweden	Sakura Merchant Banker Bhd. - Malaysia	Plus many hundreds more...
Open University - UK	West Burton Power Station - UK	Wang Computers - Benelux	Oskarshamn Power Station - Sweden	RHB Sakura Merchant Bank Bhd. - Malaysia	
Lombard Finance - UK	Bloomberg Citygate - UK	3M Corporation - Benelux	Volvo - Sweden	Mobikom Sdn. Bhd. - Malaysia	

