



## **FAAST LT Consultant's Specification Guide**

## **FAAST LT**

### **High Sensitivity Aspirating Smoke Detection Systems**

#### **Scope of Work**

Under this section the contractor shall supply, install and commission a very high sensitivity Aspirating Smoke Detector (ASD) system in the designated areas identified in the tender document, the ASD will provide detector sensitivity class selection of A, B, or C as set out in EN54-20 and the FIA Design, Commissioning & Maintenance of Aspirating Smoke Detector (ASD) Systems C.O.P Feb 2012 and or local C.O.P for fire detection and alarm systems.

The ASD shall incorporate optical laser point detection technologies comprising laser light scattering principles and inbuilt algorithms to provide immunity to false alarms.

The ASD shall have the capacity to cover an area of 2000m<sup>2</sup> in class C application.

The ASD shall encompass the options of single or dual channel capabilities as follows

1 CHANNEL with 1 SENSOR	(2 pipes per channel)
1 CHANNEL with 2 SENSORS (common chamber)	(2 pipes per channel)
2 CHANNEL with 2 SENSORS (seperate chamber)	(2 pipes per channel)

In the 1 Channel with 2 sensors (common chamber) version, this ASD will provide the configurable options of raising alarm when only 1 or both sensors reach alarm conditions.

In two channel (separate chamber) version, the channels shall be separate and independent of each other, they shall have independent inlets, filters, aspirating fans, ultrasonic sensors, smoke detectors, sounder circuits and exhausted air outlet.

The ASD shall incorporate an integral 24vdc sounder circuit, 1 per channel for remote alarm application.

The ASD shall have sealing ingress rating of IP65, in addition to the IP65 sealing, to provide further ingress protection the ASD electronics will be mounted in a separate internal chamber that does not require access during installation and commissioning or routine maintenance of the ASD system.

The sampling pipe network design shall be by the manufacturer or the manufacturer's approved and trained ESD and shall be produced via the ASD manufactures EN54-20 single software design, configure, monitoring tool. (e.g. Pipe IQ LT)

The EN54-20 single software design , configure, monitoring tool shall have Multilanguage selection inclusive of: English, Italian, Spanish, German, French, Dutch, Portuguese, Russian, Swedish, Norwegian, Finish, Hungarian.

The EN54-20 single software design, configure, monitoring tool shall produce 3D sampling pipe network designs.

The EN54-20 single software design, configure, monitoring tool shall allow for ASD configuration, sampling pipe network design and ASD monitoring.

The EN54-20 single software design, configure, monitoring tool shall generate the 7 required design documents that verify the design compliancy with EN54-20 and the local Code of Practice for ASD system application inclusive of : System design Class, Transport time, Hole sensitivity, Sample air flow rate, Sample point location, Sample air pressure and sample pipe network configuration.

A single ASD shall not cover more than 2000m<sup>2</sup> or more than 1 fire zone.

The ASD shall be secured via the manufactures mounting bracket.

The installation of the ASD system shall comply with EN54-20 approved equipment inclusive of pipe and pipe fittings and accessories along with the FIA Design, Commissioning & Maintenance of Aspirating Smoke Detector (ASD) Systems C.O.P Feb 2012 and or local C.O.P for fire detection and alarm systems.

The following parts of the ASD system shall be clearly labeled;

- Sample pipe
- Sample points
- ASD Unit
- Power Supplies and Battery enclosures.

The labelling shall clearly identify the purpose and where appropriate the zone location of the equipment.

Where access is restricted i.e.: lift shaft, atrium a test point shall be installed in an accessible location to facilitate testing without having to gain access to the protected area.

The commissioning of the installed ASD system must comply with and include performance testing as defined in the FIA Design, Commissioning & Maintenance of Aspirating Smoke Detector (ASD) Systems C.O.P Feb 2012 and or local C.O.P for fire detection and alarm systems.

## **Specification ASD Design Description and Requirements**

The ASD shall incorporate optical laser point detection technologies comprising laser light scattering principles combined with built in advance algorithms to provide immunity to false alarms.

The ASD shall provide 9 selectable sensitivity range settings that will detect smoke particles between 0.06%/m – 6.0%/m.

The ASD shall incorporate inbuilt day and night selection options.

The ASD shall incorporate the programming option of up to 20 holiday days per annum that can be selected to operate the ASD in the night time settings only.

The ASD shall incorporate an integral separate replaceable inbuilt filter that has a 4 year life span as a second filtration process to provide immunity to false alarms.

The ASD shall incorporate dual air flow detection consisting of ultrasonic and electronic detection technology monitoring air flow through the pipe network and the detection chamber.

The ASD shall incorporate an independent 10 segment air flow pendulum graph indicating low or high air flow alarms at 20% segment intervals as required by EN54-20.

The ASD shall have an integral programmable 10 speed aspirating fan with automatic or manual options.

The ASD shall incorporate 2 alarm levels and 10 pre-alarm levels via a 10 segment bar graph, the 2 alarm levels shall provide the following: Pre-Alarm, Fire.

The ASD shall have integral 3 x form C 2amp programmable relays with latching options that shall provide the following alarm signals for external equipment: Fire, Pre-Alarm, Fault.

The ASD shall have an integral built in event log with the capacity to store up to 2,244 events.

The ASD shall incorporate integral facility to create and monitor live or historical trend graphs.

The ASD shall have an integral USB interface port that facilitates for the download / uploading of the system configuration, pipe network design and monitoring of the ASD via a standard USB cable for type B USB connections.

The ASD shall incorporate password access levels as defined in EN54-20.

The EN54-20 software design, configure, monitoring tool shall have the capacity to import drawings in dxf format.

## **Design and Application Codes of Practice**

The fire detection system shall be designed, installed and commissioned in accordance with, and all elements shall meet the requirements of:

- FIA Design, Commissioning & Maintenance of Aspirating Smoke Detector (ASD) Systems C.O.P Feb 2012.
- FIA Design, Commissioning & Maintenance of Aspirating Smoke Detector (ASD) Systems C.O.P Feb 2012.
- FIA C.O.P Cold store and freezer application and design.
- FIA C.O.P Clean room application design.
- FIA C.O.P Heritage building application and design.
- FIA C.O.P In- Cabinet detection application and design.
- FIA C.O.P Dusty environment areas application and design.
- FIA C.O.P Primary sampling for AHU return grills application and design.
- BS 5839-1: (2002) + A2:2008 C.O.P Fire detection and fire alarms for buildings.
- BS 6266 (2011) C.O.P for fire protection for electronic equipment installations.
- EN54-20: 2006 Fire detection and fire alarm systems-Part 20 Aspirating smoke detectors.
- CEA 4022 12/1999 Specifications for fire detection and alarm systems-requirements and test methods for aspirating smoke detectors.
- Regulatory Reform (Fire Safety) Order 2006.
- VdS 2095: 2010-05 VdS-Richtlinien für automatische Brandmeldeanlagen – Planung und Eubau
- ADPAD R7 (Jul06) Règle d'installation. Détection automatique d'incendie
- EN 54-2:1997 / A1: 2006 Fire detection and fire alarm systems - Part 2. Control and indicating equipment
- EN 54-4:2001/ A2: 2006 Fire detection and fire alarm systems - Part 4. Power supply equipment
- EN 54-7:2001/ A2: 2006 Fire detection and fire alarm systems - Part 7. Smoke detectors – Point detectors using scattered light, transmitted light or ionization
- PrEN 54-27 Fire detection and fire alarm systems - Part 27. Duct smoke detectors (Draft)
- The FIA CoP DSD The FIA Code of Practice for Design, Installation, Commissioning & Maintenance of Duct Smoke Detector (DSD) Systems

## Electrical, Mechanical and Environmental Specifications

### Electrical Characteristics

Smoke Sensor (s)	Optical laser point type
External Supply Voltage	18.5-31.5 V
Remote Reset Time	1s
Power Reset	0.5s
Avg. Operating Current	200mA @ 24 VDC (excluding sounders)
Max. Average Operating Current	500mA @ 24 VDC (excluding sounders)
Relay Contact Ratings	2.0 A @ 30 VDC, 0.5 A @ 30 VAC

### Environmental Ratings

Temperature:	-10°C to 55°C
Relative Humidity:	10% to 93% (non-condensing)
IP Rating:	65

### Mechanical

Exterior Dimensions:	H 367mm x W356mm x D135mm
Wiring:	0.5 mm <sup>2</sup> to 2 mm <sup>2</sup> max
Maximum Single Pipe Length	100m (Classes A, B & C)
Maximum Number of Holes	18 (10 x 2.5mm, 8 x 3mm + 3mm end hole - Class C)

## Specification ASD Design Approvals

CE (Construction Product Directive) to EN 54-20 for class A, B and C

LPCB (Loss Prevention Certification Board)

VdS (Verband der Sachversicherer e. V) Germany. Applied for

## Submittals

Site drawings defining areas covered by the aspirating including the pipe network layout device location and wiring schematic.

The ASD system design shall be produced and submitted via the ASD manufactures EN54-20 software design, configure, monitoring tool with documentation verifying the design calculations conformity parameters inclusive of System design Class, Transport time, Hole sensitivity, Sample air flow rate, Sample point location, Sample air pressure and Pipe network configuration.

Submit the manufacturer's product data inclusive of installation and testing instructions and procedures.

Submit manufacturer's operation and maintenance instruction manuals inclusive of installation, commissioning and maintenance procedures.

Submit manufacturer's equipment warranty.



## **Terms Definitions and Abbreviations**

**F I A** UK Fire Industry Association

**ASD** Aspirating Smoke Detector

A unit consisting of one or more smokes sensing elements, an aspirator, one or more flow sensors and necessary controls/electronics, typically housed in a single enclosure, forming the main part of an ASD system but excluding the sampling device.

**ASD system** Aspirating Smoke Detector System

A smoke detection system in which air and aerosols are drawn through a sampling device and carried to one or more smoke sensing elements by an integral aspirator (e.g. fan or pump)

**CIE** Control and Indicating Equipment

Equipment in accordance with EN 54-2 A1: 2006 Fire detection and fire alarm systems - Part 2. Control and indicating equipment

**C.O.P** Codes of Practice

Code of Practice for Design, Installation, Commissioning & Maintenance of Aspirating Smoke Detector (ASD) Systems

**ESD** Engineering System Designers

The manufacturers approved and trained design house.

**EPD** Electronic Data Processing

Machinery and equipment necessary to receive or transmit data, to process it and either to record or print the output results or to feed the output directly to controlled processes.

**EN54-20:**

Equipment in accordance with EN54-20: 2006 Fire detection and fire alarm systems-Part 20 Aspirating smoke detectors

**EN 54-4:**

Equipment in accordance with EN 54-4:2001/ A2: 2006 Fire detection and fire alarm systems - Part 4. Power supply equipment

**Ethernet**

A collection of wired local area network technologies

**FAAST**

Fire Alarm Aspiration Sensing Technology

**Maintenance Test Point**

A test point, provided beyond the last sampling point, to test the integrity of the pipe work. Such a test point is closed in normal operation and is not subject to the maximum transport time.

**Pipe IQ**

EN54-20 approved 3D design, programming and monitoring electronic software design tool for FAAST

**Sampling Pipe**

A length of pipe which, together with sampling holes makes up the most common form of sampling device.

**Sampling Point**

Any point at which an air sample is drawn into the sampling device

**TCP/IP**

Transport Control Protocol / Internet Protocol - A common suite of addressing and routing protocols used on the Internet

Transport Time

The time for aerosols to transfer from a sampling point to the smoke sensing element.

USB

Universal Serial Bus