VESDA VLF for Rail Applications

VLF-250

The fundamental nature of train operation means that there is an inherent risk of fire. High power, high inertia systems, “as built” and introduced fuel loads combine to create fire risks. Trains are an evacuation challenge, often containing large numbers of occupants in a moving platform, complicating egress. High airflows and contaminants further challenge the longevity and performance of smoke detection systems in rolling stock. Robust and reliable operation and the earliest possible detection of smoke is key to the prevention of service interruption, threats to life safety, and loss of assets and business reputation.

The VESDA VLF-250 is a very early warning smoke detector designed to protect small, business-critical environments of less than 250 m^2 (2690 sq. ft.). It can detect smoke reliably at the very early stages of fire development and initiate appropriate response measures to prevent losses, damage and ensure business continuity. By providing reliable detection, and simple and cost-effective maintenance, VESDA VLF-250 provides optimal protection of railcars.

The detector works by continually drawing air into sampling holes in a pipe network. The air is filtered and passed into a detection chamber where light scattering technology detects the presence of very small amounts of smoke. Detector status information is communicated on the detector display and via relays or optional interface cards.

Out-of-the-box operation

The VLF can be installed and commissioned out-of-the-box without the need for a special interface or software programming tools.

In operation, the unique Smoke Dial™ display provides the user with an instant understanding of a smoke event, even from a distance. Should a fault occur, the user simply opens the field service door and activates the Instant Fault Finder feature to determine the specific fault condition. This information can then be passed onto their fire service company, ensuring that service technicians arrive onsite fully prepared.

Ultrasonic Flow Sensing

The patent-pending Ultrasonic Flow Sensing used in the VLF provides a direct reading of the sampling pipe flow rate. The system is immune to air temperature and pressure changes and is unaffected by contamination. The VLF is the first air sampling smoke detector to use ultrasonic flow sensing.

Features

- Out-of-the-Box Installation and Commissioning
- Ultrasonic Airflow Sensing
- Laser-Based Absolute Smoke Detection
- Pre-engineered pipe network designs
- Programmable Alarm Thresholds
- Clean air barrier optics protection
- Instant Recognition Display
- Instant Fault Finder™
- AutoLearn™ Smoke
- AutoLearn™ Flow
- Field Service Access Door
- Multiple Event Logging in separate logs
- Event log – up to 18000 events
- Offline/online configuration capability
- Up to 250 m^2 (2690 sq. ft.) coverage*

Listings/Approvals

- UL 94V0
- NF F16-101
- DIN 5510-2
- EN 50155
- SIL 2 as per IEC 61508 (2010)
- EN 54-20
  - Class A (12 holes / 0.12% obs/m)
  - Class B (12 holes / 0.35% obs/m)
  - Class C (12 holes / 0.80% obs/m)

Classification of any configuration is determined using ASPIRE2.

Regional approvals listings and regulatory compliance vary between VESDA product models. Refer to www.xtralis.com for the latest product approvals matrix.

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Specifications

Input Power

Voltage:	24V DC Nominal (18-30 V DC)
Current @ 24 VDC:	220 mA nominal, 295 mA in alarm *Note: a DC/DC power converter shall be used to power-up the unit from the railcar power output.* *PSU filter (VSP-725) must be installed on each VLF-250 detector terminal block.*
Dimensions (W x H x D)	256 mm x 183 mm x 92 mm ($10^{1}/_{16}$ in x $7^{1}/_{5}$ in x $3^{2}/_{3}$ in)
Weight	Approx. 2 kg (4.4 lbs)
IP Rating	IP30
Mounting	Upright, inverted or horizontal

Operating Conditions

Ambient:	Temperature Class T3 as per EN 50155
Tested to:	-25°C to 70°C (-13F to 158°F)
Sampled Air:	-20°C to 60°C (-4°F to 140°F)
Storage:	-40°C
Humidity:	5% to 95% RH, non-condensing

Sampling Network

Maximum pipe lengths:	1 x 25 m (80 ft) (Max. 12 holes) 2 x 15 m (50 ft) per branch (Max. 6 holes per branch)
Sampling Hole Options:	Pre-Engineered Option or Maximum Pipe length in accordance with Pipe Modelling Design Tool (ASPIRE2™)

Air Inlet Pipe
Accepts both metric and American standard pipe sizes
Metric: 25 mm (1.05 in.) American Pipe: IPS 21 mm (¾ in.). Flexible 21.6 mm (0.85 in.)

Area Coverage
Up to 250 m^2 (2690 sq. ft.) depending on local codes and standards

Relay Outputs
3 changeover relays (Fire 1, Action, Fault), Contacts rated 2A @ 30 VDC (max). NO/NC Contacts

Cable Access
3 x 25 mm (1.05 in.) cable entries (1 rear entry, 2 top entry)

Cable Termination
Screw Terminals 0.2-2.5 mm^2 (30-12 AWG)

Interfaces
Shown in Terminal Block Connections diagram, to right, plus an RS232 Programming Port. General Purpose Input (GPI) interface offers: Reset, Disable, Standby, Alarm set 1, Alarm set 2 and External Input functions.

Alarm Threshold Setting Range

Alert, Action	0.025 - 2.00% obs/m (0.008 - 0.625% obs/ft)
Fire 1, Fire 2	0.025 - 20.00% obs/m (0.008 - 6.25% obs/ft)
Individual Alarm Delays	0 – 60 seconds
Two Alarm Threshold Settings	Either time or GPI based

Display

• 4 Alarm State Indicators	• Fault and Disabled Indicators
• Smoke Level Indicator	• Instant Fault Finder
• Reset, Disable and Test Controls	• Smoke and Flow AutoLearn Controls

Event Log
Up to 18000 events, time and date stamped in separate, non-volatile, logs for:
Smoke Level, Flow Level, Detector Status and Faults

AutoLearn Smoke & Flow
• Automatically set acceptable alarm thresholds for both smoke and flow levels
• Minimum 15 minutes, maximum 15 days (default 14 days)
• During AutoLearn thresholds are NOT changed from pre-set values

Warranty Period
2 years

Ordering Information:

VLF-250-00	VESDA VLF. European language set. English display labels
VLF-250-01	VESDA VLF. European language set. International display labels
VLF-250-02	VESDA VLF. English + Asian language set. International display labels
VLF-250-04	VESDA VLF. English + Russian language set. International display labels
VLF-250-05	VESDA VLF. English + Eastern Euro language set. International display labels
VSP-725	VESDA PSU Filter
VSP-850-R (Red)	In-line Filter
VSP-850-M (Metal)	In-line Filter
VSP-855-20	In-line Filter Elements (pack of 20)
VIC-010	VESDAnet Interface Card
VIC-020	Multifunction Control Card (MCC)
VIC-030	Multifunction Control Card (MCC) with Monitored Powered Output (MPO)
VSP-005	Filter Cartridge, VSP-722 Aspirator for VESDA VLF-250

Display:

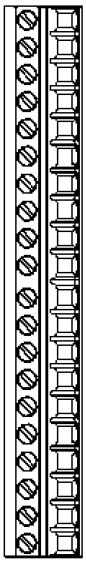
The display provided to the user includes a Smoke Dial™ and alarm and status indicators.

When the field service access door is open, the user has access to the RESET, DISABLE, Fire Test, AutoLearn and Instant Fault Finder functions.
When the Instant Fault Finder function is activated, the Smoke Dial™ converts to a fault indicator, with the dial segment numbers corresponding to the faults listed below.

Legend of fault indicators:

1 Filter	6 External Device/PSU
2 Aspirator	7 Interface card
3 High flow	8 Field wiring
4 Low flow	9 AutoLearn Fail
5 n/a	10 Detector failure

Terminal Block Connections



1	GPI	
2	GPI	
3	Display TX	
4	Display RX	
5	Display Common Ground	
6	Display Power -	
7	Display Power +	
8	Power Return 0 VDC	From power supply unit
9	Power In 24 VDC	
10	Power Return 0 VDC	To next detector (if more than 1 detector per Power Supply Unit)
11	Power Out 24 VDC	
12	NC	
13	Common	Fault relay
14	NO	
15	NC	
16	Common	Action relay
17	NO	
18	NC	
19	Common	Fire 1 relay
20	NO	

Approvals Compliance

Please refer to the Product Guide for details regarding compliant design, installation and commissioning.

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