Protec
Fire and Security Group

Aspirating Detection System

Protec Aspirating Detection System
Atria Design Guide

ADDRESSING SAFETY SYSTEMS WITH INTELLIGENCE

Document Revision Details

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Introduction

This Design Guide has been produced by Protec Fire & Security Group to assist when designing Protec Fire & Smoke Aspirating Detection Systems for Atria applications.

The aim of the Design Guide is to provide a basic design concept to enable the designer to provide a considered, compliant and correctly functioning detection system using Protec Aspirating Systems solutions.

Atria areas are presented in many varying dimensions and heights and with varying airflow parameters and fire loads, therefore each Atria design should be designed specifically for its own layout, operation and risk.

Different Atria may contain different combustible materials and generate differing amounts of fire and smoke particles. Therefore, it is important to select the correct detection technology for the risk.

All aspirating system designers should be fully qualified, competent and conversant with the technical operation and differences of the various aspirating technologies and detectors. Designers should also familiarize themselves with all aspects of local applicable codes and standards.

The following pages offer guidance to the designers and installers of these systems in order to achieve a successful Atria Aspirating Detection System.

Please Note:

The information provided within this Design Guide should be used in conjunction with your Local Standards and Fire Codes. Local regional industry practices where relevant should also be observed.

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Definition of a Protec Aspirating Detection System

Aspirating detectors provide an 'active' detection system that sample air from a given area or fire zone to detect the presence of combustion particles or smoke.

These combustion and/or smoke particles are transported to the detector via an integral aspirator that continuously draws air from a network of supervised sampling pipes, each containing small holes more commonly known as sampling points.

Having identified an increase in airborne combustion/smoke particle levels this information is presented as a number of staged alarms via the detector display and outputs and is often integrated into the main building fire alarm system.

Aspirating **SMOKE** Detection utilising ProPointPlus 'Optical & CO' Aspirating Smoke Detectors

Protec ProPointPlus aspirating smoke detectors utilise 'optical' LED Scatter Chamber Detectors (SCD's) within each of the four detector sampling ports. Each SCD can be individually pre-set to Class A - high sensitivity (3 holes per pipe), Class B - enhanced sensitivity (5 holes per pipe), Class C - normal sensitivity (8 or 12 holes per pipe) and Prison Cell mode settings. The SCD smoke sensor identifies the visible smoke particles generated as material over-heats. All ProPointPlus aspirating smoke detectors are fully compliant with EN54 Part 20.

ProPointPlus Smoke Detection

Maximum area of detection allowed:	2000m^2 or a single zone or fire compartment
Maximum total length of sampling pipe:	Approx. 200m (subject to calculation program)
Maximum number of pipes:	4
Maximum number of sampling holes:	EN54 Class A – 3 holes per pipe EN54 Class B – 5 holes per pipe EN54 Class C – 8 holes per pipe All designs subject to calculation program verification
Sampling pipe I/D:	15mm – 25mm
Supply Voltage:	20 – 29 volts DC
Current consumption:	Fan speed dependant
Dimensions:	W – 380mm, H – 250mm, D – 137mm

Aspirating **FIRE & SMOKE** Detection utilising Cirrus HYBRID Aspirating Fire & Smoke Detectors

Protec Cirrus HYBRID aspirating detectors contain two separate detection elements to detect two different phenomenon associated with fire (fire particles and smoke particles). The Cirrus HYBRID detector includes as its primary sensor, a 'Cloud Chamber' fire detector. This is supplemented by high sensitivity 'Optical' smoke detectors provided within each of the four detector sampling ports.

Fire detection – The Cloud Chamber detector identifies invisible sub-micron particles generated during the combustion process when an over-heat condition occurs. The cloud chamber measurement scale is in particles per cm^3 (PCM^3) and provides the 'Fire' detection element of the Cirrus HYBRID detector.

Smoke detection – Optical smoke sensors identify visible smoke particles generated as material continues to over-heat. The optical measurement scale is percent obscuration per meter (%Obs/m) and provides the 'Smoke' detection element of the Cirrus HYBRID detector.

Combined Fire and Smoke Scale – Cirrus HYBRID detectors indicate these two separate detection element scales (PCM^3 & %Obs/m) individually, however, as its primary display these two scales are combined and integrated on a bespoke scale known as Combined Fire and Smoke (CFS). All Cirrus HYBRID aspirating fire and smoke detectors are fully compliant with EN54 Part 20.

Cirrus HYBRID Fire & Smoke Detection

Maximum area of detection allowed:	$2000m^2$ or a single zone or fire compartment
Maximum total length of sampling pipe:	Approx. 260m (subject to calculation program)
Maximum number of pipes:	4
Maximum number of sampling holes:	EN54 Class A – 36 holes @ 200 CFS EN54 Class B – 44 holes @ 400 CFS EN54 Class C – 44 holes @ 600 CFS All designs subject to calculation program verification
Sampling pipe I/D:	15mm – 25mm
Supply Voltage:	20 – 29 volts DC
Current consumption:	Fan speed dependant
Dimensions:	W – 380mm, H – 250mm, D – 137mm

Important Note:

The above details reflect the general parameters where an EN 54 approved ProPointPlus or Cirrus HYBRID detector is required. All aspirating detection system designs are subject to the local area/country design, installation and performance codes/requirements.

Additionally, ALL system designs must be verified using Protec 'ProFlow' sampling pipe calculation program.

'ProFlow' sampling pipe calculations confirm acceptability of operational parameters such as type of detector, lengths of sampling pipes, quantity and diameter of sampling holes or capillary sampling points.

Protec Aspirating Detector Power Supply Units

9300/EN/18 **9300/EN/24** **9800/EN/38** **9800/EN/65**

The system designers should ensure a suitable and compatible power supply is used for each aspirating detector. Protec Series 9000 3Amp & 8Amp power supplies are a self-contained supply designed to power Protec aspirating detectors and charge the associated batteries simultaneously.

The charger uses power factor correction to ensure a near unity power factor, and switch-mode technology to provide a lightweight and efficient unit.

The designer should ensure the power supply is sized correctly to suit the alarm load, the quiescent load and alarm standby periods. The following table provides quiescent and alarm power consumption figures for Protec ProPointPlus and Cirrus HYBRID aspirating detectors.

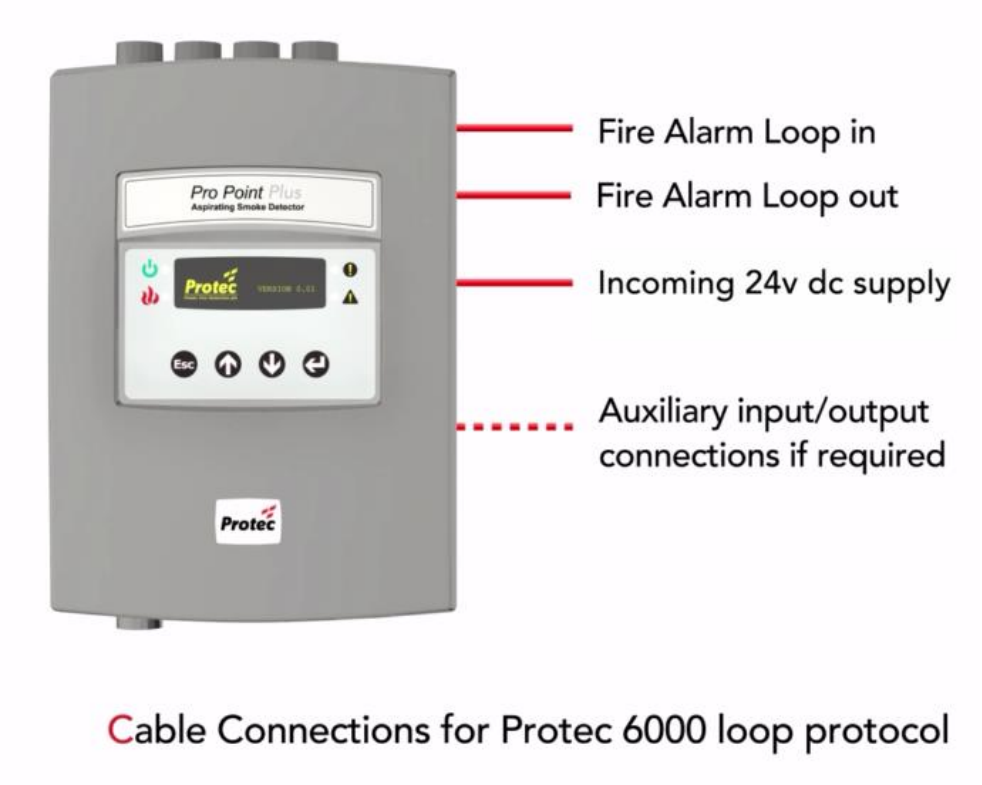
ProPointPlus Detector Power Consumption.

	ProPoint Plus							
Blower Speed (%)	Quiescent				Alarm			
	SCD 1x	*SCD 2x*	*SCD 3x*	*SCD 4x*	*SCD 1x*	*SCD 2x*	*SCD 3x*	*SCD 4x*
100	360	400	425	455	410	450	475	505
95	347	387	411	440	397	437	461	490
90	334	374	397	425	384	424	447	475
85	321	361	383	410	371	411	433	460
80	308	348	369	395	358	398	419	445
75	295	335	355	380	345	385	405	430
70	282	322	341	365	332	372	391	415
65	269	309	327	350	319	359	377	400
60	256	296	313	335	306	346	363	385
55	243	283	299	320	293	333	349	370
50	230	270	285	305	280	320	335	355
45	220	259	274	293	270	309	324	343
40	210	248	263	281	260	298	313	331
35	200	237	252	269	250	287	302	319
30	190	226	241	257	240	276	291	307
25	180	215	230	245	230	265	280	295
20	170	204	219	233	220	254	269	283
15	160	193	208	221	210	243	258	271
10	150	182	197	209	200	232	247	259
5	140	171	186	197	190	221	236	247

Cirrus HYBRID Detector Power Consumption

	CirrusHYBRID							
Blower Speed (%)	Quiescent				Alarm			
	SCD 1x	*SCD 2x*	*SCD 3x*	*SCD 4x*	*SCD 1x*	*SCD 2x*	*SCD 3x*	*SCD 4x*
100	522	590	626	685	622	690	726	785
95	504	572	608	649	604	672	708	749
90	485	558	595	640	585	658	695	740
85	463	545	572	604	563	645	672	704
80	449	531	554	590	549	631	654	690
75	431	495	535	567	531	595	635	667
70	417	481	522	549	517	581	622	649
65	404	467	504	535	504	567	604	635
60	390	454	485	517	490	554	585	617
55	376	440	472	504	476	540	572	604
50	372	417	454	485	472	517	554	585
45	363	408	445	472	463	508	545	572
40	349	395	431	458	449	495	531	558
35	335	381	417	445	435	481	517	545
30	322	367	422	435	422	467	522	535
25	317	363	395	417	417	463	495	517
20	308	354	372	395	408	454	472	495
15	299	345	358	381	399	445	458	481
10	295	335	345	367	395	435	445	467
5	290	317	331	358	390	417	431	458

Typical Electrical Connections for a Protec Aspirating Detector.



Cable Connections for Protec 6000 loop protocol

Fire alarm loop connections

The fire alarm loop connections shown above are for integration into a Protec 6000 protocol main building fire alarm system. Each ProPointPlus detector is manufactured with a 1 – 4 address 6000 protocol interface. This allows up to four address (four pipes), from the ProPointPlus detector, to be individually identified at the Protec 6000 protocol main building fire alarm panel. Cirrus HYBRID non-scanning detectors contain a single address 6000 protocol interface, Cirrus HYBRID scanning detectors contain 1 - 4 address 6000 protocol interface, this allows up to four address (four pipes), from the ProPointPlus detector, to be individually identified at the Protec 6000 protocol main building fire alarm panel.

24vDC Power supply

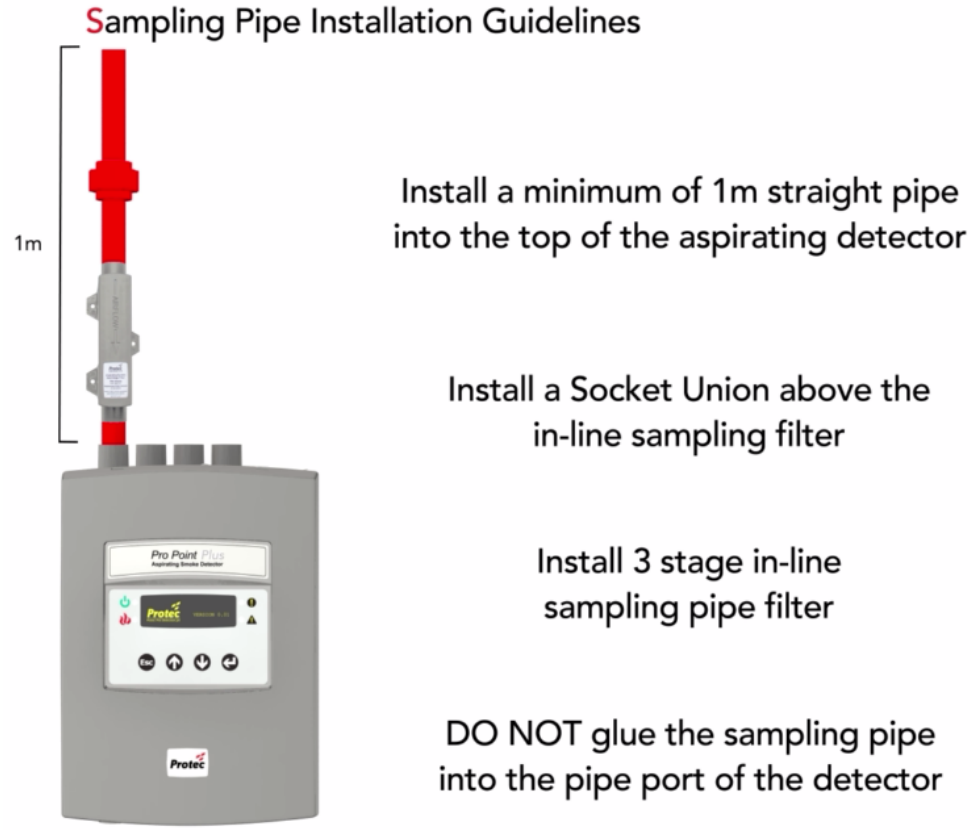
ProPointPlus detectors can be configured to monitor the incoming 24vdc standby power supply and report this directly to a Protec 6000 protocol main building fire alarm panel. Examples of compatible Protec power supply units are given on page 6.

Programmable Input/Outputs

ProPointPlus/Cirrus HYBRID aspirating detectors have 3no. programmable 'Input' connections for remote Isolate, Silence, Reset, Mains Fault and Battery Fault monitoring.

ProPointPlus/Cirrus HYBRID aspirating detectors have 5no. programmable 'Output' connections for common Fault, common Pre-Alarm, common Fire, Pipe 1 Fire, Pipe 2 Fire, Pipe 3 Fire, Pipe 4 Fire and Double Knock signals., usually used to connect to non Protec main building fire alarm panels.

Typical Mechanical Connections for a Protec Aspirating Detector.



Do not glue the sampling pipes directly to the aspirating detector inlet ports

Each sampling pipe port utilises a reducing diameter pipe entry designed for 25mm o/d sampling pipe. The installer should ensure the sampling pipe is cut squarely and pushed firmly into the pipe port until held securely within the port. If the above is installed correctly, there should be no requirement for the sampling pipe to be glued into the sampling pipe port, thereby allowing removal for future servicing requirements.

In-line Filters

All optical only based aspirating detectors can provide unwanted (false) alarms from dust. Protec would therefore recommend an in-line sampling pipe dust filter for all atria applications. The Protec 3 stage in-line dust filter contains a fine particle filter (greater than 5 micron), a medium particle filter (greater than 10 micron) and a course particle filter (greater than 16 micron). The Protec 3 stage in-line filter, should be suitable for most atria applications. (Part code 61-986-F01)

Socket Unions

Protec would recommend the installation of a socket union pipe accessory on each sampling pipe above the in-line sampling pipe filter. This allows removal of the complete filter for cleaning, should this be required during system servicing.

1m straight pipe at entry to aspirating detector

Protec would recommend a 1m straight length of sampling pipe at the point of entry to the aspirating detector to assist with linear airflow being provided to the airflow monitoring components.

Protec Aspirating System Sampling Pipe and Accessories

37-550-68
3 Metre Length 25mm o/d
Red ABS Sampling Pipe

37-550-68-SR
50m Length of 25mm o/d
Flexible Red Sampling Pipe

37-552-70
25mm Red ABS 90°. Long Radius Bend

37-555-73
25mm Red ABS 45 deg. Elbow

37-554-72
25mm Red ABS 'Tee' Piece

37-553-71
25mm Red ABS End Cap

37-559-77
25mm Red ABS Socket Union

37-558-76
Red ABS Pipe Clips

37-551-69
25mm Red ABS Jointing Socket

37-560-70
Conical Head Capillary Sampling point
2mtrs of 10mm sampling tube

37-561-71
Flush Disc Capillary Sampling point
2mtrs of 10mm sampling tube

37-562-72
Discrete Capillary Sampling point
2mtrs of 10mm sampling tube

37-563-73
T piece for use with 10mm Capillary
Sampling tube

37-564-74
30mtr coil RED 10mm Capillary
Sampling Tube

37-564-74W
30mtr coil OPAQUE 10mm Capillary
Sampling Tube

37-566-76
Conical Head Capillary Sampling Point

37-567-77
Flush Disc Capillary Sampling Point

37-568-78
Discrete Capillary Sampling Point

37-585-15
25mm Red ABS End Cap 'Test Point'

37-586-16
Flush Disc Capillary 'Test Point' c/w 2mtrs of 10mm sampling tube.

37-545-71
1m x 25mm o/d Flexible Expansion Loop

37-556-74
S250ml Tin Solvent Cement

23-039-37
Sample Hole Warning Labels. Roll of 100
1no Label required per Sampling Point

37-534-68 - 2.0mm Purple
37-535-69 - 2.5mm Grey
37-536-70 - 3.0mm Yellow
37-537-71 - 3.5mm Blue
37-538-72 - 4.0mm Green
37-539-73 - 4.5mm Black
37-540-74 - 5.0mm W hite
37-541-75 - 6.0mm Brown

Hole Identification Tags
(See Datasheet - MED2123)

61-986-F01 - 25mm In-line Pipe Filter
61-986-28 - 3 Stage Replacement Filter Mesh (See Datasheet - MED2125)

45-023-04
Heavy Duty Dust & Humidity Filter
(See Datasheet - MED2124)

45-023-07 - Heavy Duty Dust & Humidity Filter c/w Self Drain Flexible Loop
(See Datasheet - MED2124)

37-584-14-BIS
Condensation Trap

37-599-29
Flush Disc Capillary Test Point

37-590-20
Pipe Cutter

Detector Sensitivity Settings often referred to as 'Detector Class'

The sensitivity setting of the aspirating detector is primarily determined by the Atria height and any natural or forced ventilation.

Local country design codes should be referenced for clarification on this. For UK projects generally a 'Class C' detection system is acceptable for atria up to 10.5m high, for atria above this height a 'Class B' detection system would be required. In atria applications where the roof is particularly high (above 25m), a 'Class A' detection should be considered.

Class A Detection System

Definition:- Aspirating smoke detector providing very high sensitivity. These systems are often employed in areas so that evasive measures can be initiated before any significant damage is incurred to areas containing mission critical or high value artefacts or operations.

Class B Detection System

Definition:- Aspirating smoke detector providing enhanced sensitivity. These systems are often employed in areas where fire and smoke particles are difficult to detect. This would include areas where there is dilution from high airflow movements or where there are high ceiling spaces.

Class C Detection System

Definition:- Aspirating smoke detector providing normal sensitivity. These systems are often employed as an alternative to point type smoke detectors or beam detectors for reasons such as building deflection or where perhaps servicing is made easier using aspirating system pipe installations.

Note:

Where the atria 'background particle levels' will not allow the aspirating detector to be set to one of the above categories, it is important to introduce an extended 'soak test period', where the background pollutant variations can be determined. Having logged this information for an appropriate time period, the alarm thresholds can then be configured to avoid unwanted alarms.

Having established the ambient background environment and detector alarm thresholds, a suitable 'performance test' is recommended. Any tests should be agreed by all concerned parties and appropriate health and safety procedures should be adhered to. See Note below on 'Requirement for Aspirating Detection System Performance Testing.'

Protec Aspirating Detector Choice for Atria Applications

Protec ProPointPlus and Cirrus HYBRID aspirating detectors are both suitable aspirating detectors for atria applications, however the following points should be noted.

Where stratification can be expected in the atria application, a preference would to be utilise a Cirrus HYBRID detector as the cloud chamber technology within these aspirating detectors has been shown to be more resilient to the effects of stratification than optical only aspirating detectors. This is due to the quantity and buoyancy of the fire particles detected by this technology.

The smoke from an overheat condition can be diluted where natural or forced air ventilation is present within the atria. The cloud chamber technology within Cirrus HYBRID aspirating detectors has been shown to be more resilient to the effects of dilution than optical only aspirating detection systems.

General Design Guidelines for Atria Applications

Note:
The FIA Code of Practice for Design, Installation, Commissioning and Maintenance of Aspirating Smoke Detector (ASD) Systems Issue 3 February 2012 and British Standard BS5839-1:2013 now permit that aspirating detection systems can be installed up to 40m high, subject to the correct detector sensitivity and number of sampling holes being utilised for the protected area. Please refer to your Local Standards and Approvals where required.

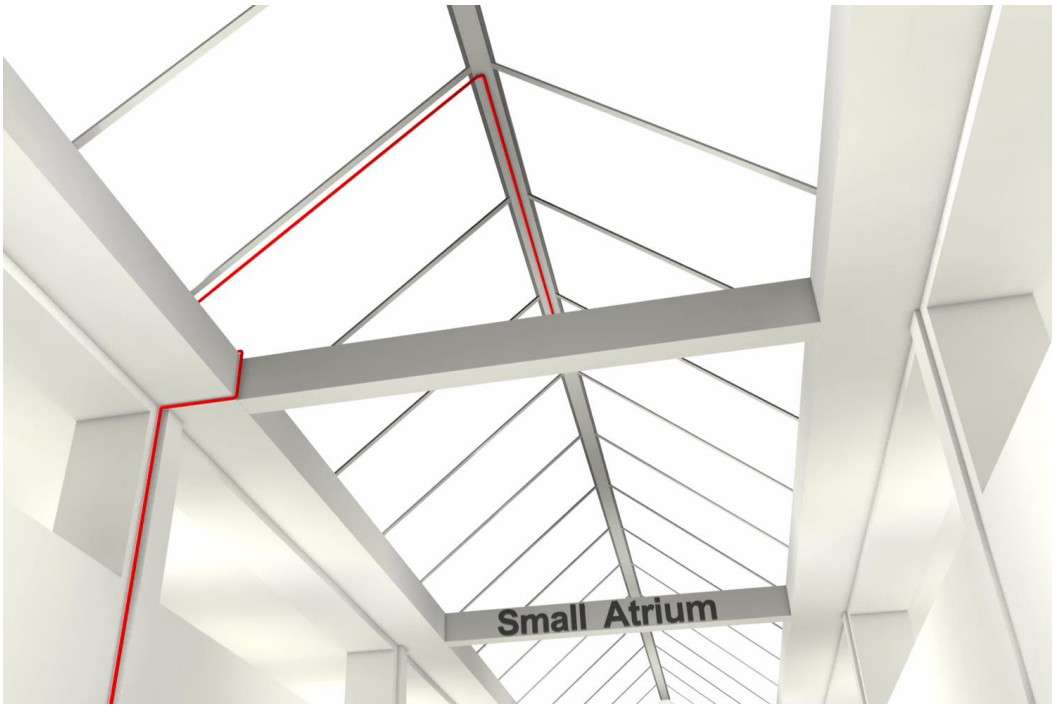
There are numerous items that can affect the design of an aspirating detection system within an atria. These include but are not limited to the height, width, length, wall and ceiling structures, wall and ceiling surface finishes, fire loads, general use, day/night operating conditions, natural and forced air ventilation and expected performance of the installed aspirating detection system.

With all these variables in mind, it is essential the designer has access to as much of this information as possible in order to prepare the aspirating detection system design to be fit for the operational purposes of the atria.

Having established as much relevant information as possible, the following provides some basic design guidance for atria applications.

Locating the aspirating detector

The designer should ensure the aspirating detector is installed in a suitable location and to provide easy and safe access for future service engineer visits. Ideally, this location should try, where possible, to keep to a minimum the overall sampling pipe lengths.



Confirmation of any natural and/or forced air ventilation systems

Where an atria does not contain any forced or natural air ventilation the aspirating detection system design should provide suitable 'area of coverage' detection, as per the guidance of the local country design codes. This is often referred to as a Secondary Detection System. Specific 'area of coverage' design code reference should be confirmed when very high atria are to be protected.

Where an atria does contain forced or natural air ventilation, the aspirating system design should provide suitable 'area of coverage' detection as per the guidance of the local country design codes (Secondary Detection as described above) AND additional sampling points or even additional aspirating detectors, dedicated to extract locations of the forced or natural air ventilation. This is often referred to as both a Primary Detection System and a Secondary Detection System.

For Primary Detection Systems, normal practice would be to install the sampling points across the extract air positions from the atria. Consideration should be given to the operation of these extract air arrangements, as the extraction system may not be operational at all times. When the air extraction is non-operational the Primary Detection System is effectively rendered immaterial; at this time the Secondary Detection System becomes more prevalent. The Designer should ensure suitable detection is provided for all eventualities of the atria airflow conditions.

Stratification Effect on Aspirating System Designs in Atria.

Stratification can occur when air containing smoke particles or gaseous combustion products is heated by smouldering or burning material. Whilst becoming less dense than the surrounding cooler air, it rises until it reaches a level at which there is no longer a difference in temperature between it and the surrounding air. The smoke plume, as it rises, encounters colder air from above which absorbs heat and slows the upward movement of the smoke.

As this stratified gas layer moves away from the fire, cooling and dilution will eventually produce a well-mixed flow of combustion products.

Stratification can also occur during hot days when the sun may have heated the atria structure of a building to a high temperature producing a much hotter air layer just below the roof. A small fire starting at ground level may not have the thermal energy to push the smoke particles through the higher temperature air barrier. This would result in the smoke not reaching the detection points on the roof level until the fire is considerably larger. In addition to the above general advice, the designer's attention is drawn to atria where glazed ceilings are installed, as these may be particular prone to stratification on hot days.

One option when stratification is considered to be relevant would be to allow one or more vertical sampling pipes, with sampling holes at different vertical spacings, to be dropped from the highest level to a height where they would not be affected by the stratification. These are known as vertical sampling points and would be in addition to the main ceiling detection sampling points.

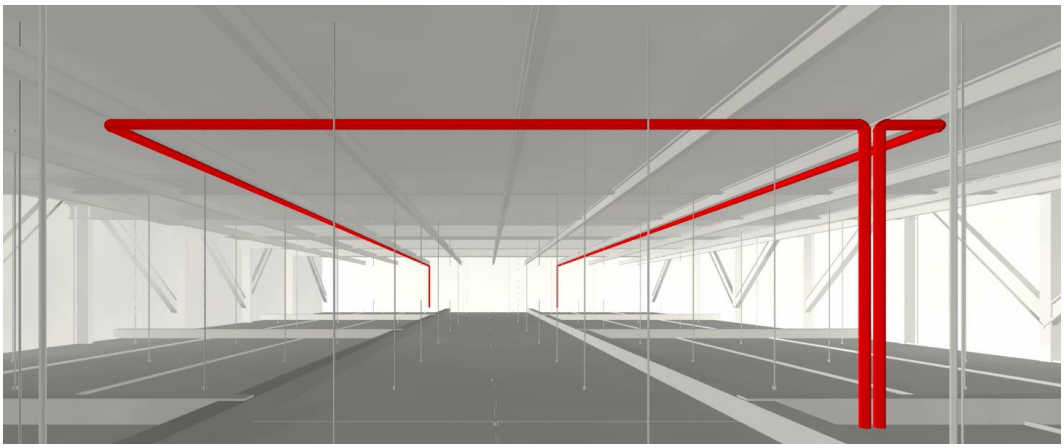
Maintenance Test Points

Low level sampling pipe 'Maintenance Test Point'

Where the sampling pipe arrays would normally finish on an inaccessible high level ceiling area or extract point, it is recommended that low level Maintenance Test Points be installed. These test points must be configured after the last sampling hole and to a location where future servicing can be carried out.

Atria Areas Containing Ceiling Voids

Where the atria is constructed with a suspended ceiling void, the designer should still consider any requirements for both Primary and Secondary Detection Systems, as these could also be relevant within the void area due to forced or natural ventilation systems.



Separate ceiling void detection above an atria area

If the void above the atria is required to be identified separately from the main atria area, a dedicated sampling pipe configuration should be installed. These pipes would need to be coupled to either a scanner type aspirating detector, where the detector can individually identify each sampling pipe or alternatively, one or more dedicated aspirating detectors.

Combined ceiling void detection above an atria area using extended or capillary sampling points

If the void above the atria can be identified as part of the main atria area a combined sampling pipe configuration can be considered. These pipes would provide detection to the ceiling void area itself and the atria area below and are identified as a common area by the aspirating detector. Extended sampling points, where extensions of the main pipes (typically 25mm o/d), are taken from the void to the atria ceiling below or 'capillary sampling pipes, which use a smaller bore flexible sampling pipe, may be used to facilitate this.

Pressure Differentials between the Aspirating Detector and the Sampling Point Area

Pressure differentials can be created within the aspirating 'system', if the aspirating detector is located in a different area (pressure zone), than that of the protected space.

It is likely to be a requirement for many atria applications that the aspirating detector exhaust pipe be returned to, and be terminated within, the actual space of the sampling detection. This should allow any pressure differentials between the atria compartment and the location of the aspirating detector to be equalised.
Please refer to the Generic Design and Installation Guide for further guidance.

Dilution Effect on Aspirating System Designs

Dilution can affect aspirating detection systems and therfore this should be considered at design stage. The amount of dilution is affected by the detector sensitivity and the number of sampling holes within the protected area. When combustion/smoke particles are only drawn through a single sampling hole, these particles are diluted when they reach the detector by the clean air drawn through the remaining holes. Given that this is the case, the more sampling holes used on the design the greater the potential for dillution.

Aspirating systems should be designed (and proven by a sampling pipe calculation program) to ensure a similar amount of airflow is drawn through each sampling hole. Additionally, verification testing of detector response and transport time is required for each sampling hole.

Where Protec EN54 part 20 approved aspirating detectors are used the restrictions on the number of sampling holes has been determined as an integral part of the approval process. See detector specifications.

Venturi Effect around Sampling Holes

The aspirating system designer should consider any natural or forced air movement likely to be prevalent around the areas where the sampling holes are located. One effect of excessive natural or forced air movement could be to create areas where a Venturi Effect would reduce or possibly prevent, air entering the sampling points thus restricting the efficiency of one or more sampling holes.

Design Verification

It is a requirement that upon completion of every aspirating system design confirmation of all the design parameters is verified by the use of a compatible sampling pipe design calculation programme.

This programme should confirm the following:

- The model number, type and fan speed of the selected detector
- The relevant approvals of the selected detector
- The minimum and maximum pipe lengths and number of sampling holes proposed
- The airflow rates, parameters and pressures at each part of the installation
- The time taken from all the sampling holes to the detector (transport time).

This programme will confirm the sampling hole dimensions and will indicate if there are any errors with the overall design.

Requirement for 'Commissioning/Function Testing'

Any commissioning or functionality testing required by any design code or local country legislation, should be carried out when the installation works are fully electrically and mechanically complete. Testing should include the individual testing/proving of ALL sampling holes of the aspirating detection system, using only the correct test material and in conjunction with the relevant Protec product manuals. The results of these tests should be recorded on the appropriate commissioning documentation.

The designer should therefore confirm at design stage the possible requirements of any functionality testing with regards to any cause and effects of the installed aspirating detection system, should this be required.

Requirement for 'Performance Testing'

Any performance testing required by any design code or local country legislation, should only be carried out when the Atria is in its final environmental and operational state, with any air conditioning, pressurisation systems or ventilation systems etc. active.

The designer should therefore confirm at design stage the most suitable 'performance test' for the installed aspirating detection system, should this be required.

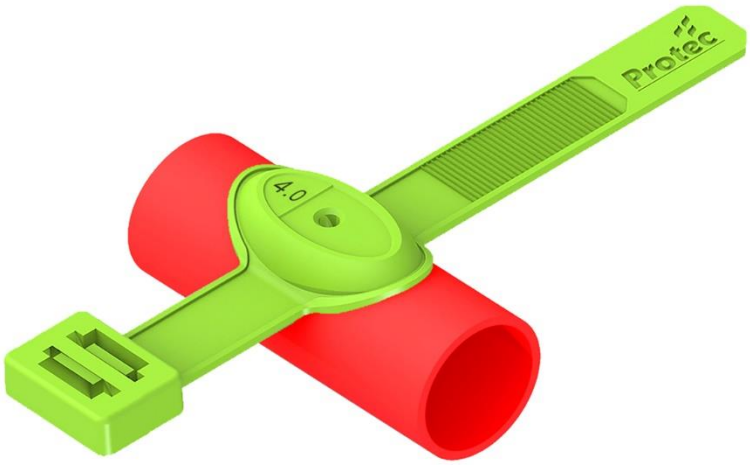
‘HIT’s’ Hole Identification Tags.

Where possible and practical, Protec would recommend the installation of ‘Hole Identification Tags’ (HIT’s) for Atria applications.

Each HIT is colour coded to identify its specific sampling hole diameter. This colour coding allows accurate identification of the various sampling hole locations and true hole size for the benefit of commissioning & servicing engineers, clients and even project auditors.

A build-up of dust around a standard drilled sampling hole is common place in atria applications, due to the friction created by the airflow through the sampling hole. Each HIT incorporates a chamfered hole entry which is proven to significantly reduce this dust loading effect.

To assist the installers a common, 8mm diameter drill is all that is required for every sampling hole location.



HIT Product Codes:

Product Code	Description
37-534-68	2.0mm - Purple HIT
37-535-69	2.5mm - Grey HIT
37-536-70	3.0mm - Yellow HIT
37-537-71	3.5mm - Blue HIT
37-538-72	4.0mm - Green HIT
37-539-73	4.5mm - Black HIT
37-540-74	5.0mm - White HIT
37-541-75	6.0mm - Brown HIT

As previously detailed **all** system designs must be verified using Protec ‘ProFlow’ sampling pipe calculation program.

Atria Design Checklist

- Confirm and implement Local Country Design Standards and Fire Codes
- Confirm aspirating detection system detector, sensitivity and performance requirements
- Confirm full dimensions of the area protected by the aspirating detection system
- Confirm Aspirating standby requirement period for correct power supply unit
- Ensure all aspirating detectors are designed to be installed in a safe, clean, ambient temperature area (+5^{0}C. to +25^{0}C)
- Confirm and implement the aspirating design with regards to the dimensions of the atria and any natural or forced air ventilation/extract systems (primary/secondary detection systems)
- Confirm all sampling pipe designs are verified by the appropriate sampling pipe design calculation program and to provide sampling hole dimensions
- Ensure the design allows for the aspirating detector exhaust to be returned to the same space where the detection originates
- Ensure consideration is given to the sampling hole orientation to prevent Venturi Effect issues from any natural or forced air ventilation/extract systems
- Ensure any required Maintenance Test points are installed within a local serviceable area
- Ensure the design information instructs that each sampling point is individually tested for correct operation and tested fully with regards to Local Country Fire Codes

References

1. British Standards BS5839-1:2017
2. FIA Code of Practice Issue 3 February 2012
3. FIA Fact file 0045 Smoke Detection for High Ceilings 2011
4. Protec Generic Design & Installation Guide
5. Protec Design Guides & Disclosures (located on www.protec.co.uk)

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Aspirating Detection System

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