VESDA | The History of VESDA ASD

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Agenda

CONTENTS

- Introduction to Xtralis
- Introduction to Aspirating Smoke Detection (ASD) and Main Applications
- **Product Overview (VESDA and VESDA-E)**
- System Design and Practical Exercise (Concept, Layout AutoCAD, ASPIRE Software)
- Installation Details
- Commissioning, Testing and Maintenance (Live Demo with VSC Software)
- Test for Certification

Module Objectives

VESDA and VESDA-E Product Overview

Things you will learn:

- Quick history about product (3 main generations)
- Main features for each product
- Compatibility and networking between VESDA and VESDA-E generations
- Available accessories
- Where to find useful documents for more info (data sheets, product guides, main Xtralis catalogue, …)

The History of VESDA ASD

MK2 (1982)

MK3 – E700 (1987)

MK4 E70-D (1992)

Xtralis VESDA VLP (1997)

Xtralis VESDA VLF (2004)

Xtralis VESDA VFT (2009)

Xtralis VESDA VLI (2010)

VESDA-E

VESDA Solution for All Segments

Telco

- Data Centers
- Clean Rooms
- Rail & Metro
- Warehouses
- Cold Storage
- Large Open Spaces

- Shopping Malls
- Small Data Centers
- Switching Rooms
- Stadiums
- Critical Infrastructure
- Command and Control

- Prison Cells
- Electrical Cabinets
- Server Racks
- Heritage Buildings

- Industrial Buildings
- Manufacturing
- Harsh Environment

- Battery Rooms
- Zone 2 Areas

Compact Areas

Worldwide Certifications

- Certified by more than 35 regulators worldwide
- ISO 9001-2000 certified manufacturing
- Six Sigma quality systems

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VESDA 2nd Generation

VESDA L Series

Product Overview

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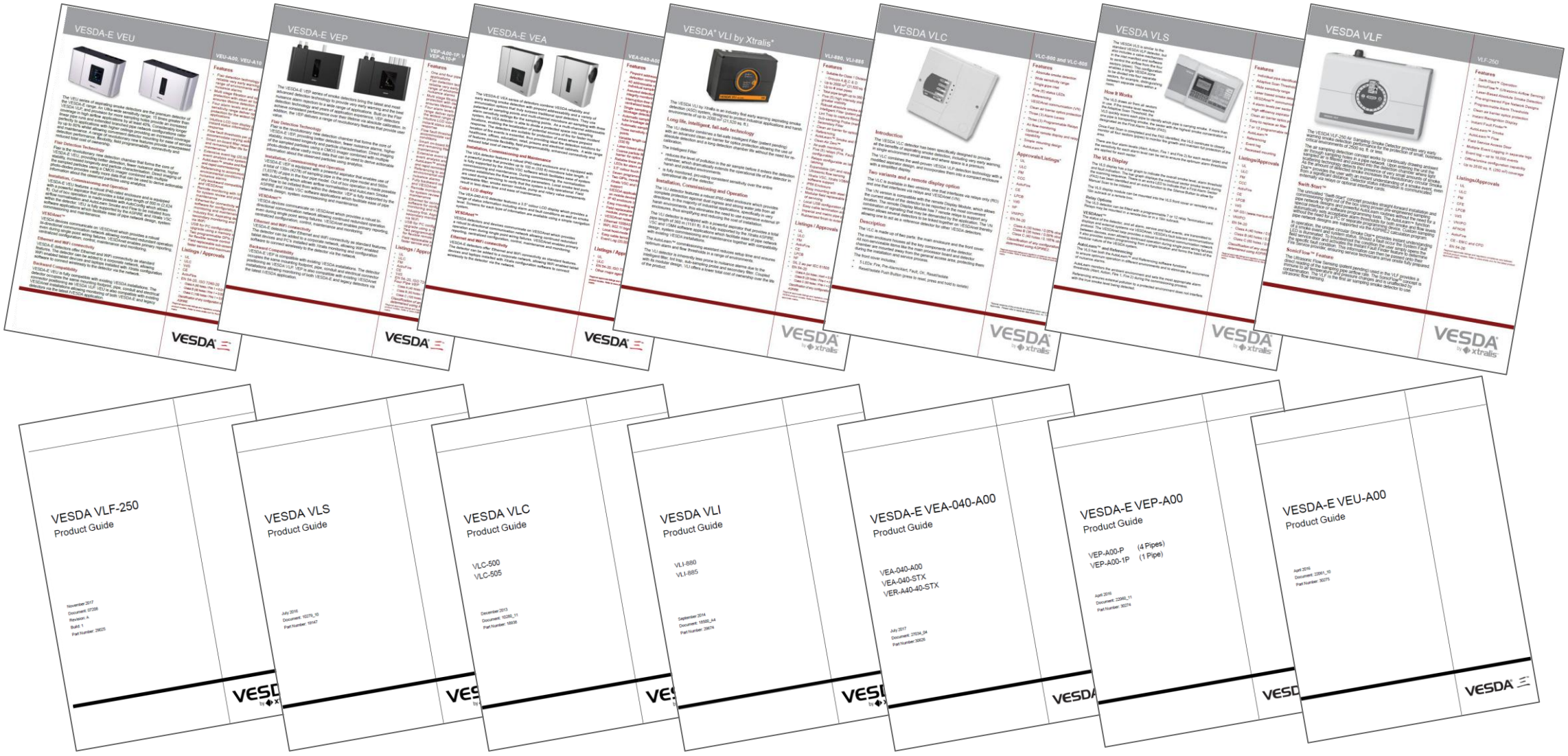
Data Sheets and Product Guides Information



VESDA 2nd Generation EOL

VESDA VLP

VESDA VLS

VESDA VLC

- First model of laser technology is VLP (VESDA LASER PLUS) which has 4 pipe inlets with 4 flow sensors – single zone with single laser chamber.
- VLS (VESDA LASER SCANNER) which is same as VLP except each pipe inlet is individual pipe addressability.
- Both detectors are Up to 2000 m^2 (21520 ft^2) coverage area (Follow Region Codes).
- VLC (VESDA LASER COMPACT) is single pipe inlet and its Up to 800 m^2 (8000 ft^2) coverage area (Follow Region Codes).
- VLP, VLS & VLC are obsoleted detectors, the replacement detectors will be shown later in this module.

VESDA VLF

IP 30

- Cost effective solution for small area applications
  - VLF-250 – 250m² (2690 ft²) (Follow Region Codes)
  - VLF-500 – 500m² (5380 ft²) (Follow Region Codes)
- Total pipe length up to 25m (80 ft) for VLF-250 & up to 50m (150 ft) for VLF-500.
- Maximum number of sample holes is 12 for VLF-250 and 24 for VLF-500
- 4 programmable alarm thresholds
- Out of the box setup
- On board fault diagnosis (IFF)
- Up to 18,000 event log memory
- AutoLearn smoke and flow
- Direct connect PC connection
- 2 Alarm and 1 Fault relays
- Ultrasonic flow sensing
- Additional Accessory cards
- Referencing for networkable version

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VESDA VLI Industrial Power and Filtration

IP 66

- Rugged IP66 Enclosure
- Intelligent Filtration
- Secondary filter with particle separator
- Ultrasonic Flow Sensors
- Field Replaceable Intelligent Filter, Aspirator, Secondary Filter, and Detection Chamber
- **Clean Air Zero**
- Ethernet or USB connectivity No WIFI available
- Up to 2,000m^2 (21520 ft^2) coverage (Follow Region Codes)
- 4 pipe inlets with individual flow sensors – Single Zone
- Metric and imperial pipe entry ports
- Total pipe length up to 360m (1181 ft)
- Maximum number of sample holes is 60
- AutoLearn Smoke and Flow
- Five (5) relays (Fire, Fault, and 3 configurable)
- Referencing for networkable version

Model Variants:

VLI-880, Stand alone

VLI-885, VESDAnet network

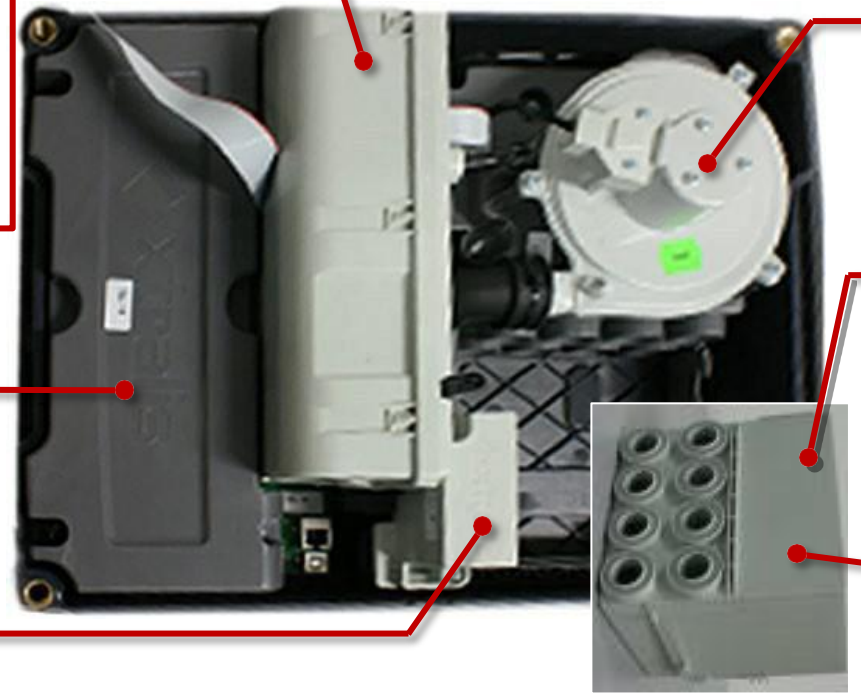
VLI Reliability

High sensitivity smoke detection chamber assembly including absolute smoke detection and clean air barrier together with Clean Air Zero and chamber flow detection, (field replaceable)

Electrostatic Discharge (ESD) cover protecting electronics

Secondary filter and sampling probe assembly rejecting heavier dust particles, (field replaceable)

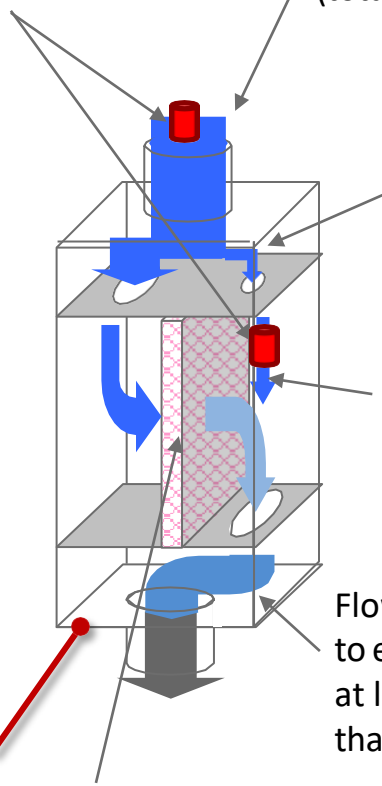
Inside View



High efficiency, aspirator placed after the Intelligent Filter for prolonged detector operation, (field replaceable)

Additional Lint Trap to capture fibrous particulates

Patented fail-safe intelligent filter extending detector life and providing consistent sensitivity over the entire life of the detector, (field replaceable)



VESDA Accessories

VHH-100
Handheld programmer

VHX-0200 (Xtralis VSC, VSM4)

VHX-0320 (Access Protocol)

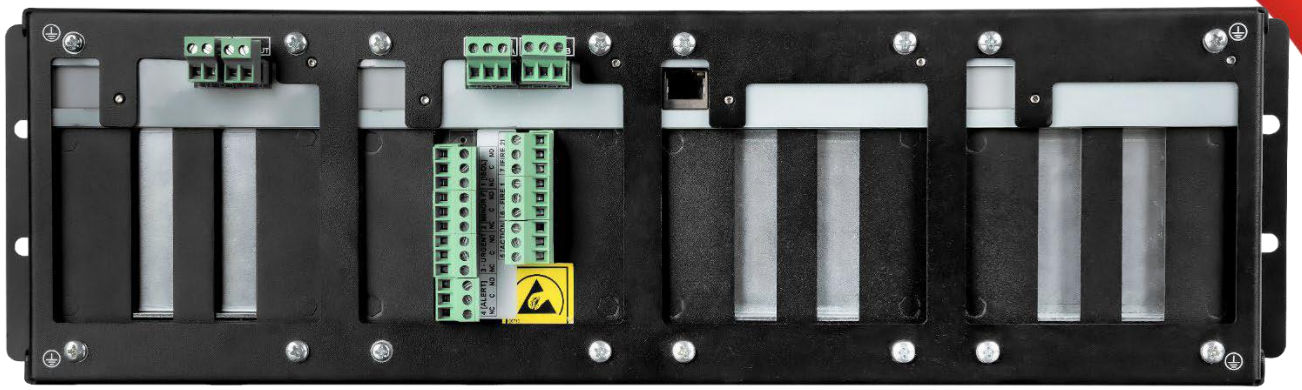
VHX-0420 (MODBUS Type 3)

VHX-1200

- High Level Interface
- Suitable for VSM4 PC
- VRT-300 & VXH-0200 in one box
- 1 RS232 lead out to PC
- Also VHX-1320/1420

VESDA-E Remote Range

Description	Remote Module	Sub-Rack Module
VE Remote Display No Relays	VER-A10-0	VEK-A10-0
VE Remote Display (7 Relays)	VER-A10-7	VEK-A10-7
VE Remote Display (12 Relays)	VER-A10-12	VEK-A10-12
VE Access Point	VER-A30	VEK-A30
VE Remote Relays (7 Relays)	VER-A40-7	VEK-A40-7
VE Remote Relays (12 Relays)	VER-A40-12	VEK-A40-12
Sub-Rack Box		VEK-0
19" Sub-Rack		VEK-0000



VEK-A10-0 | VEK-A40-7 | VEK-A30 | VEK-0

VER-A10-0

VER-A40-7

Comparison Summary Based On New SKU's

Wall Mounting






Old SKU	Description	Old SKU Detector Support	New SKU Detector Support	New SKU
VRT-600	Remote VLP Display - 0 relays	VLP	VEP, VEU, VEA, VES VLP, VLS, VLC, VLI, VLF	VER-A10-0
VRT-700	Remote VLS Display - 0 relays	VLS		
VRT-K00	Remote VLC Display - 0 relays	VLC		
VRT-T00	Remote VLI Display - 0 relays	VLI		
VRT-W00	Remote VLF Display - 0 relays	VLF		
VRT-200	Remote VLP Display - 7 relays	VLP	VEP, VEU, VEA, VES VLP, VLS, VLC, VLI, VLF	VER-A10-7
VRT-400	Remote VLS Display - 7 relays	VLS		
VRT-J00	Remote VLC Display - 7 relays	VLC		
VRT-Q00	Remote VLI Display - 7 relays	VLI		
VRT-V00	Remote VLF Display - 7 relays	VLF		
VRT-800	Remote VLS Display - 12 relays	VLS	VLS, VES	VER-A10-12
VRT-300	Remote VESDAnet Socket	VESDAnet Repeater	Ethernet, USB–B TYPE	VER-A30
VRT-500	Remote Processor Only (VLP) - 7 relays	VLP	VLP, VEP, VEU, VEA	VER-A40-7
VRT-E00	Remote Processor Only (VLS) - 7 relays	VLS	VLS, VES	
VRT-S07	SRM	SRM	SRM	
VRT-900	Remote Processor Only - 12 relays	VLS	VLS, VES	VER-A40-12





VESDA 3rd Generation

VESDA E Series

Product Overview

Built Upon Deep Core Competencies

*Broad Intellectual Property Portfolio including over 200 patents**

Air Sampling

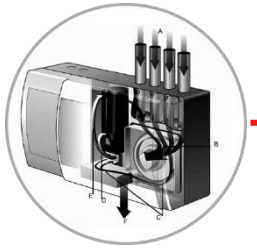
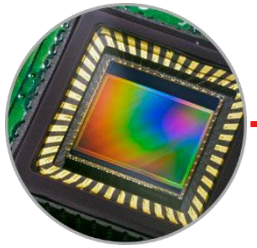
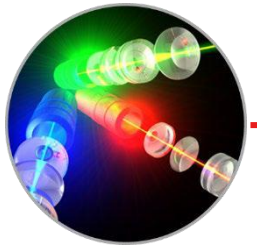


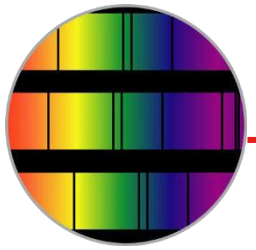
Image Processing



Optics



Interpretation of Light



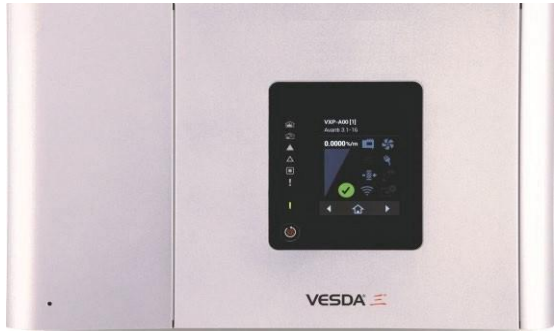
1. Air Sampling – in terms of our fluid mechanics expertise, ASPIRE modelling, and efficiency of operation

2. Image Processing – which involves physically looking at the particles to decipher their size, shape, colour

3. Optics – in terms of the high reliability laser light source and of course the measures we take to protect these critical components

4. Interpretation of light – this correlates to the use of light scattering principle

VESDA-E



VESDA®

Featuring:

- **VESDA Smoke+**
- VESDA Addressability
- VESDA Flex
- VESDA Connect
- VESDA TCO

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VESDA Smoke+

Superior Innovation-based Performance

Patented Flair ™ Detector Technology

- Ultra high-sensitivity for greater coverage in high airflow environments
- Inherent Absolute Calibration → Calibration for life
- Contamination resistance for lower total cost of ownership (TCO) in wider range of applications
- Particle classification to minimize nuisance alarms and enable targeted response
- Detection of very small particles for earlier detection in a range of applications

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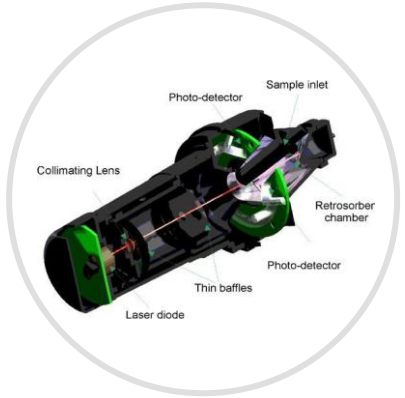
VESDA Smoke+

Intelligent Detection = Actionable Intelligence



VESDA Laser Series

101001101011010

- One sensor
- Particle Count

Light Scattering → Industry Leading Smoke Threat Detection

VESDA FLAIR

100110011010100
101001101011010
111011110101001
100010110010010

- Over 330k sensors (CMOS chip)
- Vastly more data

Actionable Information → Improved Efficiency and Stability

330,000 More Sensors!

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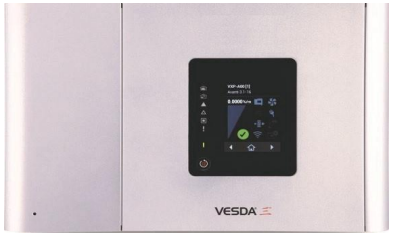
VESDA Smoke+

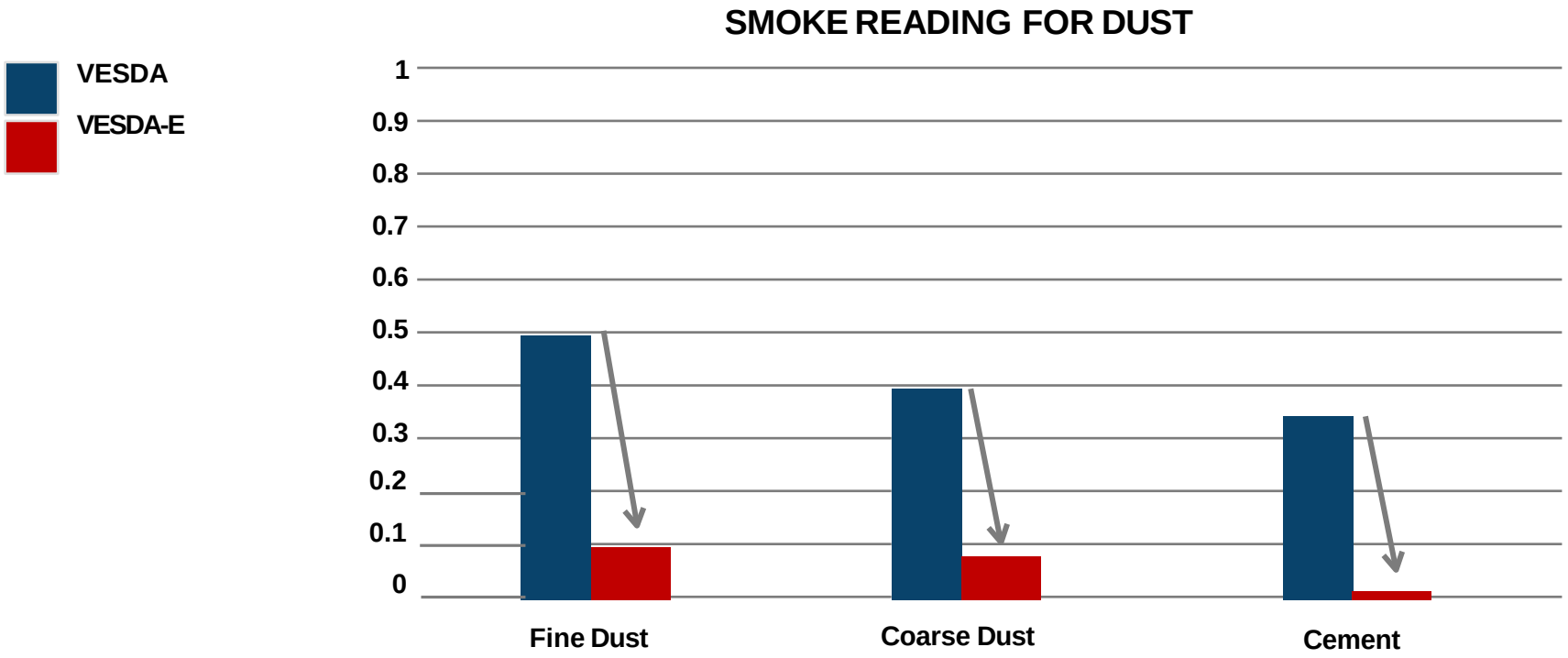
- VESDA-E is vastly better than benchmark VESDA detection with improved efficiency of operation



VESDA-E VEU	VESDA VLP
Sensitivity is greater by up to…	15X
Longevity is greater than…	2X
Coverage in high airflow is greater by…	40%
Power	
Power consumption per unit area is less by up to…	8%

VESDA Smoke+

Detection Reliability – Minimizing Nuisance Alarms



VESDA-E provides up to 6 times better dust rejection

VESDA VEU

IP 40

- Up to 6500 m² (69965 ft²) coverage area (As per Codes)*
- 4 pipe inlets with individual flow sensors – Single Zone
- 4 programmable alarm thresholds 0.001 – 20% obs/m (0.0003 to 6.25% obs/ft)
- 7 programmable relays
- 20,000 events in event log
- Ethernet & USB connectivity
- Metric and imperial pipe entry ports
- Networkable (VESDAnet)
- AutoLearn smoke & flow
- Day/Night smoke thresholds
- 800m (2625ft) total pipe length
- Maximum number of sample holes is 100
- Two programmable GPIs (1 monitored)
- Referencing

Model Variants:

LED's Version & 3.5" Display Version

* System design and regulatory requirements may restrict the monitoring area to a lesser amount

VESDA VEP (4 Pipes)

- Up to 2000 m^2 (21520 ft^2) coverage area (As per Codes)
- 4 pipe inlets with individual flow sensors – Single Zone
- 4 programmable alarm thresholds 0.005 – 20% obs/m (0.0016% to 6.25% obs/ft)
- 7 programmable relays
- 20,000 events in event log
- Ethernet & USB connectivity
- Metric and imperial pipe entry ports
- Networkable (VESDAnet)
- AutoLearn smoke & flow
- Day/Night smoke thresholds
- 560m (1837 ft) total pipe length
- Maximum number of sample holes 100
- Two programmable GPIs (1 monitored)
- Referencing

Model Variants:

LED's Version & 3.5" Display Version

VESDA VEP-A00-1P

- **Up to 10,760 ft² coverage area** (As per Codes)
- 1 pipe inlet
- 4 programmable alarm thresholds 0.005 – 20% obs/m (0.0016% to 6.25% obs/ft)
- 7 programmable relays
- 20,000 events in event log
- Ethernet & USB connectivity
- Metric and imperial pipe entry ports
- Networkable (VESDAnet)
- AutoLearn smoke & flow
- Day/Night smoke thresholds
- 130m (427 ft) total pipe length
- Maximum number of sample holes 45
- Two programmable GPIs (1 monitored)
- Referencing

Only Available with LED's

VESDA VES

- Up to 2000 m^2 (21520 ft^2) coverage area (As per Codes)
- 4 pipe inlets with individual flow sensors
- **Sector Addressability**
- 4 programmable alarm thresholds (**one each per pipe**) 0.0016% to 6.25% obs/ft
- 12 programmable relays
- 20,000 events in event log
- Ethernet & USB connectivity
- Metric and imperial pipe entry ports
- Networkable (VESDAnet)
- AutoLearn smoke & flow
- Day/Night smoke thresholds
- 560m (1837 ft) total pipe length
- Maximum number of sample holes 100
- Two programmable GPIs (1 monitored)
- Referencing

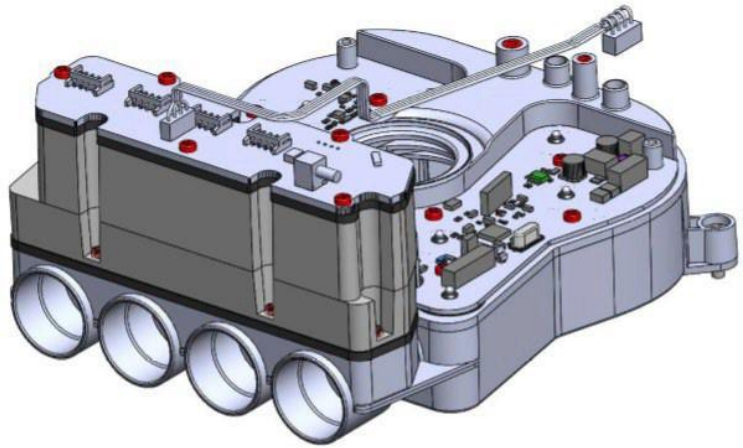
Model Variants:

LED's Version & 3.5" Display Version

Sector Addressability

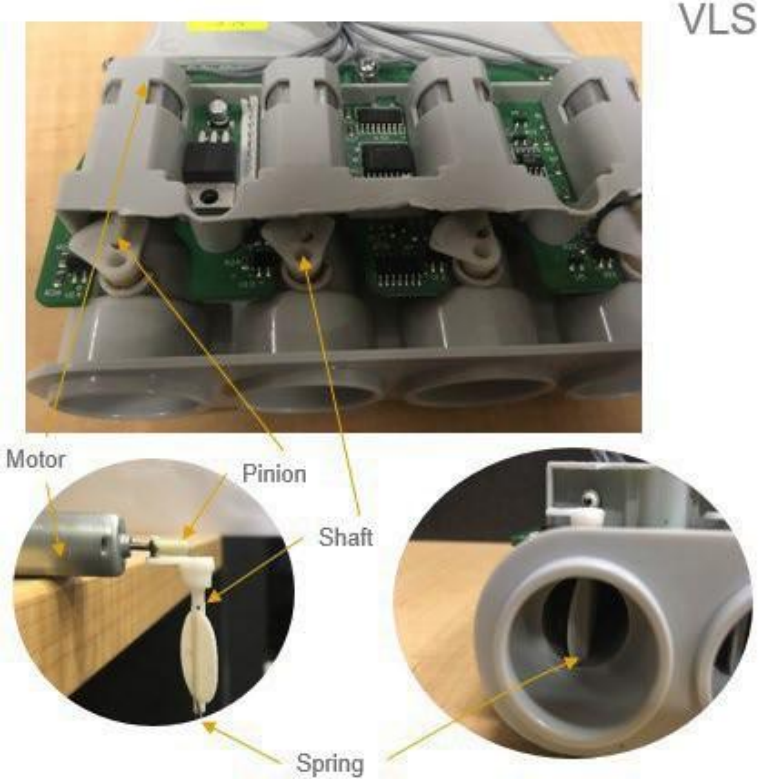
Principle of Operation

- The VES detector draws air from all sectors in use and if the smoke level reaches the Adaptive Scan Threshold, it initiates a Fast Scan of each sector to identify which sector is carrying smoke
- The first sector to reach the Alert Level is designated as the First Alarm Sector (FAS) and this sector is signalled to the User
- If two or more sectors reach the Alert level then, the sector with the highest smoke concentration is designated as the First Alarm Sector (FAS)
- Once FAS is identified, the VES continues to monitor all sectors to track fire growth and ultimately report Sector Fire Alarm to the panel



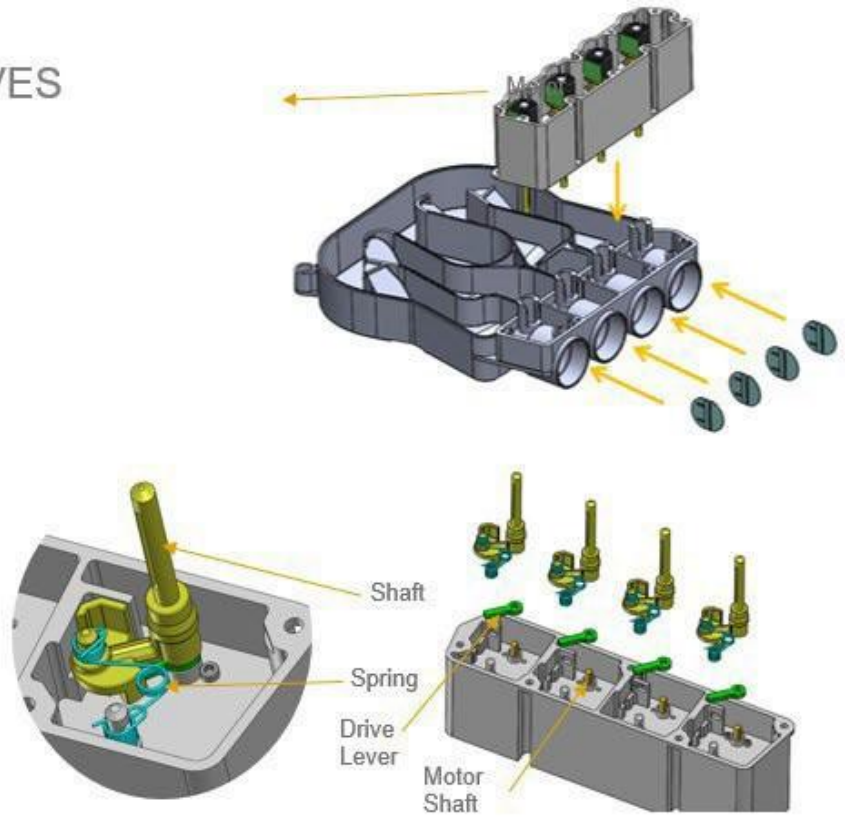
VES Scanner Manifold Design

VLS



- VLS design incorporates a gear mechanism to transfer DC motor rotation to valve shaft through 90 degrees (rack and pinion) with optical sensors to achieve “open” and “closed” position
- Design requires enough force via spring compression through the shaft onto the pinion to provide friction drive
- Requires precise manufacturing & assembly

VES



- VES design uses stepper motor to move valves between two positions only
- Design uses spring mechanism to toggle between “open” and “closed” position (spring does not apply continuous force)
- VES design is more robust and requires less stringent production control

VESDA-E VES vs VLS

Feature	VLS	VES	Sales Message
Detection Technology	IR Laser Detection	Flair Detection	Combining light scattering and image analysis Flair improves detection performance and stability and nuisance alarm rejection at the same time with no compromise. Flair is the only detection technology that can deliver this level of performance and longevity.
Fire 1 Threshold	0.015%/m (0.0046%/ft)	0.01%/m (0.003%/ft)	1.5 times the sensitivity for earlier warning and with minimum nuisance alarms because of Flair.
Pipe Length (Linear / Branched)	4 x 50m (4 x 164ft) 400m (1,312t)	4 x 70m (4 x 230ft) 560m (1,837ft)	Longer pipe runs allow greater flexibility and convenient detector mounting to reduce cost of maintenance
Sampling Holes (A/B/C)	30/60/100	40/80/100	Improved detection technology increases the number of sampling points for improved coverage
General Purpose Input	1	2	With an extra GPI there is greater flexibility in control. Both GPIs are programmable (one monitored typically for PSU monitoring) for greater flexibility
Relays	7 or 12	12	Provides 12 relays as a standard configuration allowing increased flexibility in Sector Alarm reporting
StaX	None	PSU, Auto Pipe Clean	Future proof expandability protecting end-user initial investment
Connectivity	Serial	USB, Ethernet	World class connectivity for unprecedented ease of monitoring and maintenance
Fully Field Replaceable	Partial	Yes	Reduced service and maintenance time and cost as key sub-assemblies are interchangeable in the field.
Display	LEDs	3.5” LCD	Touch screen display provides more intuitive and more informative status information
AutoLearn	Smoke	Smoke and Flow	In addition to Smoke; VES learns the flow conditions and sets individual sample pipe flow thresholds to accommodate varying environmental conditions

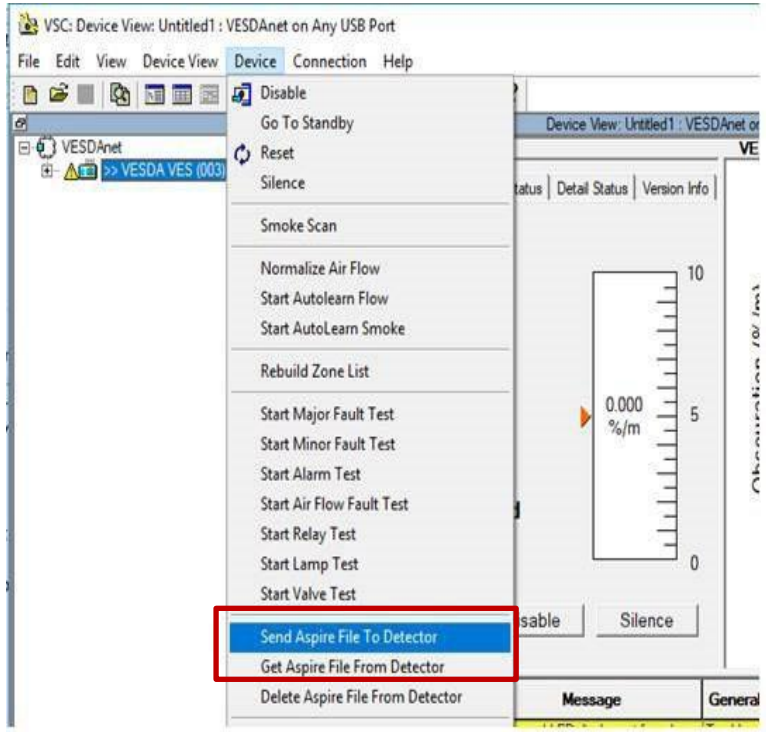
GA2 & GA3

- As part of ongoing product improvement program, the VESDA-E VEU/P product range moved to a new base line (GA3). The GA3 baseline introduces:
  - An internal buzzer that can be configured to signal alarm, fault, disable and standby conditions
  - A 7-segment display located next to the relays and USB port that indicates status and diagnostics during the boot-up and firmware upgrade process

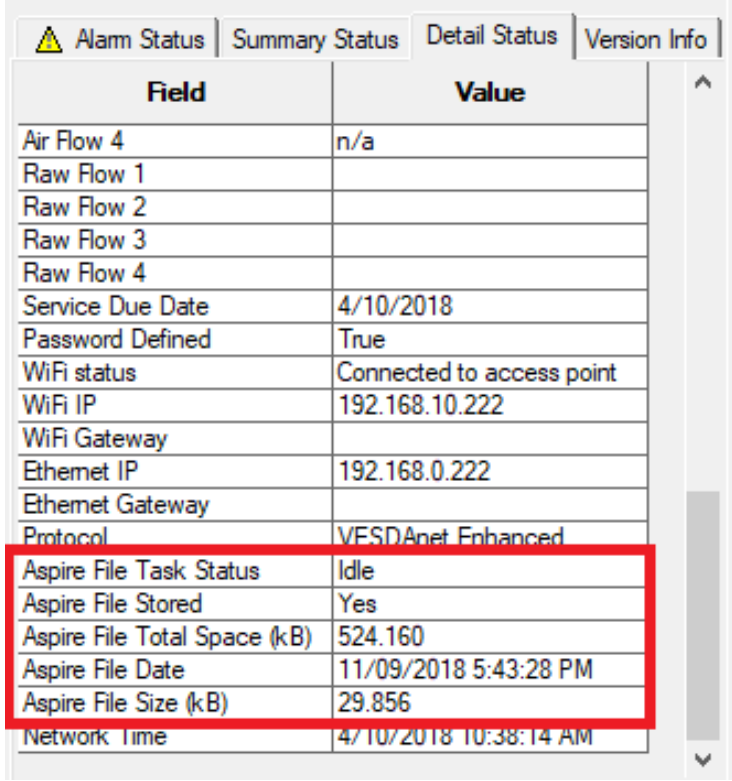
- The new GA3 platform has new hardware **so it is not possible to upgrade a GA2 detector to GA3**.

ASPIRE File Storing & Retrieving

- From the Device menu there are three added commands to Send, Get and Delete an ASPIRE file



- In the Detail Status there are fields to show the status of the ASPIRE file should one be stored in the detector



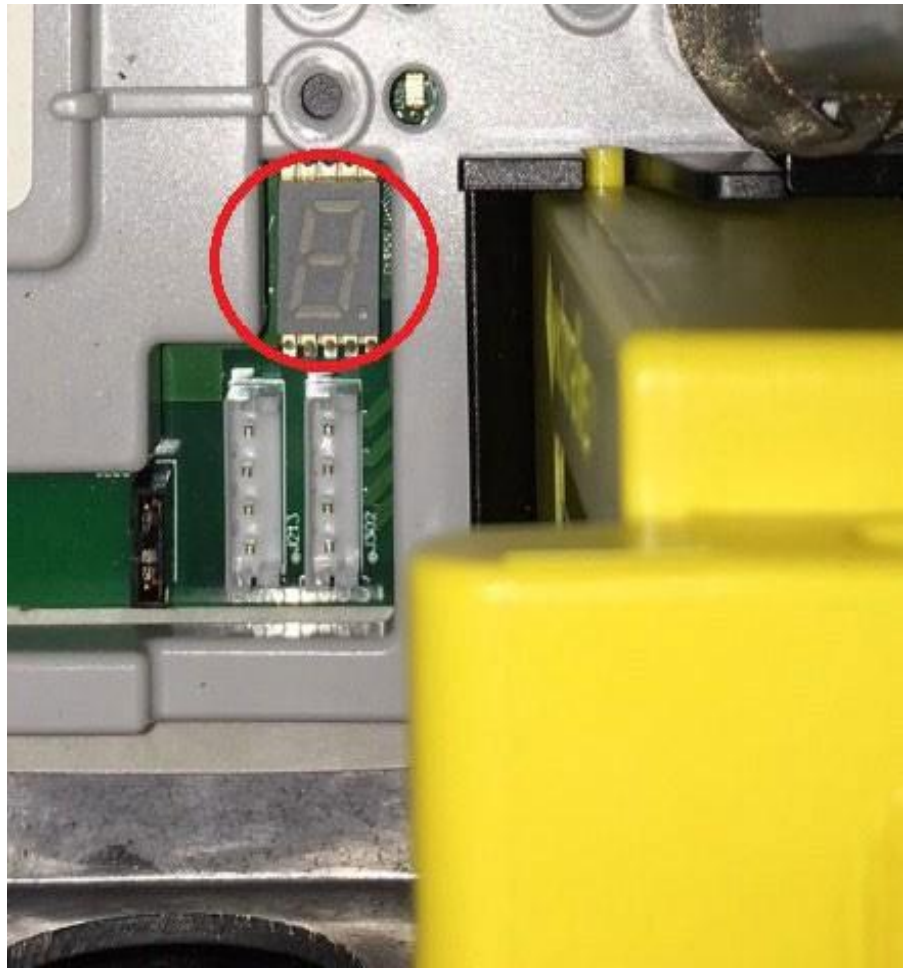
Field	Value
Air Flow 4	n/a
Raw Flow 1	
Raw Flow 2	
Raw Flow 3	
Raw Flow 4	
Service Due Date	4/10/2018
Password Defined	True
WiFi status	Connected to access point
WiFi IP	192.168.10.222
WiFi Gateway	
Ethernet IP	192.168.0.222
Ethernet Gateway	
Protocol	VESDAnet Enhanced
Aspire File Task Status	Idle
Aspire File Stored	Yes
Aspire File Total Space (kB)	524.160
Aspire File Date	11/09/2018 5:43:28 PM
Aspire File Size (kB)	29.856
Network Time	4/10/2018 10:38:14 AM

The available memory for Aspire files is 100kB.

What's New on GA3 Generation

Motherboard 7-Segment Display

- The 7 segment display is used for status and diagnostics during the boot-up and the USB upgrade process
- Enables technical personnel and field engineers to easily determine causes of firmware upgrade failure should it occur allowing expedient resolution

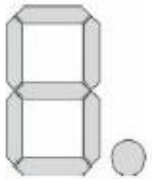


What's New on GA3 Generation

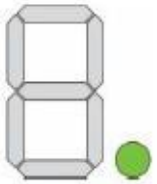
When the update is complete, the aspirator will start and the 7-segment display will show only its decimal point.

Wait TWO MORE minutes for the internal data to be stored. Do not turn off power at this time.

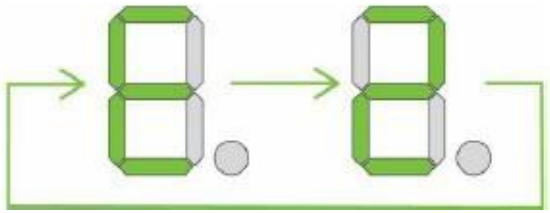
The 7-segment display (2) will show the result of the upgrade process.



When the upgrade process completes, the seven-segment display will show the success or error condition for the process:



Success is indicated with the decimal point illuminated and all other segments dark.



Error is indicated by the letter 'E' followed by one or two digits that form the error code. These characters are repeated with a delay before the 'E'.

Refer to the troubleshooting section to diagnose and recover from the error condition indicated.

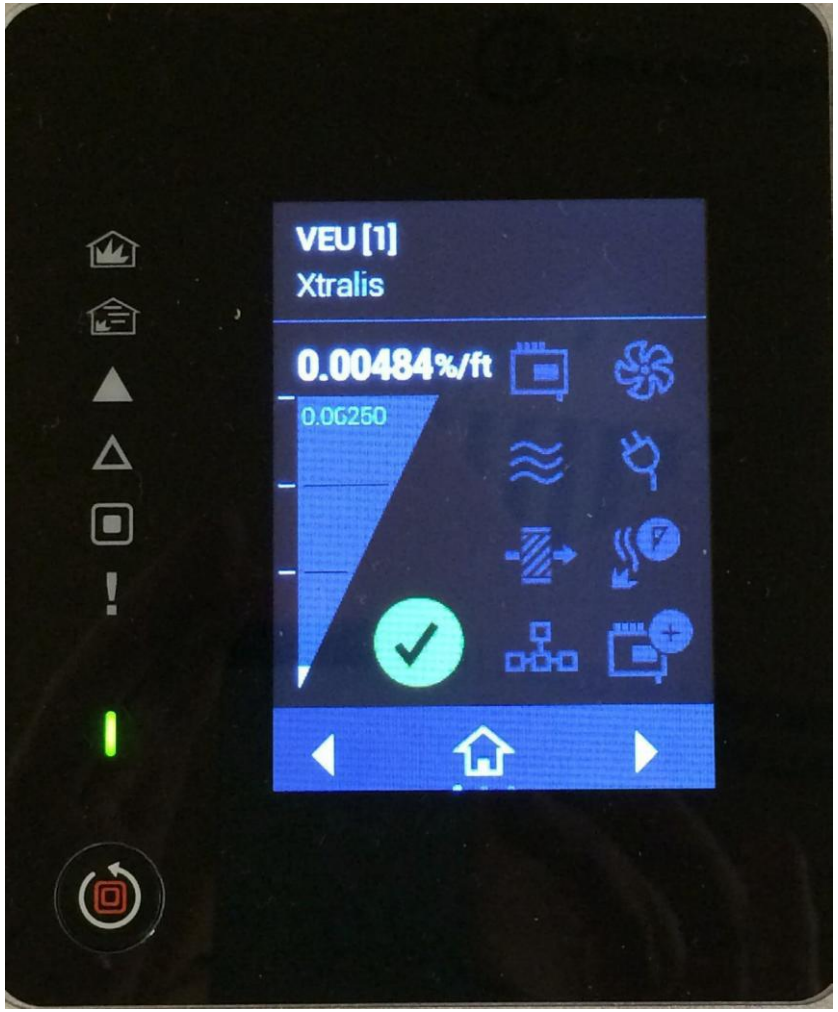
RESET/ DISABLE/ ACKNOWLEDGE Button

- A button allows the user to Acknowledge, Reset or Disable the detector
- If there is an alarm or fault condition pressing the button the first time will Acknowledge the condition
- To Reset the detector once all alarms and faults have been acknowledged, press this button once
- To Disable/Re-enable the detector, once all alarms and faults have been acknowledged, press and hold the button for approximately 4sec
- The button will not operate if the detector is Disabled through the GPI function, or the Reset / Disable button is configured as "locked out“
- The detector has a buzzer which can be configured to signal alarm, fault, disable and standby status
- Buzzer will beep every 30sec for Fault conditions and 60sec for Disable/Stand-by

LED Only Front Panel Display

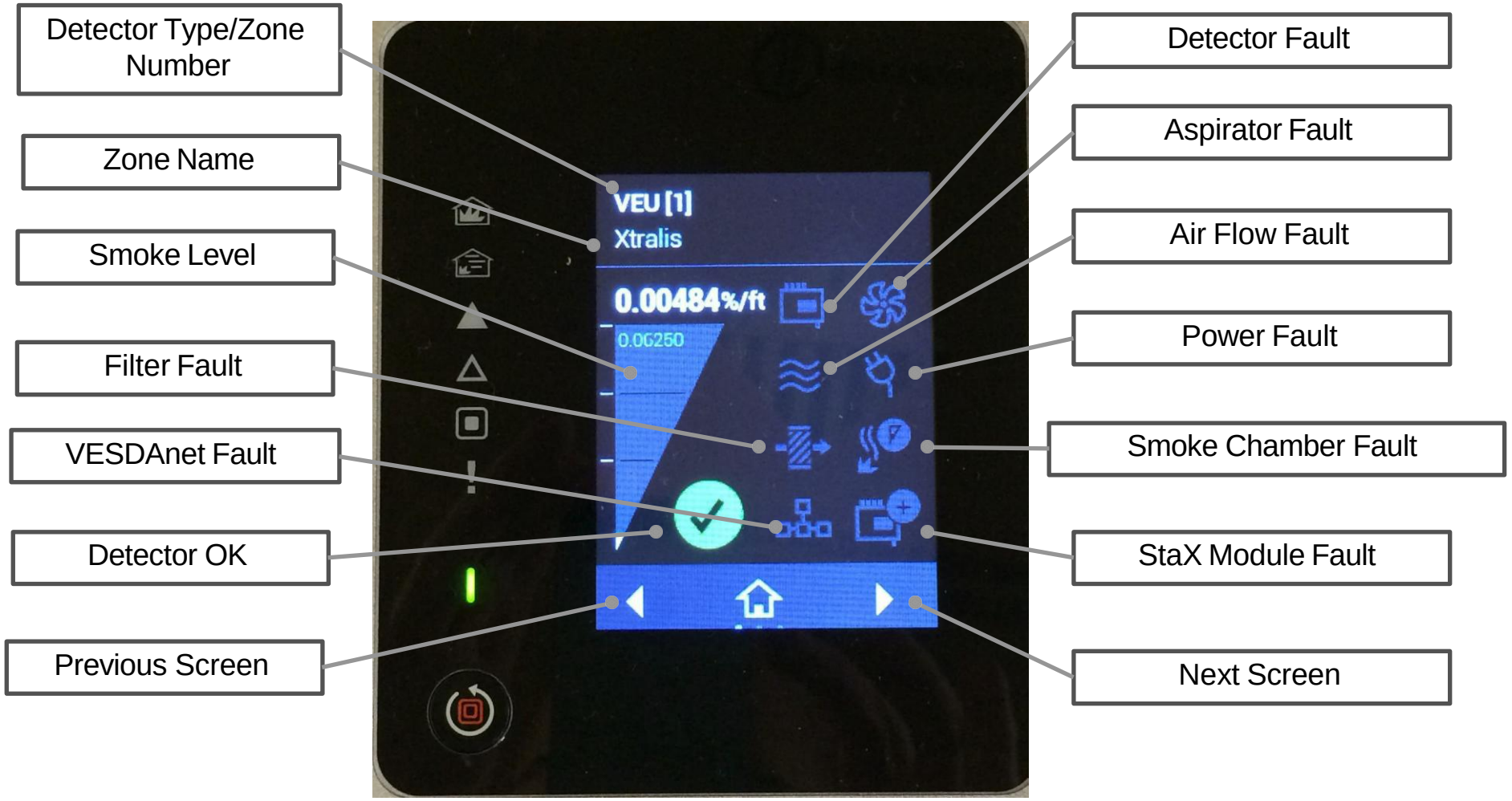
LED	Symbol	Description
Fire 2		The Fire 2 LED is lit when the Fire 2 Alarm threshold is reached.
Fire 1		The Fire 1 LED is lit when the Fire 1 Alarm threshold is reached.
Action		The Action LED is lit when the Action threshold is reached.
Alert		The Alert LED is lit when the Alert threshold is reached.
Disabled		The DISABLED LED is lit when the detector is disabled.
Fault		The FAULT LED is lit when a fault condition is detected. Refer to Chapter 8 for information on troubleshooting.
Power		The POWER LED illuminates when the detector is powered up.

3.5” Display Front Panel



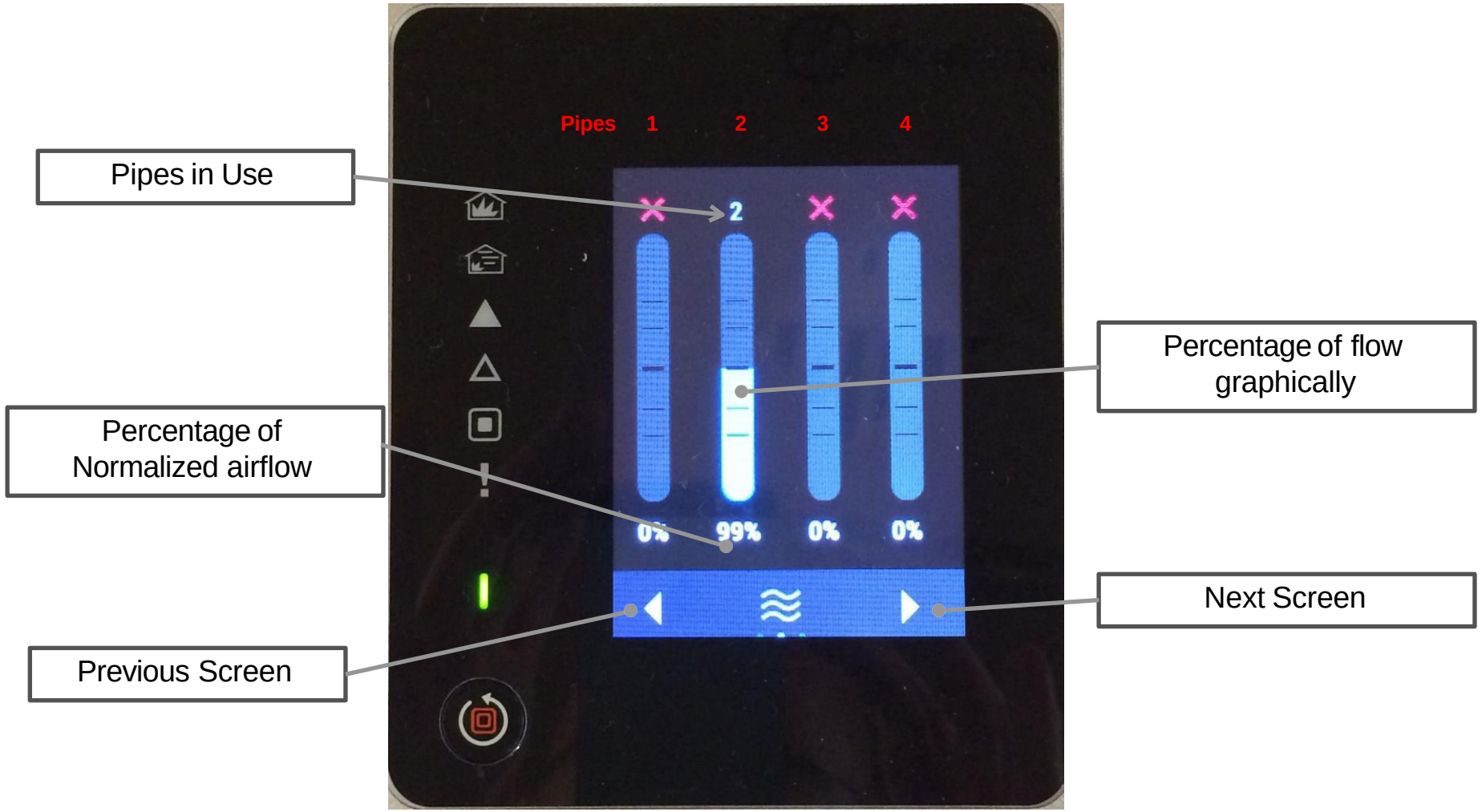
LED	Symbol	Description
Fire 2		The Fire 2 LED is lit when the Fire 2 Alarm threshold is reached.
Fire 1		The Fire 1 LED is lit when the Fire 1 Alarm threshold is reached.
Action		The Action LED is lit when the Action threshold is reached.
Alert		The Alert LED is lit when the Alert threshold is reached.
Disabled		The DISABLED LED is lit when the detector is disabled.
Fault		The FAULT LED is lit when a fault condition is detected. Refer to Chapter 8 for information on troubleshooting.
Power		The POWER LED illuminates when the detector is powered up.

3.5” Touch Screen Features



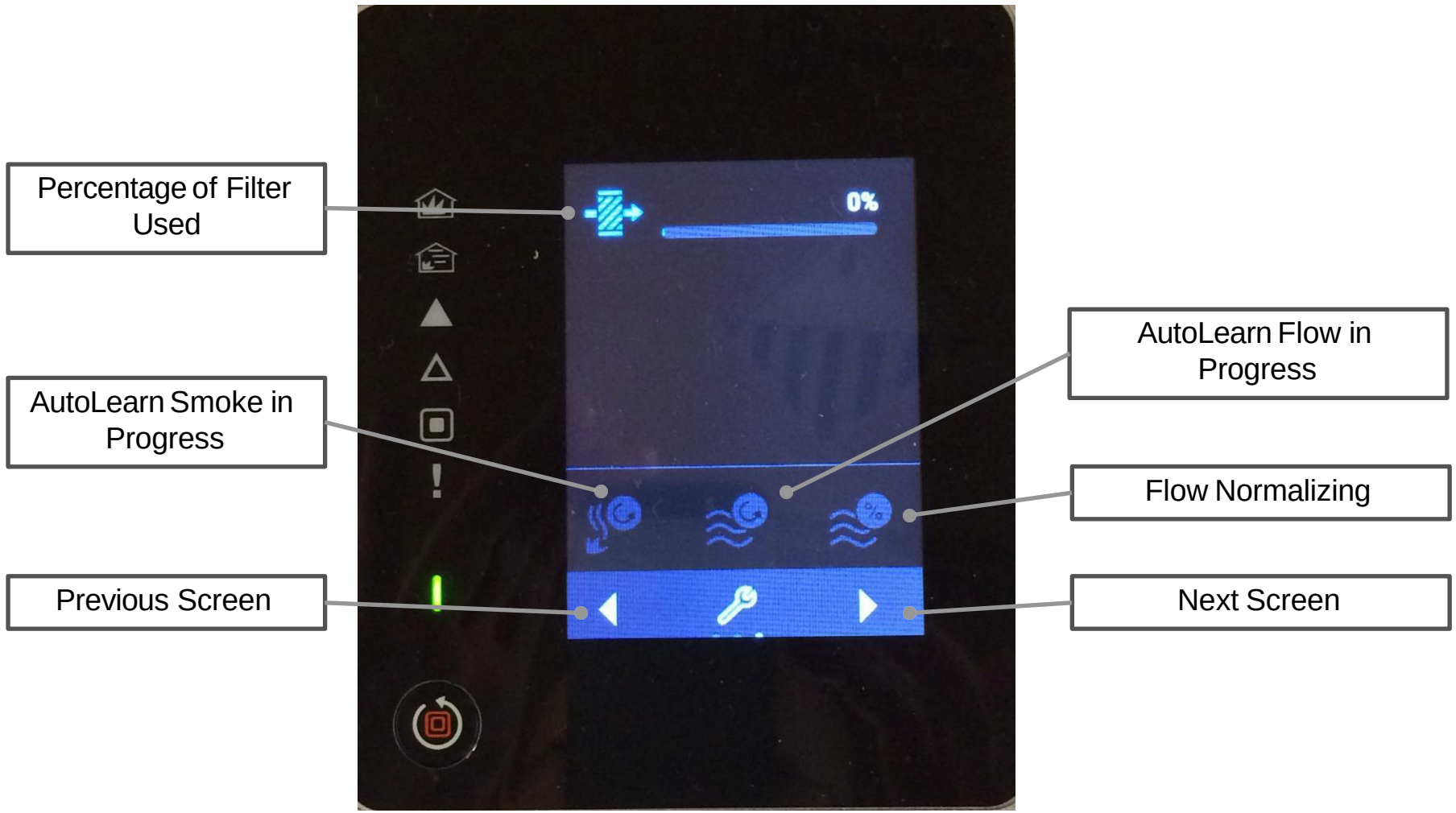
Main Screen

3.5” Touch Screen Features



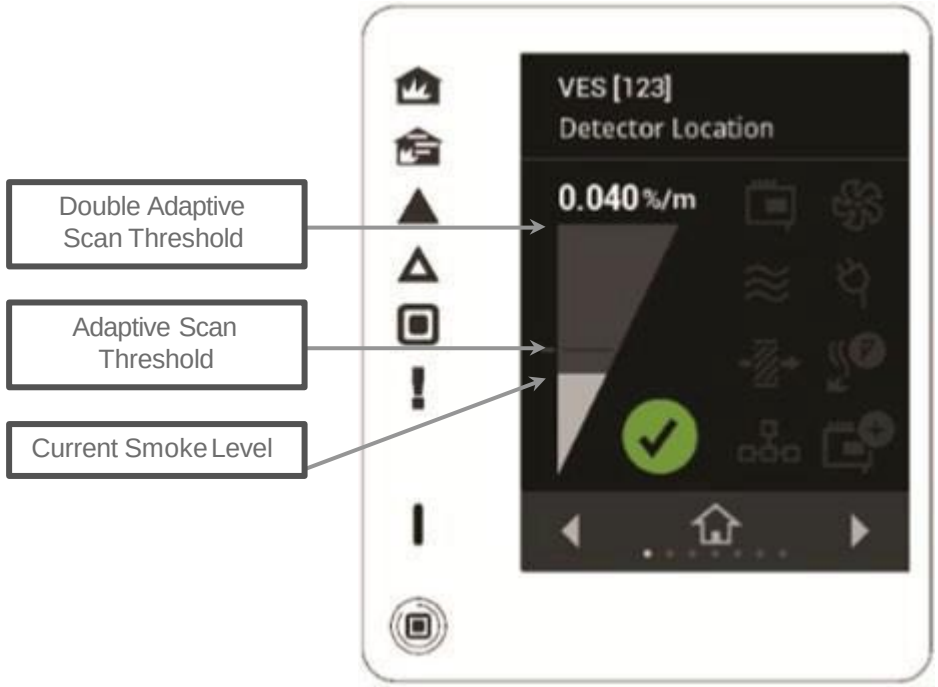
Air Flow Screen

3.5” Touch Screen Features

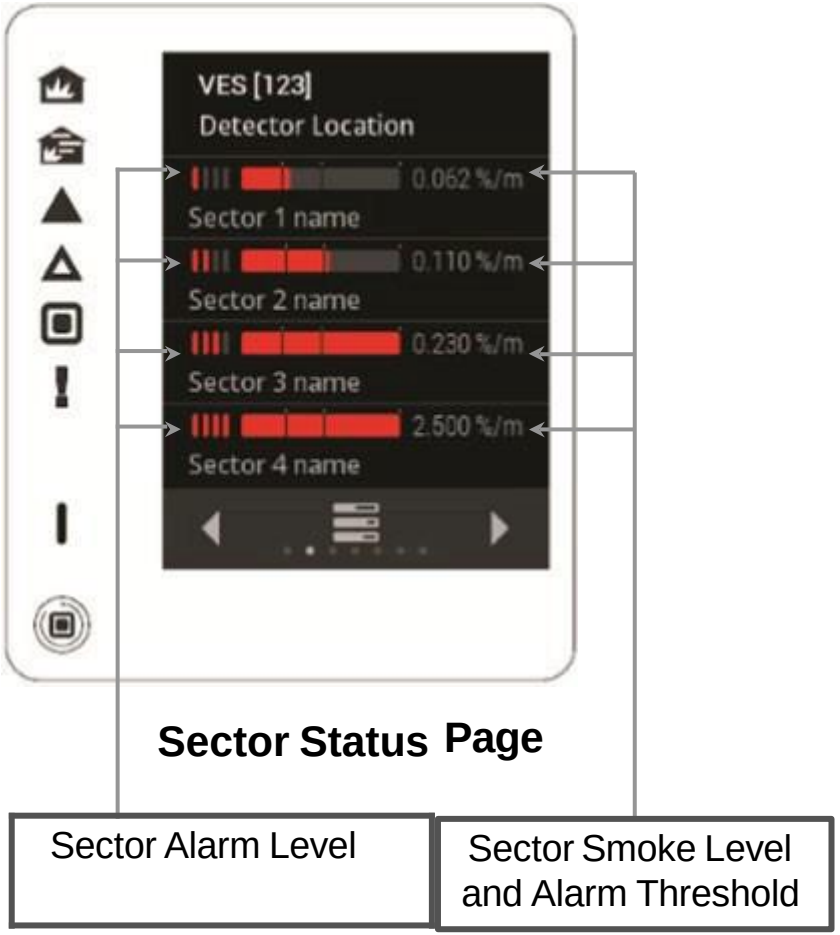


Status Screen

3.5” Touch Screen Additional Features for VES



VES Home Page



Sector Status Page

VESDA® ≡™

Featuring:

- VESDA Smoke+
- **VESDA Addressability**
- VESDA Flex
- VESDA Connect
- VESDA TCO

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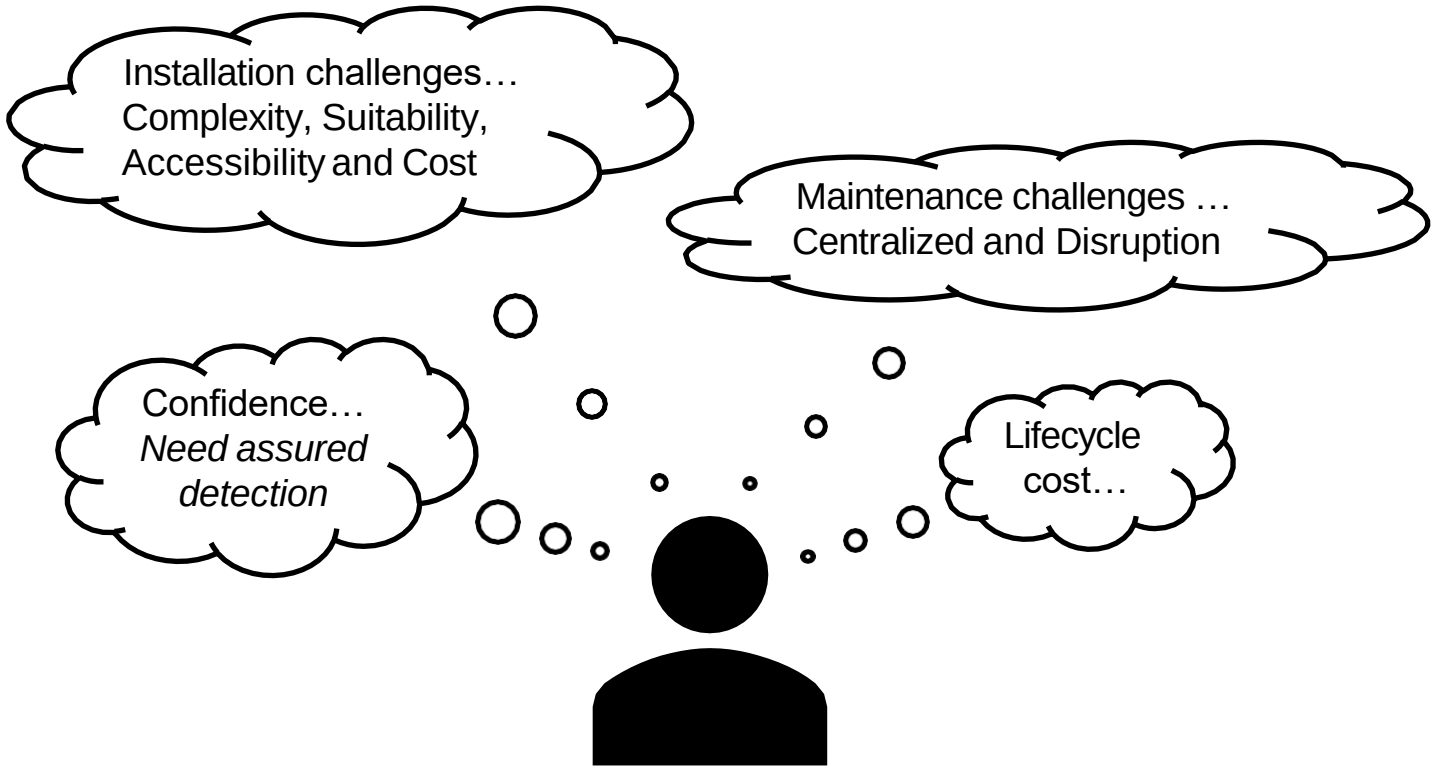
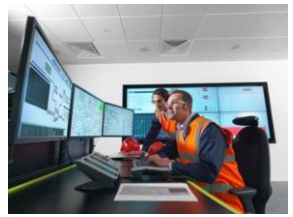
VESDA Addressability

Voice of Customer for smoke detection





VESDA Addressability

THE SOLUTION

An addressable aspirated smoke detector that is discreet, flexible to install and operate, provides end to end supervision and saves up to 90% service time

VESDA VEA

- 40 tubes inlet (pinpoint) – **Minimum 6 to be used**
- 7 programmable relays
- 20,000 events in event log
- Wi-Fi, Ethernet & USB connectivity
- Networkable (VESDAnet)
- 100m (328 ft) maximum tube length
- Two programmable GPIs (1 monitored)
- Selectable sampling point Fire alarm thresholds:
  - High (1.6%/m) [2.5 %/ft]
  - Enhanced (4%/m) [1.3%/ft]
  - Standard (8%/m) [0.5%/ft]

3 Alarm Threshold Settings

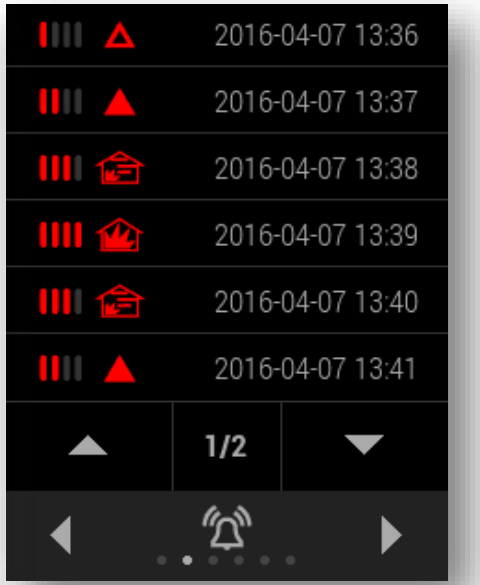
IP 40

Model Variants:

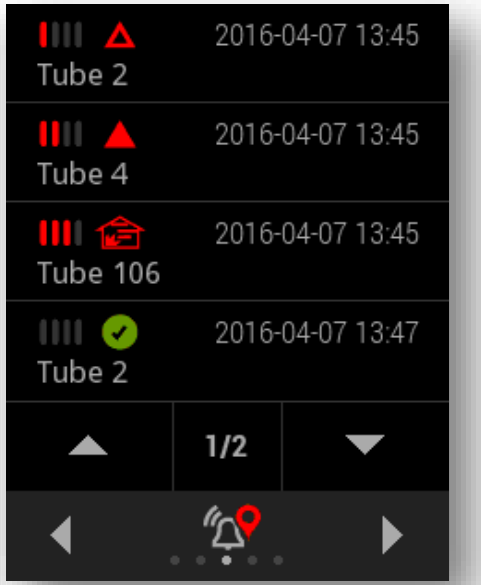
LED's Version & 3.5" Display Version

VEA 3.5” Display

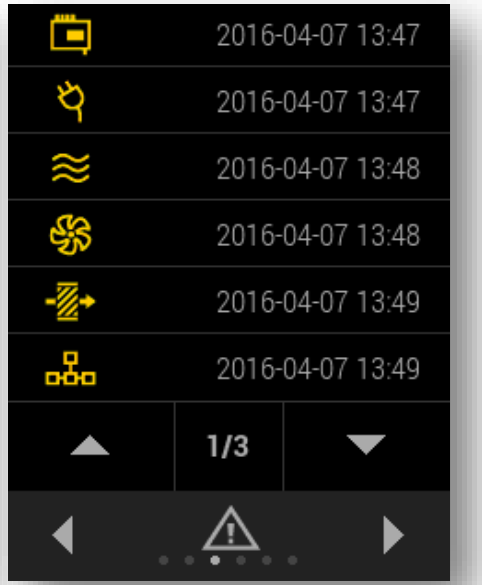
Normal



Alarm



Tube Alarm

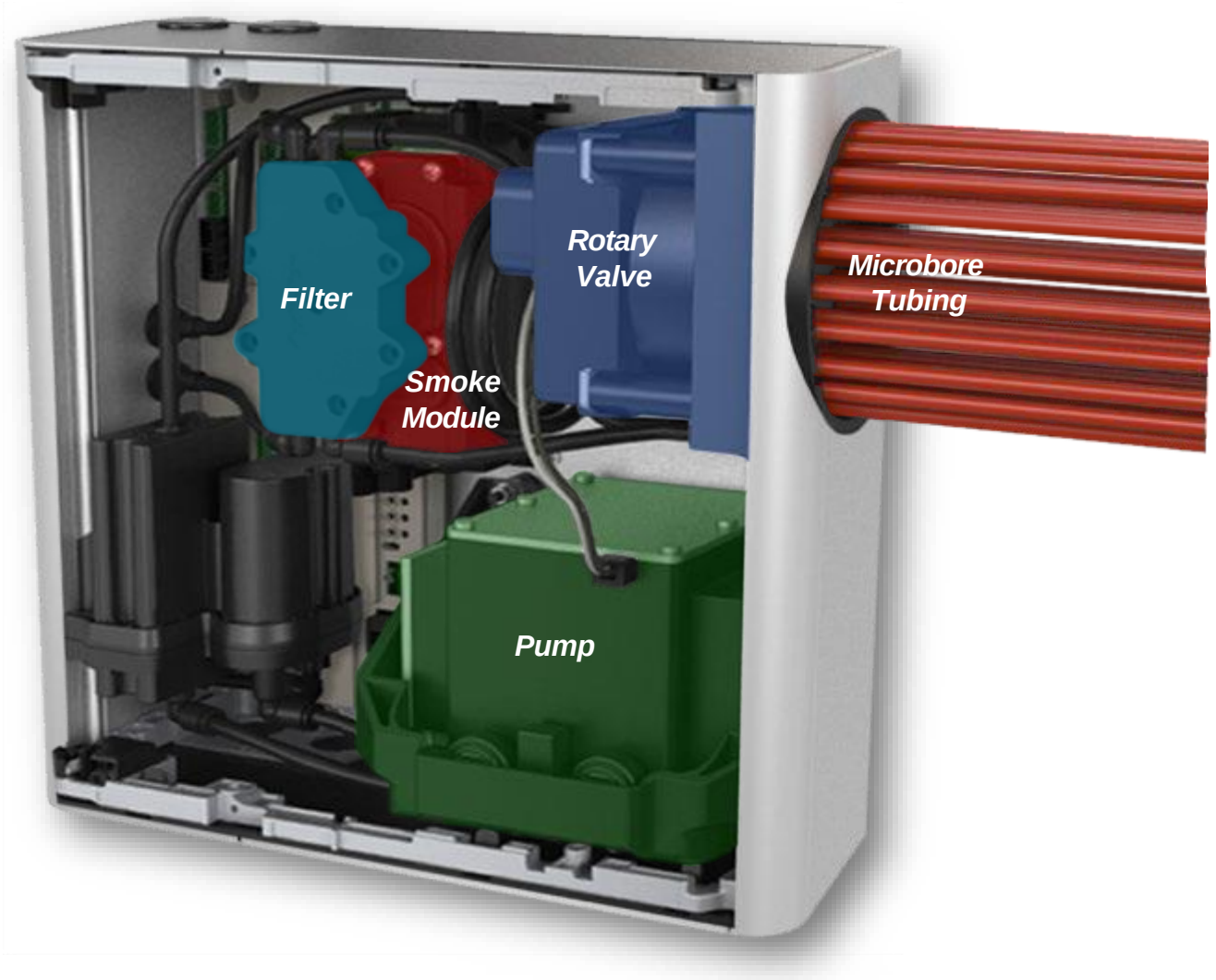


Fault

Additional screen functions are as the VEU, VEP

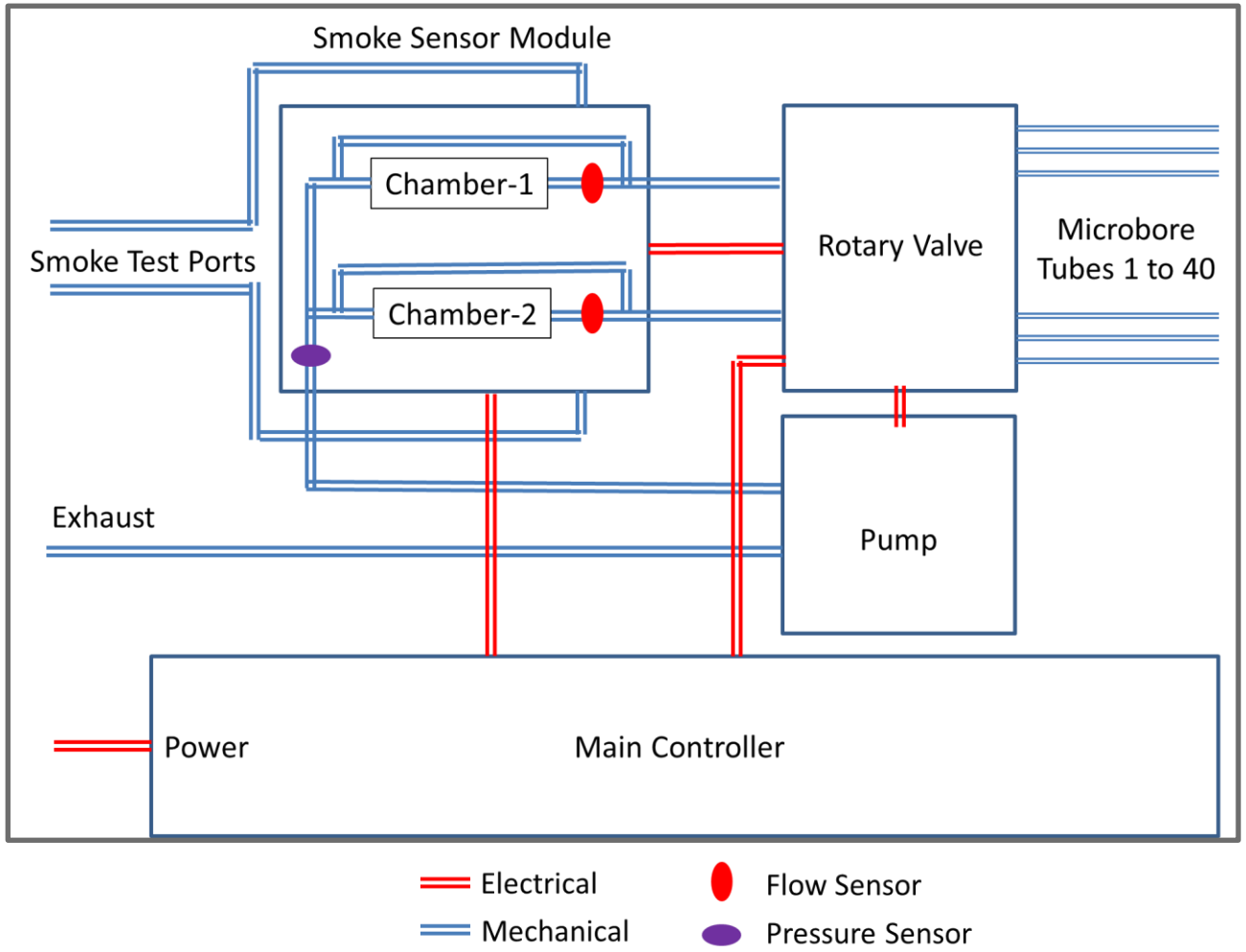
VEA Solution

- Air sampling
- Active performance
- Linear high tech capacity vacuum pump technology
- Modular build
- One device = 40 addressable sampling points



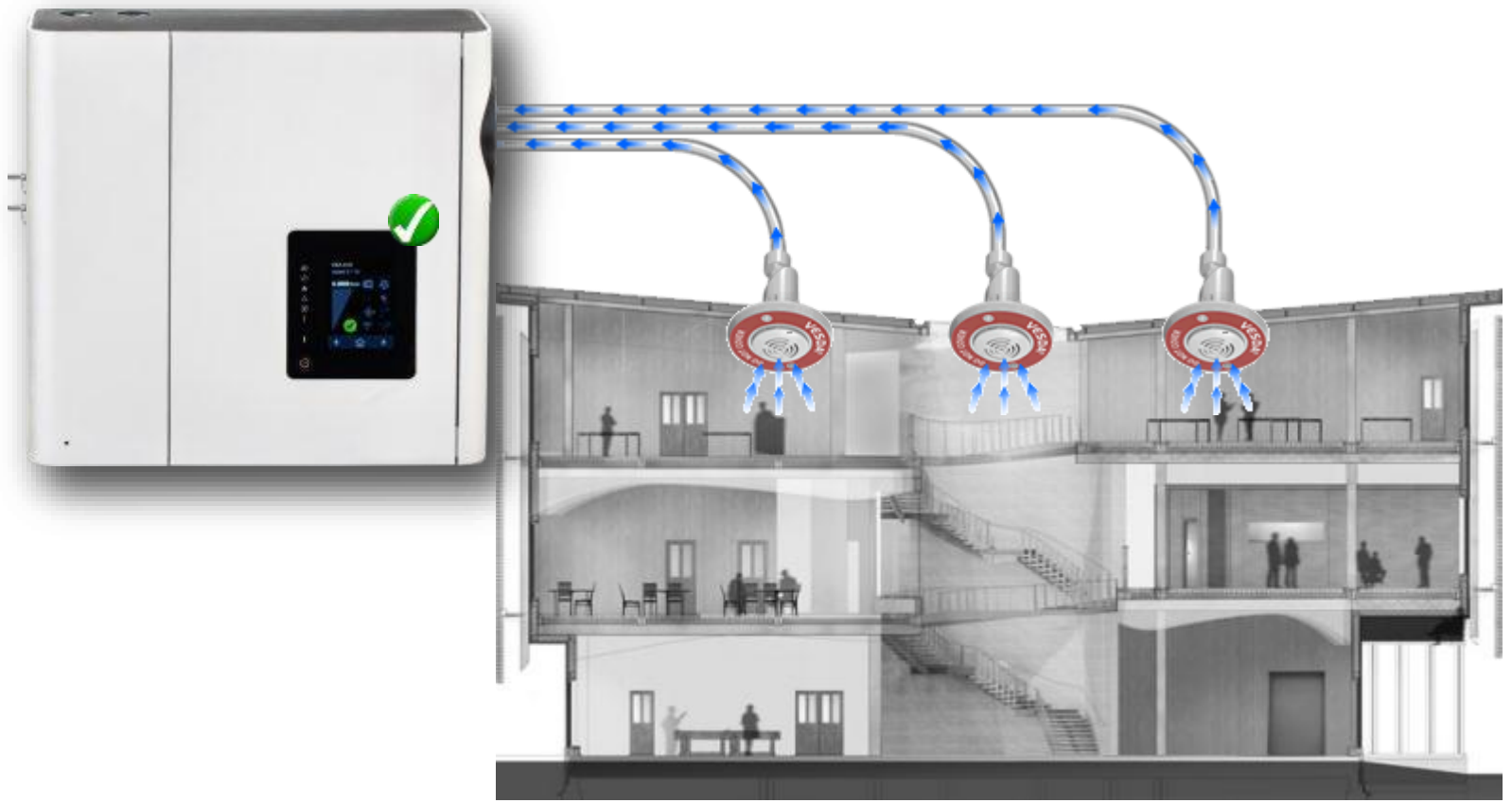
VEA Basic Architecture

The red lines represent electrical connections and the blue lines represent sample air movement.



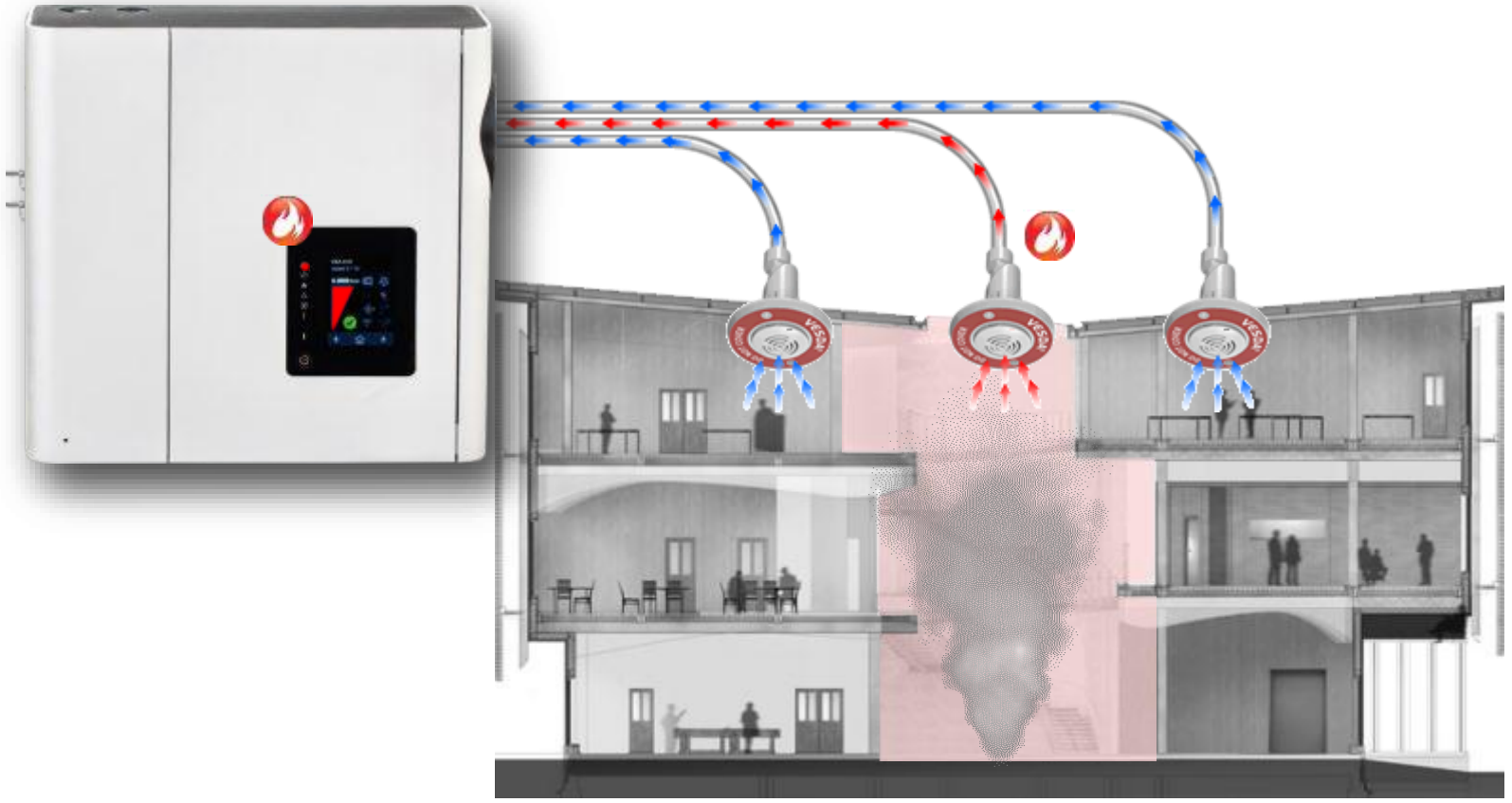
Operation (Monitoring State)

- Actively samples through all ports simultaneously



Operation (Smoke Event)

- Upon detection of smoke raises global alarm then scans each tube
- Scanning identifies the smoke source by tube



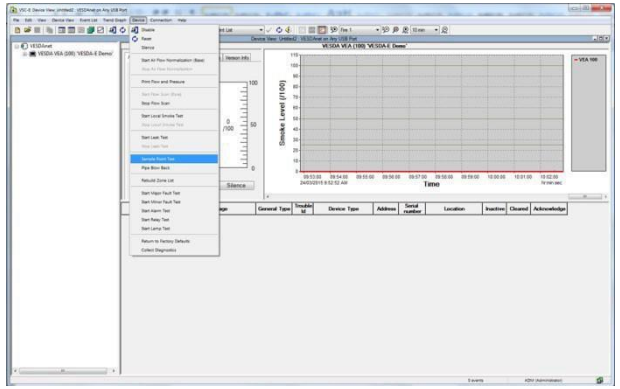
Centralized Attributes

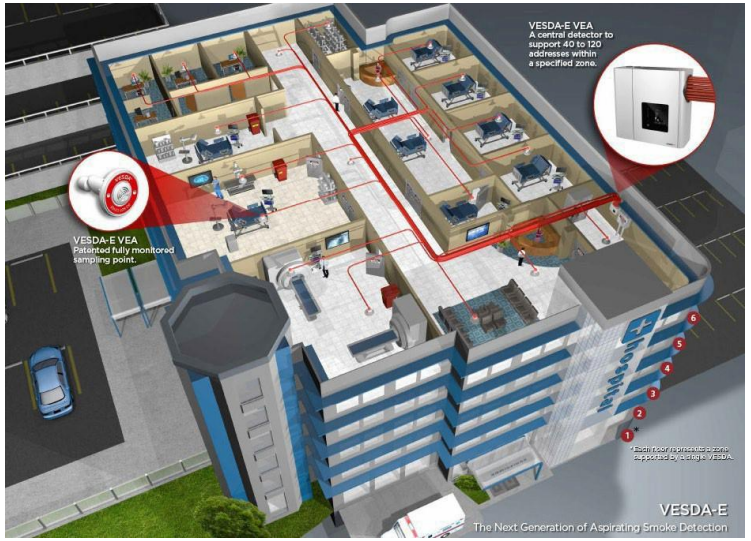
- Secure
- One man operation
- No special tools or equipment

Centralized Attributes

All automated tests can be selectively done manually after servicing

- Centralized manual testing for blockage, breakage or self cleaning
- Centralized smoke testing at detector
- No need to test at remote locations
- One man operation
- No special tools required
- Secure





VESDA®

Featuring:

- VESDA Smoke+
- VESDA Addressability
- **VESDA Flex**
- VESDA Connect
- VESDA TCO

VESDA Flexibility

Future-proof expandability for maximum flexibility

StaX

Hardware expansion modules that easily bolt onto the VESDA-E detector to add additional capabilities
(For now, available Stax are VEA Relays Stax)

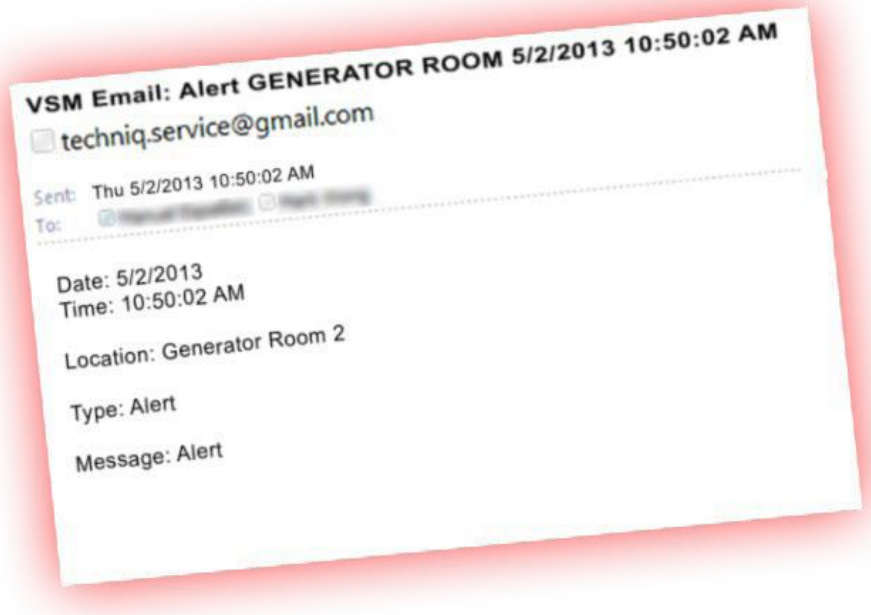
VESDA®

Featuring:

- VESDA Smoke+
- VESDA Addressability
- VESDA Flex
- **VESDA Connect**
- VESDA TCO

VESDA Ethernet

- Enables connectivity with Xtralis VSC and VSM4
- Allows superior connectivity for monitoring by RMS for smoke trends, standard output, and alert/alarm information



VESDA®

Featuring:

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- VESDA Flex
- VESDA Connect
- **VESDA TCO**

CapEx Value

VESDA-E Value Delivers Immediate Returns

- 15x higher sensitivity than VLP providing at least 40% greater coverage in high airflow applications
- Longer pipe runs provide up to 80% greater coverage in high ceiling applications
- Increased detector coverage in high airflow and high ceiling applications reduces installation cost
- Centralized detection reduces maintenance time and cost

Backward Compatible

Easy upgrade while protecting your investment

- Same footprint on wall as prior generation VESDA
- Same conduit pitch as VESDA VLP
- Same relays order for VESDA VLP and VLS
- Compatibility with VESDAnet – gateway into existing VESDA

Affected Products & Alternatives

Legacy Laser Detector	Replacement VESDA E Offering
VLP-400	VEP-A00-P
VLP-002	VEP-A10-P
VLP-012	VEP-A10-P
VLS-600/ VLS-700	VES-A00-P
VLS-204/ VLS-304	VES-A10-P
VLS-214/ VLS-314	VES-A10-P
VLC-500	VEP-A00-1P / VLF-500-01
VLC-505	VEP-A00-1P / VLF-500-01

Legacy Laser Detector	Replacement VESDA E Offering
VLC-600	Future Replacement
VLC-605	Future Replacement
VLC-400	Discontinued
VLC-800	Future Replacement
VLC-MRN (Both 500 & 505)	Discontinued
VLC-EX-US (Both 500 & 505)	Discontinued
VLC-EX (Both 500 & 505)	Future Replacement

VESDA Model Comparison Chart

Doc. Ref. Number: 18327

FEATURES	VEU	VEP		VES	VEA	VLF 250/500	Industrial VESDA VLI
		VEP 1-pipe	VEP 4-pipe				
Pipes and Area Coverage							
Pipe Length (Linear)	400 m (1,312 ft)	100 m (328 ft)	280 m (919 ft)	280 m (919 ft)	40 x 100 m (40 x 328 ft)	25 / 50 m (82 / 164 ft)	360 m (1,181 ft)
Pipe Length (Branched)	800 m (2,624 ft)	130 m (427 ft)	560 m (1,837 ft)	560 m (1,837 ft)	N/A	30 / 60 m (98 / 197 ft)	445 m (1,460 ft)
Area Coverage	6,500 m²* (69,965 sq.ft)	1,000 m² (10,760 sq. ft)	2,000 m² (21,520 sq. ft)	2,000 m² (21,520 sq. ft)	2,000 m² (21,520 sq. ft) across 40 sample holes	250 / 500 m² (2,690 / 5,380 sq. ft)	2,000 m² (21,520 sq. ft)
No. of Pipe Inlets	4	1	4	4	40	1	4
Multiple Pipe Addressability	No	No		Up to 4	Up to 40	No	No
Sensitivity							
Min Fire 1 Threshold	0.001% obs/m (0.0003% obs/ft)	0.01% obs/m (0.0031% obs/ft)		0.01% obs/m (0.0031% obs/ft)	1.6% obs/m (0.5% obs/ft)	0.025% obs/m (0.008% obs/ft)	0.15%/m (0.046%/ft)
Detection Range	0.001 - 20.0% obs/m (0.0003 - 6.25% obs/ft)	0.005 - 20% obs/m (0.0016% - 6.25% obs/ft)		0.005 - 20% obs/m (0.0016% - 6.25% obs/ft)	0.020 - 16% obs/m (0.006 - 4.88% obs/ft)	0.025 - 20% obs/m (0.008 - 6.25% obs/ft)	0.005 - 20.0% obs/m (0.0016 - 6.25% obs/ft)
EN54-20 (Class A/B/C)							
Max. no of Holes (Class A / B / C)	80 / 80 / 100	30 / 40 / 45	40 / 80 / 100	40 / 80 / 100***	40 - 40**	VLF 250 12 / 12 / 12; VLF 500 30 / 30 / 30	24 / 28 / 60
Sampling Point Sensitivity (%obs/m)	1.5 / 3 / 8	1.5 / 3 / 8		1.5 / 3 / 8***	1.6 / 4 / 8	1.5 / 4.5 / 10	1.5 / 4.5 / 10
Transport Time (seconds)	70 / 90 / 110	60 / 90 / 110		60 / 90 / 90***	40 - 90 (Tube length dependent)	VLF 250 60 / 60 / 60 VLF 500 90 / 90 / 90	60 / 90 / 120
Others							
Hazardous Area Approval (FM Class 1, Div 2, Groups A, B, C, D)	No	Yes		No	N/A	Yes	Yes
IP Rating	IP40	IP40		IP40	IP40	IP30	IP66
Two Stage Filtration	Yes	Yes		Yes	Yes	Yes	Patented Intelligent Filter Secondary Foam Filter Sub-sampling Probe

* System design and regulatory requirements may restrict the monitoring area to a lesser amount
** Check local codes for the required transport times determined by the tube lengths
*** Subject to agency Testing

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VESDA Model Comparison Chart

Doc. Ref. Number: 18327

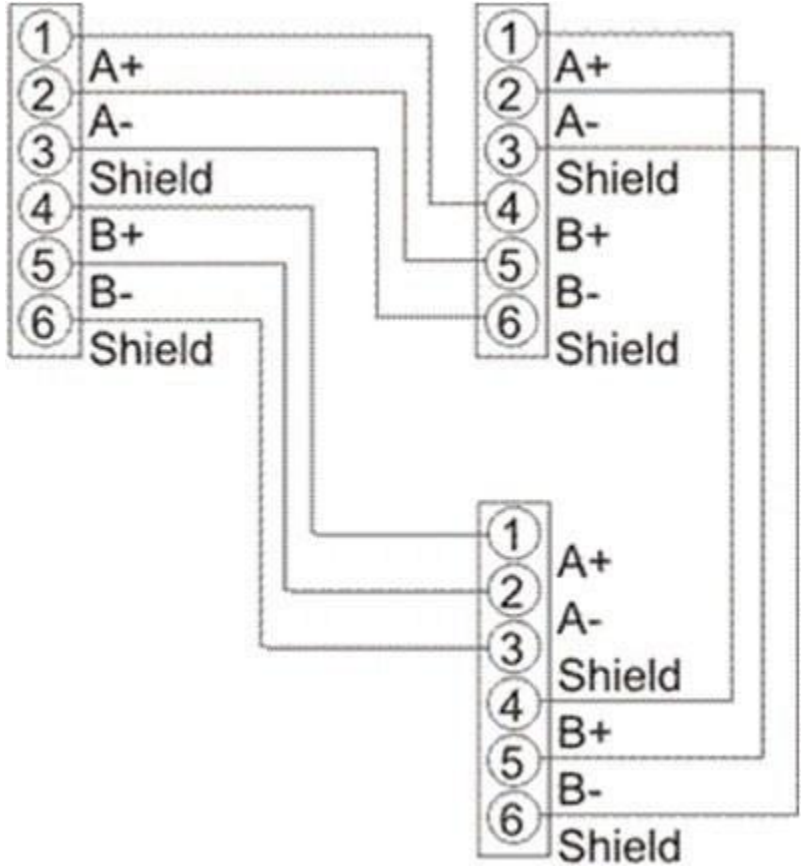
FEATURES	VEU	VEP		VES	VEA	VLF 250/500	Industrial VESDA VLI
		VEP 1-pipe	VEP 4-pipe				
Total Number of Alarm Thresholds	8 (Day/Night)	8 (Day/Night)		32 (Day/Night)	8 (Day/Night)	8 (Day/Night)	8 (Day/Night)
Relay Outputs	7	7		12	7 (Expandable to 47)	3 (Expandable to 6)	5
On-board Memory (Max. Events)	20,000	20,000		20,000	20,000	18,000	18,000
AutoLearn™ (Smoke/Flow)	AutoLearn Smoke™ AutoLearn Flow™	AutoLearn Smoke™ AutoLearn Flow™		AutoLearn Smoke™ AutoLearn Flow™	No	AutoLearn Smoke™ AutoLearn Flow™	AutoLearn Smoke™ AutoLearn Flow™
Bar Graph/Indicator LED	LEDs or 3.5" Color Touch Screen	LEDs	LEDs or 3.5" Color Touch Screen	LEDs or 3.5" Color Touch Screen	LEDs or 3.5" Color Touch Screen	Local (7 on-board LEDs 10 Segment Circular Display) Remote display when fitted with VESDAnet card	Local (5 on-board LEDs) Remote display for VLI-885
Programming Tools - On-board Programming module - Handheld Programmer - PC Software (VSC, VSM)	Programmed via USB/ Ethernet/WiFi connection to PC using VSC/VSM4	Programmed via USB/Ethernet connection to PC using VSC/VSM4		Programmed via USB/ Ethernet connection to PC using VSC/VSM4	Programmed via USB/ Ethernet/WiFi connection to PC using VSC/VSM4	Programmed via RS232 direct connection to PC using VSC™ or Programmer when VN card is fitted	Local USB configuration port Connection to PC using VSC/VSM4 Programmer for VLI-885
StaX Expandability	Yes	Yes		Yes	Yes	No	No
Worldwide Certificates	UL, ULC, FDA, VdS (EN54-20), CE, CSFM, FM, AFNOR, VNIIPO, ActivFire (ISO 7240-20), BOMBA, RCM CCCF	UL, ULC, FDA, VdS (EN54-20), CE, CSFM, FM, AFNOR, VNIIPO, ActivFire (ISO 7240-20), BOMBA, RCM, CCCF		UL, ULC, FDA, VdS (EN54-20), CE, CSFM, ActivFire (ISO 7240-20), BOMBA, RCM	UL, ULC, FDA, VdS (EN54-20), CE, CSFM, FM, ActivFire (ISO 7240-20), BOMBA, RCM, CCCF	UL, ULC, FM, LPCB, VdS, CFE, ActivFire, AFNOR, UL268A (in-duct application), VNIIPO, CE, NY-MEA, CSFM, FDA, BOMBA, ONORM, RCM, EN 54-20	UL, ULC, FM, ActivFire, CE, LPCB, VdS, AFNOR, CSFM, FDA, BOMBA, VNIIPO, RCM, NY-MEA, SIL 2 as per IEC 61508, EN 54-20
VESDAnet™							
Max. No. of devices/ detectors per loop	200 / 100	200 / 100		200 / 100	200 / 100	200 / 100 (with VN Card)	200 / 100 (VLI-885)
Max. Distance between Devices	1,300 m (4,265 ft)	1,300 m (4,265 ft)		1,300 m (4,265 ft)	1,300 m (4,265 ft)	1,300 m (4,265 ft) (with VN Card)	1,300 m (4,265 ft) (VLI-885)
Computer-based Management via VSM	Yes	Yes		Yes	Yes	Yes	Yes
Remote Relay Modules - 7 relay version - 12 relay version	VRT-500 N/A	VRT-500 N/A		VRT-E00 VRT-900	VRT-500 N/A	VRT-500 N/A	VRT-500 N/A
Compatible Remote Bargraph Displays - Display, 7 relays - Display, 12 relays - Display, no relays	VRT-200 N/A VRT-600	VRT-200 N/A VRT-600		VRT-400 VRT-800 VRT-700	VRT-200 N/A VRT-600	VRT-V00 N/A VRT-W00 (with VN Card)	VRT-Q00 N/A VRT-T00 (VLI-885)

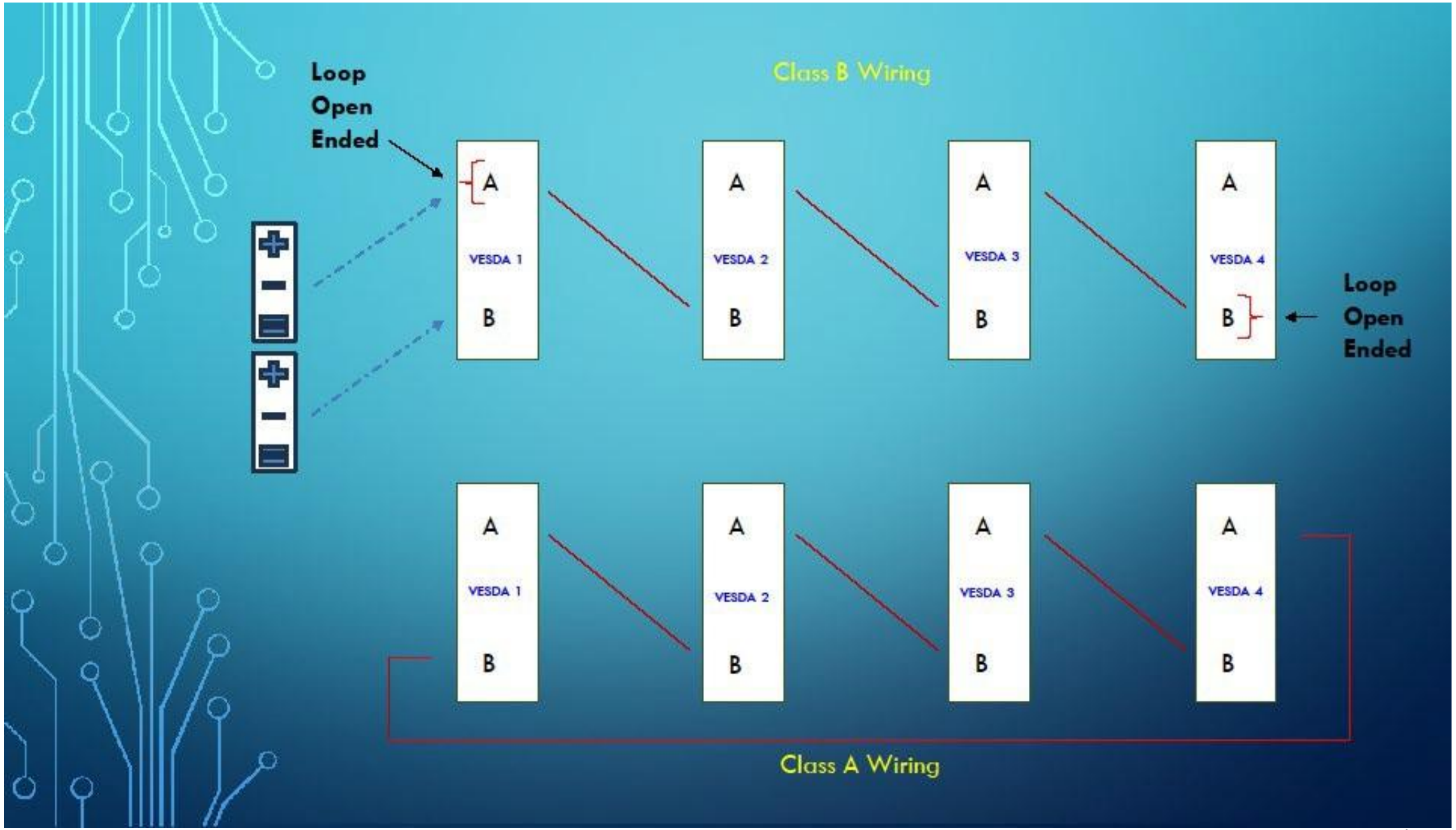
VESDA Networking and Integration

VESDAnet

VesdaNet™ Technical Features

- Max 100 detectors
- **Max 200 devices (only 100 detectors max)**
- RS485 Interface runs over shielded twisted pair wire up to 1.3km (4,000ft) in length (from node to node)
- Use Belden 9841 or equivalent data cable
- Daisy chain loop configuration, half duplex
- Fault tolerant
- **Cabling can run from any port to any port** which polarity of the conductors is important (recommend A-B-A-B on larger networks)
- Open Loop optional, but not recommended

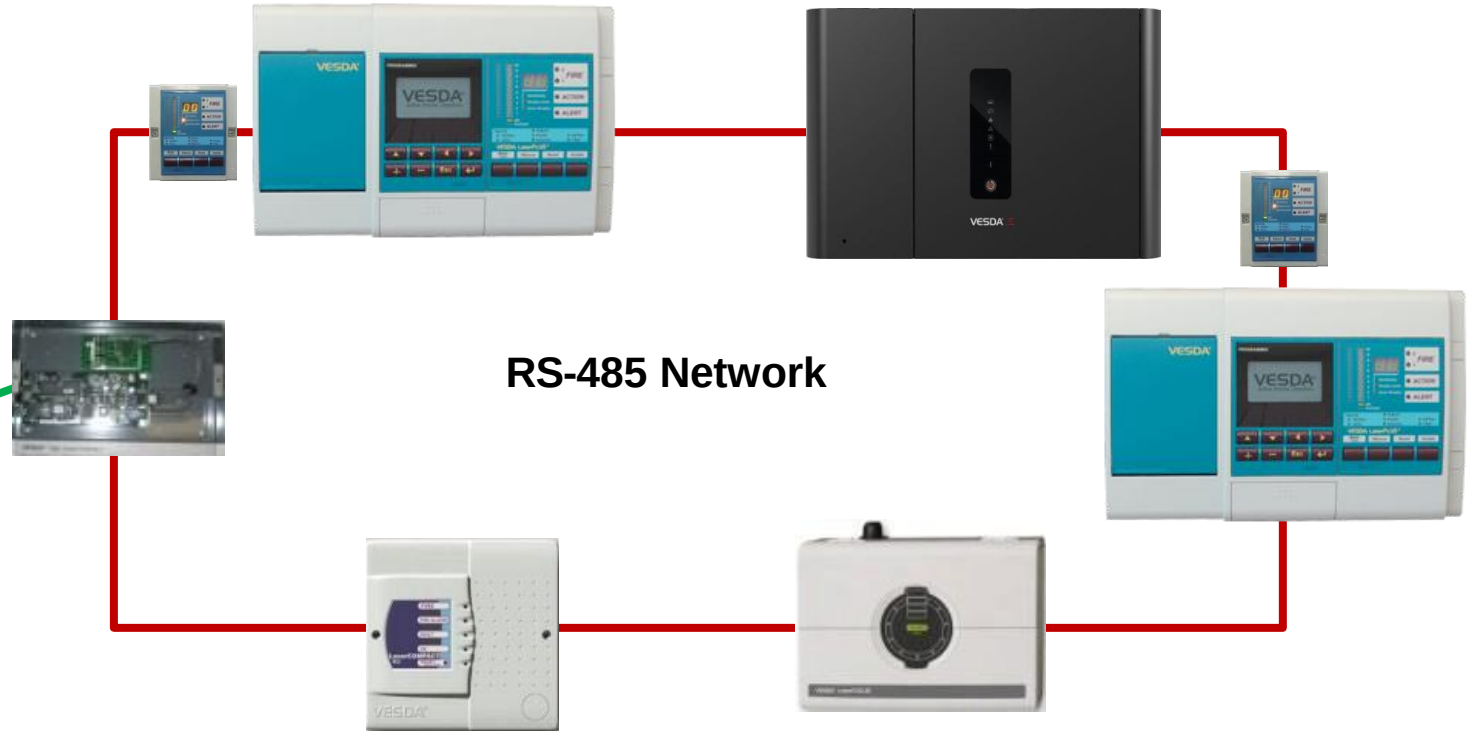



Loop
Open
Ended
Class B Wiring
A
VESDA 1
B
A
VESDA 2
B
A
VESDA 3
B
A
VESDA 4
B
Loop
Open
Ended
A
VESDA 1
B
A
VESDA 2
B
A
VESDA 3
B
A
VESDA 4
B
Class A Wiring

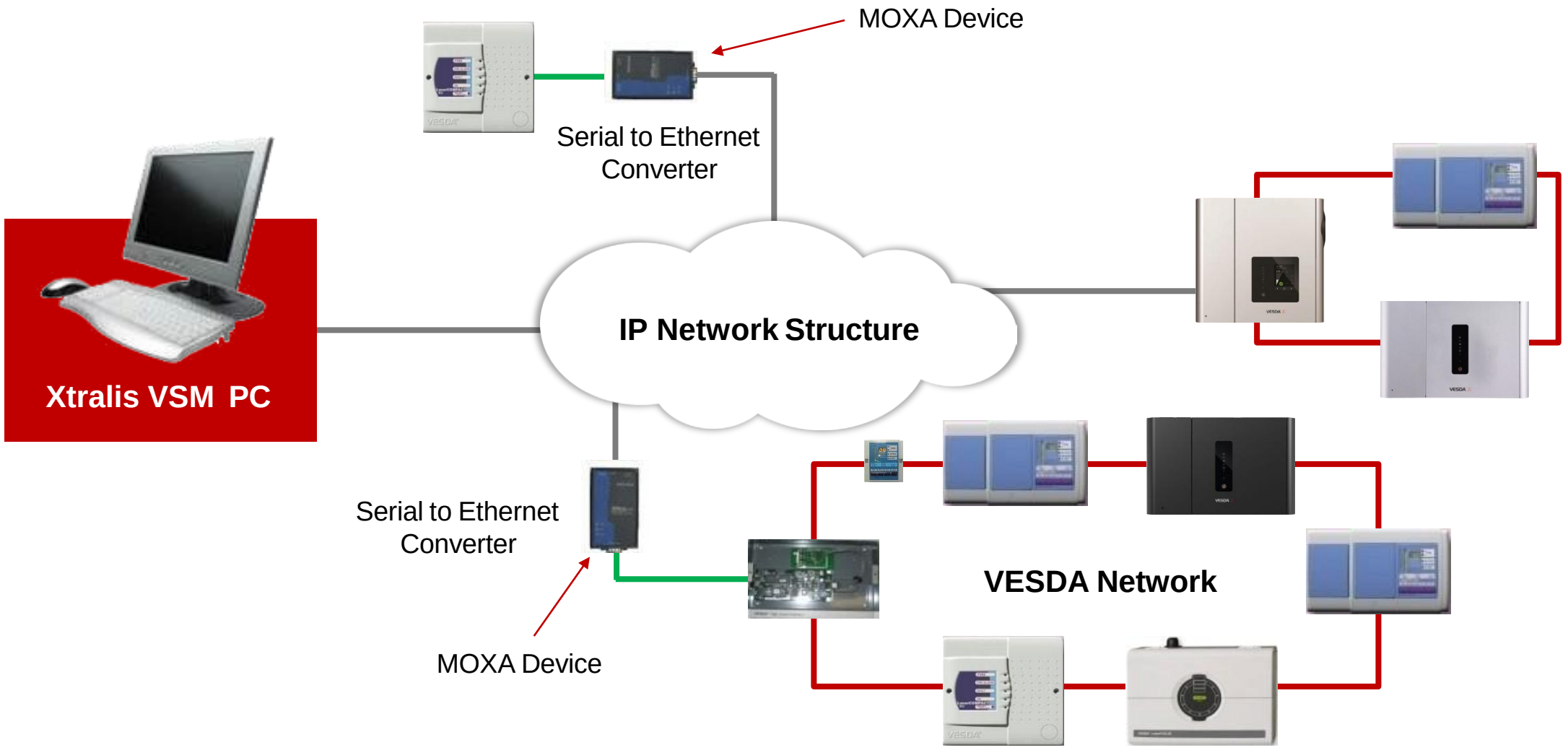
Network with High Level of Interface (HLI)

VHX-1200 (Xtralis VSC, VSM4)

3rd Party Integration:
VHX-1320 (Access Protocol)
VHX-1420 (MODBUS Type 3)



VSM Multiple Connection Options



Summary

VESDA and VESDA-E Product Range

- Difference between VESDA products
- Additional features on VESDA-E
- VESDA Networking and Integration