Very Early Warning Smoke Detection with VESDA-E

Presented by: Steven Joseph, Director Alarm & Detection
Viking Integrated Safety

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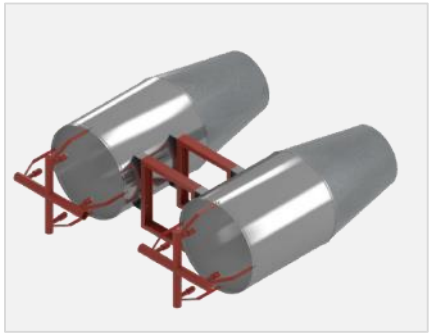


MINIMAX VIKING

For over 110 years, Minimax-Viking has been a premiere global fire protection brand. Operating over 70 fire protection businesses, we employ 9,300+ dedicated professionals selling to the world's best brands & leading businesses.

VIKING® Integrated Safety

Viking Integrated Safety (VIS) offers pre-engineered, end-to-end solutions for targeted applications. We offered expert Design Services that can tailor a system to fit your exact needs, and our solutions cover the entire fire protection landscape, from detection, to alarm & control panels, to special hazards, and suppression. Backed by Viking SupplyNet, VIS will help you get the best fire protection for the toughest challenges.

One Stop Comprehensive Fire Protection Solutions

FIRE ALARM

Conventional
Addressable
Control & Release Panels

ALARM & CONTROL

DETECTION

Industrial Flame
Industrial Heat
Air Sampling
Spot-Type
Gas

FLAME UV/IR	HEAT	AIR SAMPLING	SPOT-TYPE	GAS





EXTINGUISHMENT

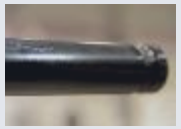
Water Based
Gaseous Suppression
Special Hazards
Portables

WATER BAESD

SPRINKLERS	VALVES	CORROSION MITIGATION







VacTec N2 Blast Fendium

SPECIAL HAZARDS

GAS EXTINGUISHMENT	FOAM	PORTABLES

VSH 1230
VSH 200

Nitrogen
Argon


I/O DEVICES

Audio Visual Alarm
Strobes & Sounders
Manual Stations

NOTIFICATION APPLIANCES	PERIPHERAL DEVICES




CONVERGED SOLUTIONS

Prefabricated Kits
Rackmount Active
Packaged Extinguishment

PRE-ENGINEERED

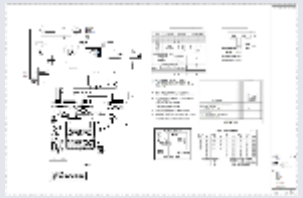
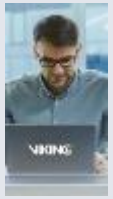


Pre-Engineered Kits OneU TotalPac

SERVICES

Consultation
Design
Training
Fabrication

SPECIFICATION	DESIGN	TRAINING	FABRICATION


DELIVERY

Viking
SupplyNet

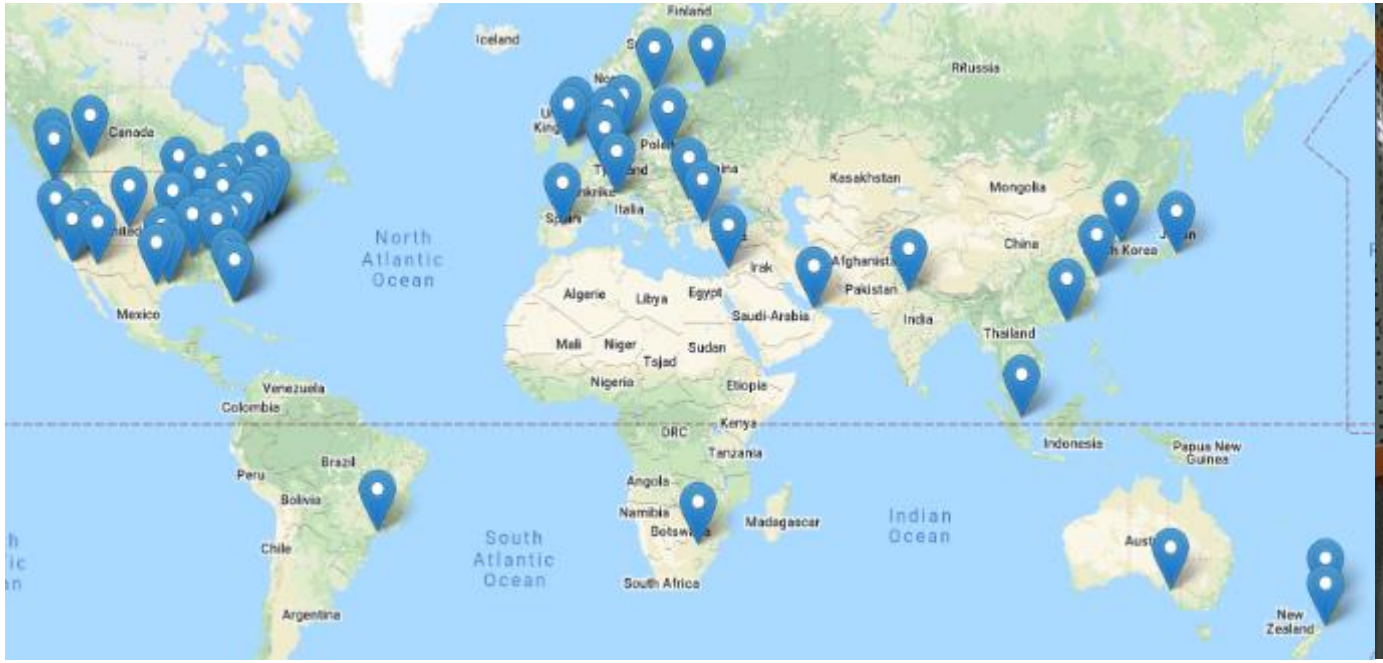
GLOBAL DISTRIBUTION

VIKING Integrated Safety

Everywhere You Need Us

VIKING SupplyNet®

- Over 60 locations Worldwide, 32 locations throughout the US
- Network of 3000+ contracting integration partners
- Integrated computer system allows access to entire network's inventory for prompt, consistent, and accurate product delivery.

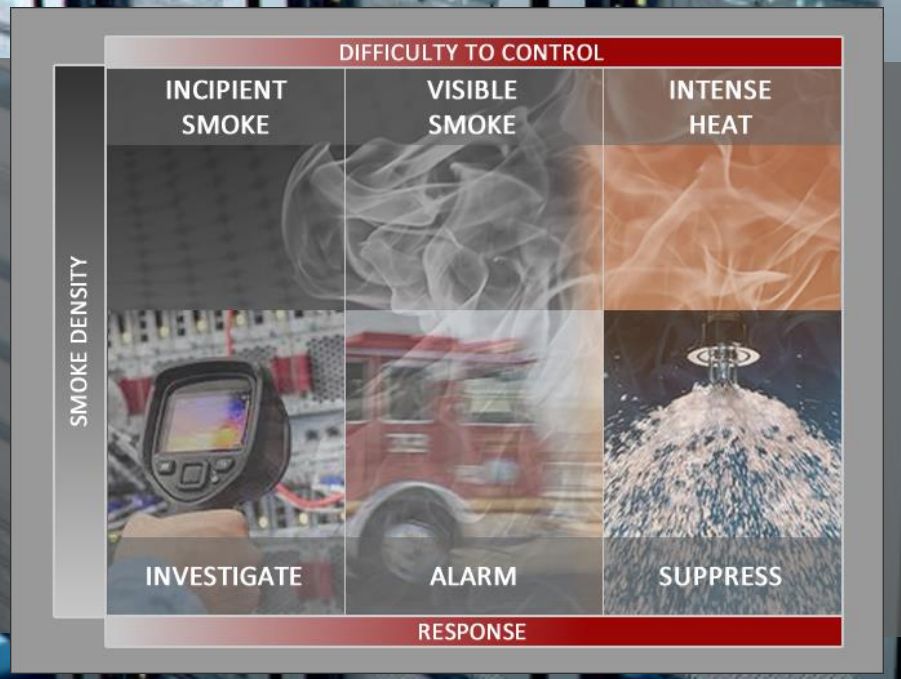


VIKING Integrated Safety

Fire Protection Concept

Concept:

- Detect early
- Control
- Mitigate



Requires:

- Advanced detection technologies
- Expert application
- Appropriate settings
- Supervision and maintenance

First Line of Defense

- Intervention
- Initiation
- Minimization

Technology Options

SMOKE DETECTOR TECHNOLOGIES		
Air Sampling-type	Photoelectric Point-type	Optical Beam-type
		

Selection Criteria

Selection must consider suitability taking into account structural, environmental, not withstanding performance expectations

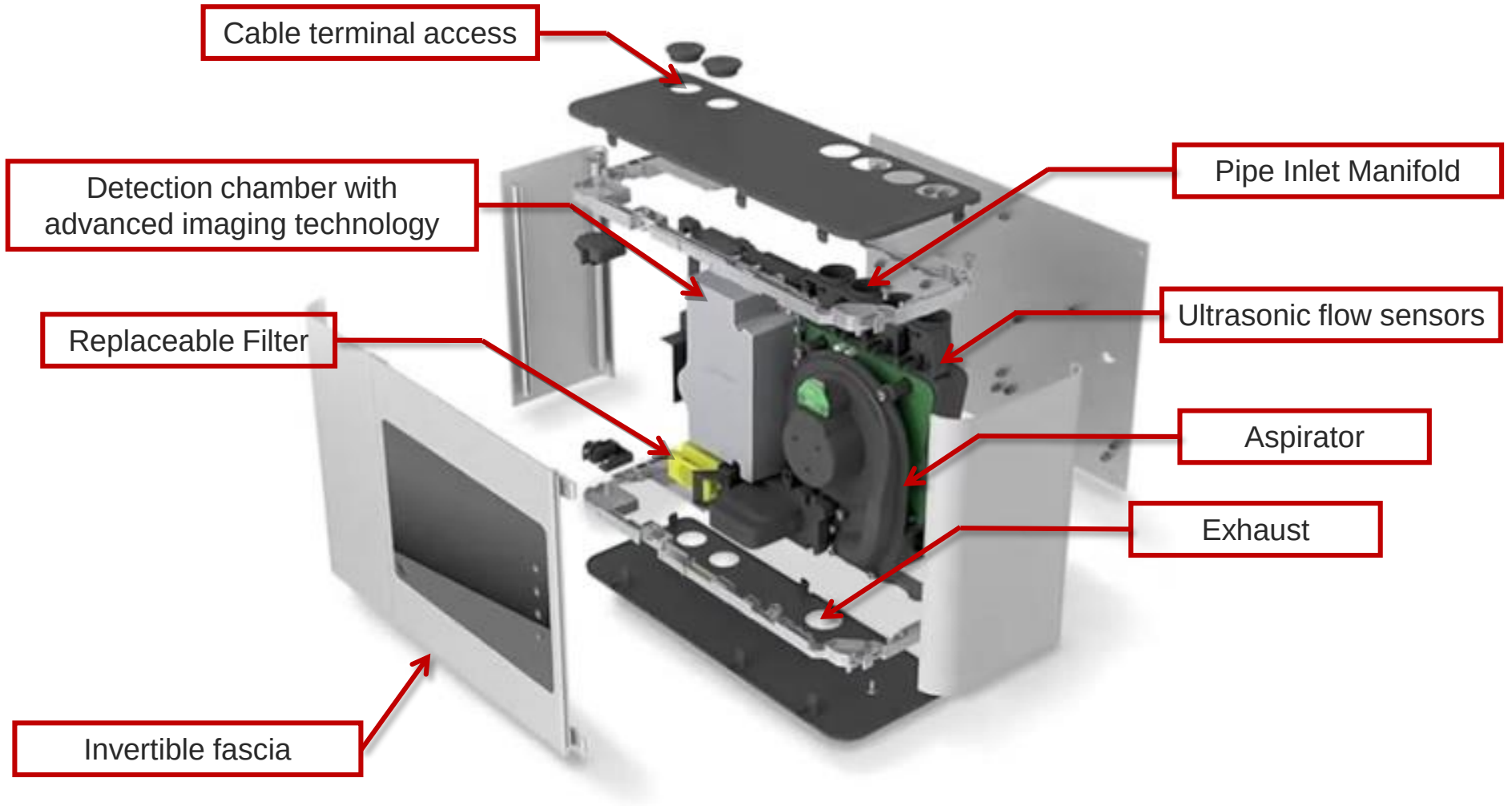
Temperature Listings	Velocity Listings	Sensitivity Capabilities	Placement Limitations	Accessibility
❑	❑	❑	❑	❑

Technology Summary

A system which draws air from an area, via a pipe network, back to a central detector which continuously monitors for traces of smoke

- Active vs Passive performance
- Unobtrusive, non-disruptive accessibility
- Compensates for environmental conditions
- Suitable across a wide range of environments
- Improved visibility for facility diagnostics
- Staged response across fire development stages
- Reliable release of suppression technologies
- Lower total cost of ownership (TCO)

Components


Cable terminal access
Detection chamber with advanced imaging technology
Replaceable Filter
Invertible fascia
Pipe Inlet Manifold
Ultrasonic flow sensors
Aspirator
Exhaust


VESDA
VESDA
VESDA
VESDA
Network

VESDA-E Product Family

VESDA-E VEP
Aspirating Smoke Detector

VESDA-E VES
Aspirating Smoke Detector
(Sector Addressable ASD)

VESDA-E VEU
Aspirating Smoke Detector
(Highest Sensitivity ASD)

VESDA-E VEA
Aspirating Smoke Detector
Pinpoint Addressable ASD

VESDA-E VEP Aspirating Smoke Detector

The VESDA-E VEP series of smoke detectors bring the latest and most advanced detection technology to provide very early warning and the best nuisance alarm rejection to a wide range of applications. Built on the Flair detection technology and years of application experience, VEP detectors achieve consistent performance over their lifetime via absolute calibration. In addition, the VEP delivers a range of revolutionary features that provide user value.

Model Nos. VEP-A00-1P, VEP-A00-P, VEP-A10-P

VESDA-E VES Aspirating Smoke Detector

The VESDA-E VES can identify and monitor smoke density by individual sampling pipe (sector) which allows a single zone to be divided into four separate sectors; for example, distinguishing between separate aisles within a data room. Sector addressability enables the user to respond to a potential fire event quickly by reducing the search area. The VESDA-E VES has four programable alarm thresholds (Alert, Action, Fire 1 and Fire 2) per pipe that allows flexible field application. After the detector identifies the first sector to reach the Alert threshold it continues to sample from all sectors to report real time status per sector via the intuitive touch screen display. Built on the Flair detection technology and years of application experience the VESDA-E VES detector delivers very early warning with the best in class dust rejection throughout its lifetime.

Model Nos. VES-A00-P, VES-A10-P

VESDA-E VEU Aspirating Smoke Detector

The VEU series of aspirating smoke detectors are the premium detector of the VESDA-E range. An Ultra-wide sensitivity range; 15 times greater than VESDA VLP, and provision for more sampling holes provide an increased coverage in high airflow applications by at least 40%. Considerably longer linear pipe runs and extended branched pipe network configurations cater perfectly to applications with higher ceilings providing an increased coverage by up to 80% whilst allowing convenient detector mounting for ease of service and maintenance. A range of revolutionary new features provide unsurpassed detection performance, flexibility, field programmability, connectivity and reduced total cost of ownership.

Model Nos. VEU-A00, VEU-A10

VESDA-E VEA Aspirating Smoke Detector

Managing multiple smoke detectors in large, busy buildings such as hospitals, prisons, or hotels, can be a challenge. Testing and maintaining smoke detectors in such settings, especially those with restricted areas, can be time consuming and disrupt critical operations.

Xtralis VESDA-E VEA Addressable Aspirating Smoke Detection combines assured detection with the unique value of centralized test and maintenance reducing the time, cost and impact of ongoing upkeep.

Model Nos. VEA-040-A00, VEA-040-A10

Product Comparison






Parameter	VESDA Laser Focus	VESDA-E				
	VLF-250 / VLF-500	VEP-1	VEP-4	VEU	VES	VEA
Area Coverage	2690 ft² / 5380 ft²	10,760 sq. ft	21,520 sq. ft	21,520 sq. ft	21,520 sq. ft	21,520 sq. ft
Threshold Range[1]	0.008-6.25 %/ft	0.0016-6.25% obs/ft	0.0016-6.25% obs/ft	0.0003–6.25 %obs/ft	0.0003–6.25 %obs/ft	0.008–6.25 obs/ft
Max No. Holes	12 / 24	30/40/45	40/80/100	80/80/100	40/80/100	40
Linear Pipe[2]	80 ft / 150 ft	328 ft (100 m)	919 ft (280 m)	1312 ft (400 m)	919 ft (280 m)	40 x 328 ft (100 m)
Branched Pipe (Max)	100 ft / 180 ft	427 ft (130 m)	1837 ft (560 m)	2624 ft (800 m)	1837 ft (560 m)	N/A
Pipe Addressability	No	No	No	No	Up to 4	Up to 40
No. Relays	3[3]	7	7	7	12	7 expandable to 47
Connectivity	RS232 Serial	USB, Ethernet, WiFi	USB, Ethernet, WiFi	USB, Ethernet, WiFi	USB, Ethernet, WiFi	USB, Ethernet, WiFi
VESDAnet	Add VIC-010	Yes	Yes	Yes	Yes	Yes
Field Replaceable Chamber	No	Yes	Yes	Yes	Yes	Yes

[1] UL limit 4%
[2] Pipe length depends on number of pipes in use
[3] VIC-020 provides two additional relays (Alert/Fire2)

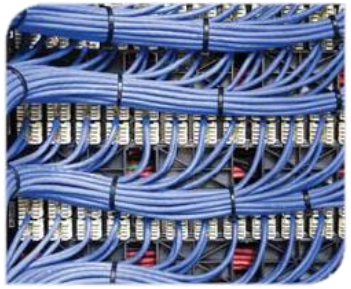
Industry Solutions


Office


Retail


Correctional


Semiconductor


Telecom


Data Center


Health Care


Stadiums


Warehouse


Record Storage


Manufacturing


Transportation

Application Drivers

Business Continuity

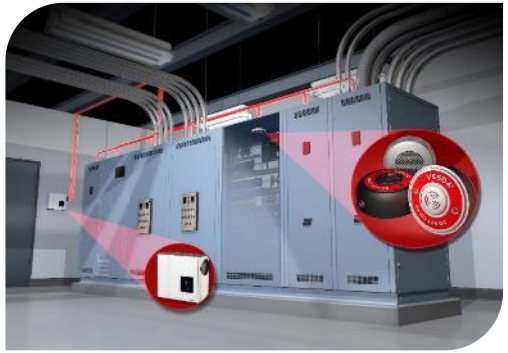
Structural Challenges

Environmental Challenges

Evacuation challenges

Aesthetics

Maintenance Accessibility

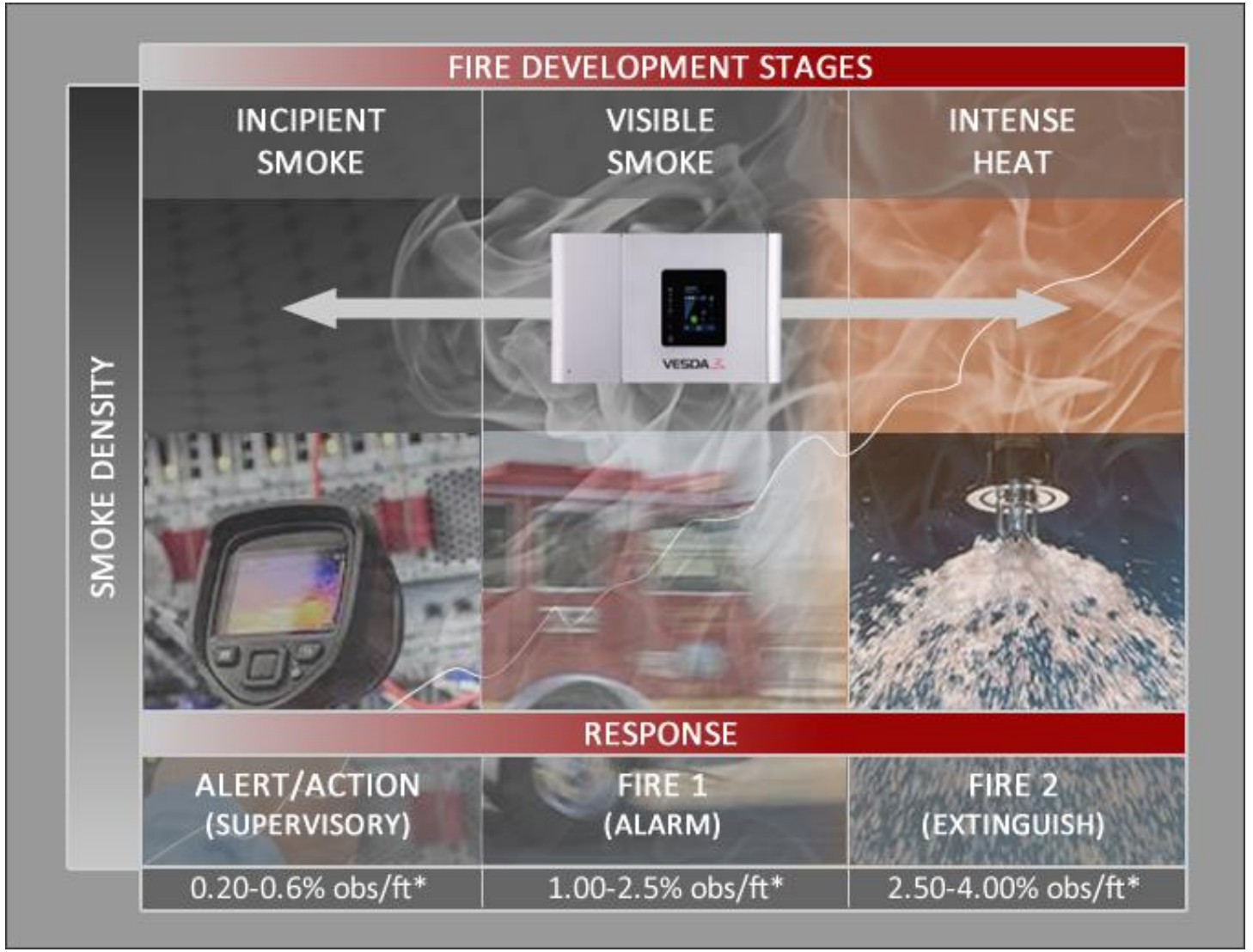


Localized Detection

Suppression Initiation

Staged Response

- VESDA-E sensitivity range suitably performs across fire development stages
- Four programmable alarm thresholds
- Alarm thresholds ideally set to reliably initiate response at the right time



* Sample hole sensitivity

Alert & Action (Supervisory)

- Early indication of a developing condition
- Notify on-site personnel for early intervention
- Notify central monitoring station
- Mitigate consequences

		SYSTEM OUTPUTS																									
		Control Unit Annunciation							Notification					Required Fire Safety Control							Supplementary					
	SYSTEM INPUTS	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	
		Actuate Common Alarm Signal Indicator	Actuate Audible Alarm Signal	Actuate Common Supervisory Signal Indicator	Actuate Audible Supervisory Signal	Actuate Common Trouble Signal Indicator	Actuate Audible Common Trouble Signal	Actuate Alarm Indicator	Actuate Evacuation Signals	Display/Print Change of Status	Transmit Fire Alarm Signal to Supervising Station	Transmit Supervisory Signal to Supervising Station	Transmit Trouble Signal to Supervising Station	Release Magnetically Held Smoke Doors	Recall Elevators to Primary Recall Floor	Actuate Smoke Exhaust	Unlock Exits	Actuate Suppression System Pre-discharge Alarms	Initiate Suppression System Releasing Sequence	Energize Releasing Solenoids	Actuate Graphics System - Display Floor Map	Shutdown Processes	Send Fire Alarm Signal to BMS	Send Fire Alarm Signal to Security	Send Supervisory Signal to Security	
1	VESDA – Alert (0.20% obs/ft)[1]			●	●					●		●									●				●	1
2	VESDA – Action (0.60% obs/ft)[1]			●	●					●		●									●				●	2
3	VESDA – Fire 1 (1.00% obs/ft)[1]	●	●					●	●	●	●			●	●	●	●				●	●	●	●		3
4	VESDA – Fire 2 (2.50% obs/ft)[1]	●	●					●	●	●	●			●	●	●	●	●	●	●	●	●	●	●		4
5	VESDA – Trouble					●	●			●			●								●					5
6	VESDA AC Power Failure					●	●			●			●								●					6
7	VESDA Low Battery					●	●			●			●								●					7
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	P	Q	R	S	T	U	V	W	X	

[1] Sensitivity at each port/sensor

Fire 1 (Alarm)

- Indication of a developed condition that could threaten life safety
- Notify building occupants
- Notify central monitoring station
- Dispatch Fire Department
- Initiate required shutdowns
- Evacuate

		SYSTEM OUTPUTS																									
		Control Unit Annunciation							Notification					Required Fire Safety Control							Supplementary					
		Actuate Common Alarm Signal Indicator	Actuate Audible Alarm Signal	Actuate Common Supervisory Signal Indicator	Actuate Audible Supervisory Signal	Actuate Common Trouble Signal Indicator	Actuate Audible Common Trouble Signal	Actuate Alarm Indicator	Actuate Evacuation Signals	Display/Print Change of Status	Transmit Fire Alarm Signal to Supervising Station	Transmit Supervisory Signal to Supervising Station	Transmit Trouble Signal to Supervising Station	Release Magnetically Held Smoke Doors	Recall Elevators to Primary Recall Floor	Actuate Smoke Exhaust	Unlock Exits	Actuate Suppression System Pre-discharge Alarms	Initiate Suppression System Releasing Sequence	Energize Releasing Solenoids	Actuate Graphics System - Display Floor Map	Shutdown Processes	Send Fire Alarm Signal to BMS	Send Fire Alarm Signal to Security	Send Supervisory Signal to Security	
SYSTEM INPUTS		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	
1	VESDA – Alert (0.20% obs/ft)[1]			●	●					●		●									●				●	**1**
2	VESDA – Action (0.60% obs/ft)[1]			●	●					●		●									●				●	**2**
3	VESDA – Fire 1 (1.00% obs/ft)[1]	●	●					●	●	●	●			●	●	●	●				●	●	●	●		**3**
4	VESDA – Fire 2 (2.50% obs/ft)[1]	●	●					●	●	●	●			●	●	●	●	●	●	●	●	●	●	●		**4**
5	VESDA – Trouble					●	●			●			●								●					**5**
6	VESDA AC Power Failure					●	●			●			●								●					**6**
7	VESDA Low Battery					●	●			●			●								●					**7**
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**P**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	

[1] Sensitivity at each port/sensor

Fire 2 (Alarm & Extinguish)

- Indication of a developed condition that could threaten life safety
- Notify building occupants
- Notify central monitoring station
- Dispatch Fire Department
- Initiate required shutdowns
- Evacuate

SYSTEM OUTPUTS

SYSTEM INPUTS		Control Unit Annunciation							Notification					Required Fire Safety Control							Supplementary					
		A: Actuate Common Alarm Signal Indicator	B: Actuate Audible Alarm Signal	C: Actuate Common Supervisory Signal Indicator	D: Actuate Audible Supervisory Signal	E: Actuate Common Trouble Signal Indicator	F: Actuate Audible Common Trouble Signal	G: Actuate Alarm Indicator	H: Actuate Evacuation Signals	I: Display/Print Change of Status	J: Transmit Fire Alarm Signal to Supervising Station	K: Transmit Supervisory Signal to Supervising Station	L: Transmit Trouble Signal to Supervising Station	M: Release Magnetically Held Smoke Doors	N: Recall Elevators to Primary Recall Floor	O: Actuate Smoke Exhaust	P: Unlock Exits	Q: Actuate Suppression System Pre-discharge Alarms	R: Initiate Suppression System Releasing Sequence	S: Energize Releasing Solenoids	T: Actuate Graphics System - Display Floor Map	U: Shutdown Processes	V: Send Fire Alarm Signal to BMS	W: Send Fire Alarm Signal to Security	X: Send Supervisory Signal to Security	
1	VESDA – Alert (0.20% obs/ft)[1]			●	●					●		●									●				●	1
2	VESDA – Action (0.60% obs/ft)[1]			●	●					●		●									●				●	2
3	VESDA – Fire 1 (1.00% obs/ft)[1]	●	●					●	●	●	●			●	●	●	●				●	●	●	●		3
4	VESDA – Fire 2 (2.50% obs/ft)[1]	●	●					●	●	●	●			●	●	●	●	●	●	●	●	●	●	●		4
5	VESDA – Trouble					●	●			●			●								●					5
6	VESDA AC Power Failure					●	●			●			●								●					6
7	VESDA Low Battery					●	●			●			●								●					7
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	P	Q	R	S	T	U	V	W	X	

[1] Sensitivity at each port/sensor

Fire 2 (Alarm & Extinguish)

- Indication of a developed condition that could threaten life safety
- Notify building occupants
- Notify central monitoring station
- Dispatch Fire Department
- Initiate required shutdowns
- Evacuate
- Initiate suppression measures

		SYSTEM OUTPUTS																									
		Control Unit Annunciation							Notification					Required Fire Safety Control							Supplementary					
		Actuate Common Alarm Signal Indicator	Actuate Audible Alarm Signal	Actuate Common Supervisory Signal Indicator	Actuate Audible Supervisory Signal	Actuate Common Trouble Signal Indicator	Actuate Audible Common Trouble Signal	Actuate Alarm Indicator	Actuate Evacuation Signals	Display/Print Change of Status	Transmit Fire Alarm Signal to Supervising Station	Transmit Supervisory Signal to Supervising Station	Transmit Trouble Signal to Supervising Station	Release Magnetically Held Smoke Doors	Recall Elevators to Primary Recall Floor	Actuate Smoke Exhaust	Unlock Exits	Actuate Suppression System Pre-discharge Alarms	Initiate Suppression System Releasing Sequence	Energize Releasing Solenoids	Actuate Graphics System - Display Floor Map	Shutdown Processes	Send Fire Alarm Signal to BMS	Send Fire Alarm Signal to Security	Send Supervisory Signal to Security	
SYSTEM INPUTS		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	
1	VESDA – Alert (0.20% obs/ft)[1]			●	●					●		●									●				●	**1**
2	VESDA – Action (0.60% obs/ft)[1]			●	●					●		●									●				●	**2**
3	VESDA – Fire 1 (1.00% obs/ft)[1]	●	●					●	●	●	●			●	●	●	●				●	●	●	●		**3**
4	VESDA – Fire 2 (2.50% obs/ft)[1]	●	●					●	●	●	●			●	●	●	●	●	●	●	●	●	●	●		**4**
5	VESDA – Trouble					●	●			●			●								●					**5**
6	VESDA AC Power Failure					●	●			●			●								●					**6**
7	VESDA Low Battery					●	●			●			●								●					**7**
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**P**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	

[1] Sensitivity at each port/sensor

Trouble & Faults

- Notify on-site personnel of conditions critical to system performance for early intervention
- Notify central monitoring station

SYSTEM OUTPUTS

		Control Unit Annunciation							Notification					Required Fire Safety Control							Supplementary					
		Actuate Common Alarm Signal Indicator	Actuate Audible Alarm Signal	Actuate Common Supervisory Signal Indicator	Actuate Audible Supervisory Signal	Actuate Common Trouble Signal Indicator	Actuate Audible Common Trouble Signal	Actuate Alarm Indicator	Actuate Evacuation Signals	Display/Print Change of Status	Transmit Fire Alarm Signal to Supervising Station	Transmit Supervisory Signal to Supervising Station	Transmit Trouble Signal to Supervising Station	Release Magnetically Held Smoke Doors	Recall Elevators to Primary Recall Floor	Actuate Smoke Exhaust	Unlock Exits	Actuate Suppression System Pre-discharge Alarms	Initiate Suppression System Releasing Sequence	Energize Releasing Solenoids	Actuate Graphics System - Display Floor Map	Shutdown Processes	Send Fire Alarm Signal to BMS	Send Fire Alarm Signal to Security	Send Supervisory Signal to Security	
SYSTEM INPUTS		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	
1	VESDA – Alert (0.20% obs/ft)[1]			●	●					●		●									●				●	**1**
2	VESDA – Action (0.60% obs/ft)[1]			●	●					●		●									●				●	**2**
3	VESDA – Fire 1 (1.00% obs/ft)[1]	●	●					●	●	●	●			●	●	●	●				●	●	●	●		**3**
4	VESDA – Fire 2 (2.50% obs/ft)[1]	●	●					●	●	●	●			●	●	●	●	●	●	●	●	●	●	●		**4**
5	VESDA – Trouble					●	●			●			●								●					**5**
6	VESDA AC Power Failure					●	●			●			●								●					**6**
7	VESDA Low Battery					●	●			●			●								●					**7**
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	

[1] Sensitivity at each port/sensor

Release Initiation Best Practices

VESDA-E is often used to provide reliable suppression release initiation for challenging environments. The following are best practices to consider when using VESDA-E detectors for this function:

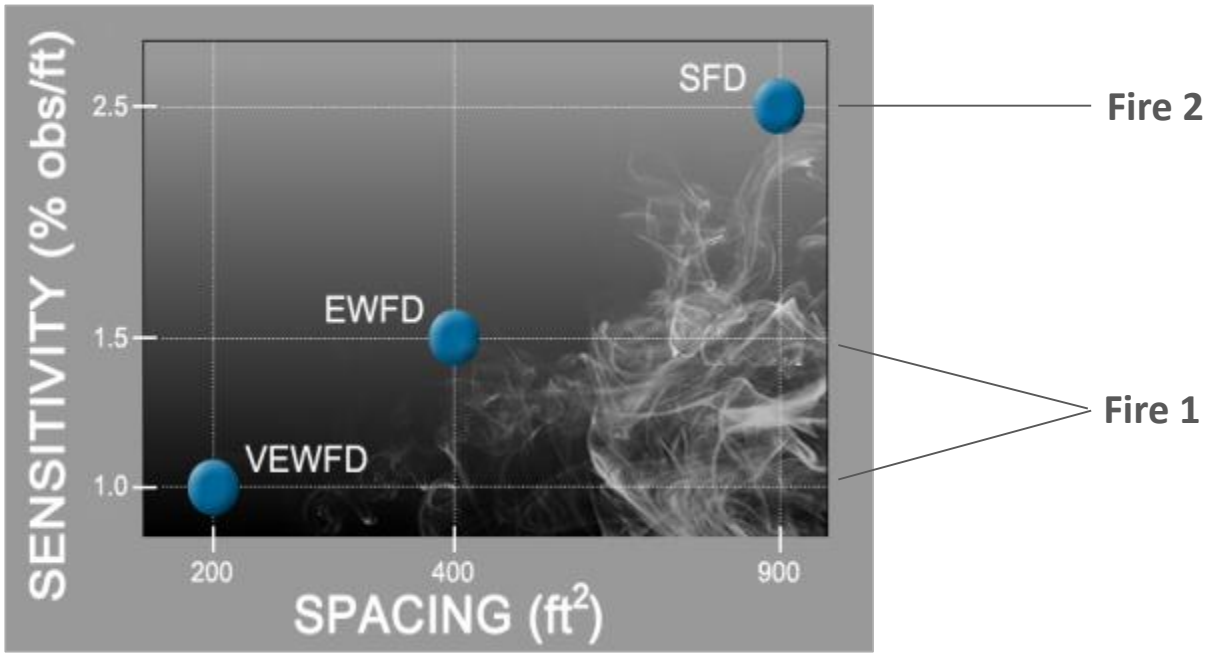
- Never release off very early warning thresholds
- Typically use the Fire 2 alarm threshold for suppression initiation
- Consider Standard Fire Detection threshold settings for release initiation (2-4% obs/ft)*
- Consider cross zoning two or more detectors when releasing clean agent, deluge or single interlocked preaction systems
- Where used, consider cross zoning pipe sectors of addressable ASD for double interlocked preaction systems
- Consider ANDing Fire 1 and Fire 2 relays for confidence when initiating release
- Consider jurisdictional or insurer restrictions with respect to cross zoning

* Sensitivity at each sample hole

Sensitivity Classifications

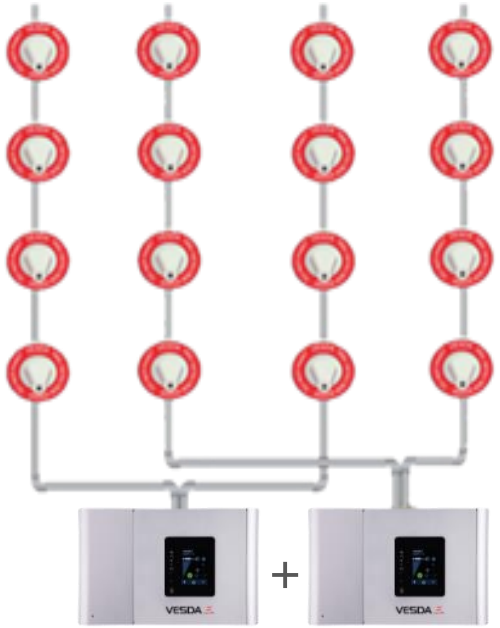
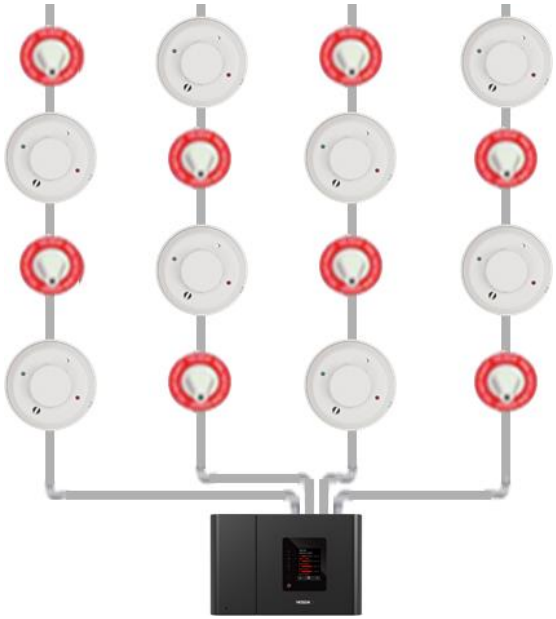
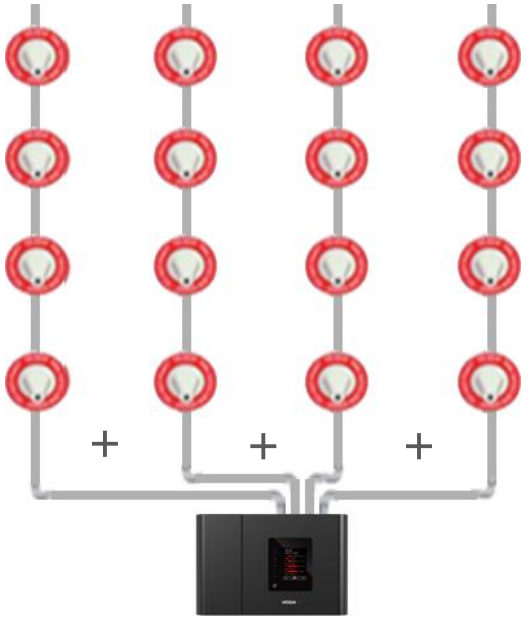
Releasing extinguishment too early or too late can be detrimental to extinguishment performance or result in unnecessary expense and disruption

- Consider initiating release on SFD sensitivity levels



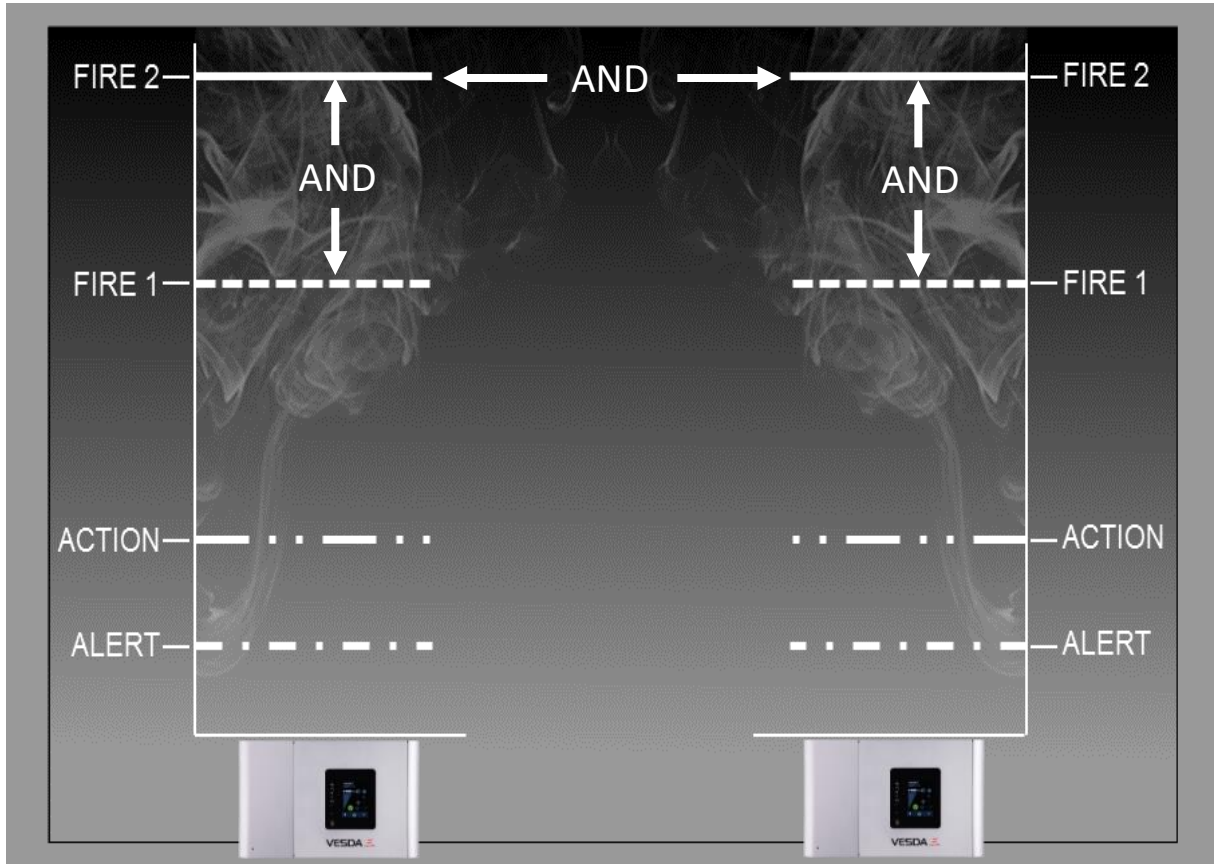
[1] Sensitivity at each port/sensor

Possible Cross Zone Configurations

Clean Agent, Deluge or Single Interlocked Preaction Systems		Double Interlocked Preaction Systems
		
Two or more detector zones in alarm	Two or more detector types in alarm	Two or more pipe sectors in alarm (VES)

ANDing Alarm Thresholds

- Avoids single relay point of failure



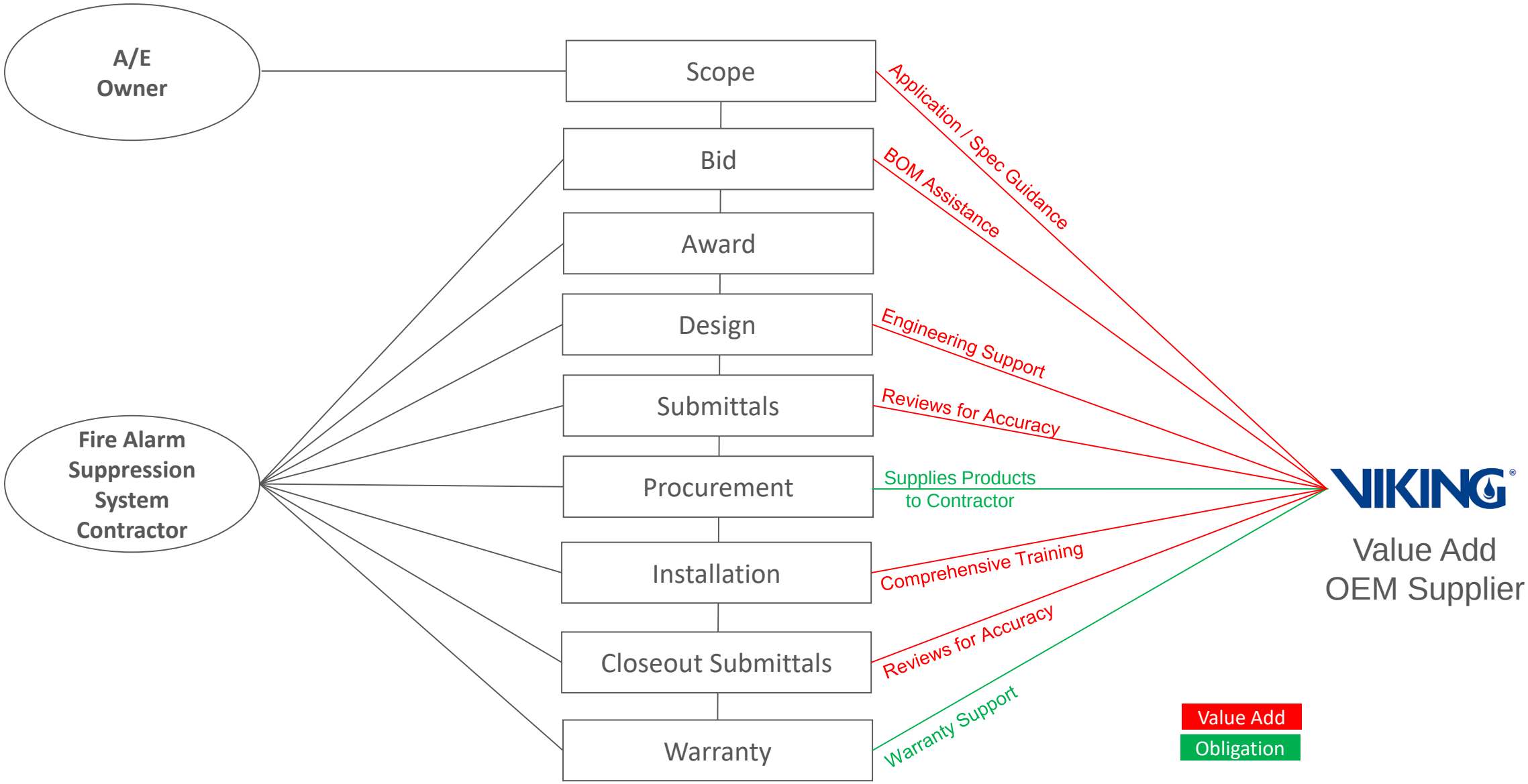
Value Added Partner

- OEM supplier offering leading brand products
- One-stop supplier
- 60 company owned distribution centers worldwide
- Highly experienced technical staff
- No charge for scope consultation
- No charge engineering support
- No charge for submittal reviews
- No charge for closeout submittal review
- World class training support
- Improves time
- Lowers cost
- Lowers risk

OEM Product Portfolio

Viking SupplyNet has longtime partnerships with a variety of 3rd party manufacturers allowing us to offer the widest product portfolio, excellent customer service and unparalleled application expertise.

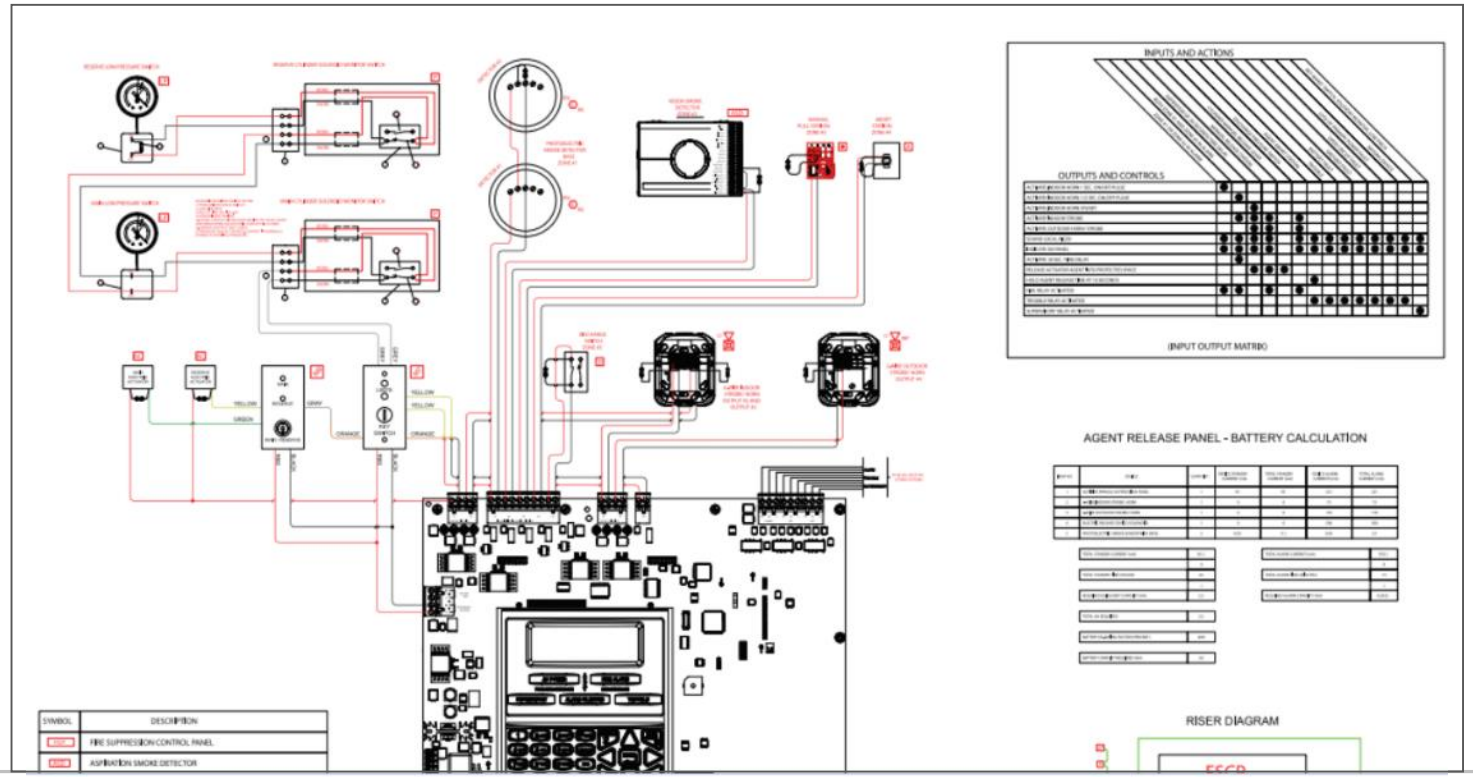
Viking Integrated Safety - Value Add Partner



Viking Global Engineering Support Service Center (GESSC)

GESSC provides unparalleled engineering support services, assisting consultants, architects, engineers and contractors with system design and implementation. Consider GESSC for your next VESDA project. Complimentary services include:

- Application consultation
- BOM preparation
- ASPIRE calculations
- Battery calculations
- Isometric and plan view drawings
- Point to Point wiring diagrams
- Cause & Effect matrix
- Product submittals
- Supports AutoCAD & Revit formats
- Product training



Summary

VESDA-E and Viking Integrated Safety

- Predictable detection performance
- Suitable across a wide range of industries and applications
- Reliably initiates suppression
- Lower TCO
- Convenient, competitively priced accessibility through Viking SupplyNet
- Viking Integrated Safety value added support services reduces risk, time & cost

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