VESDA VLF-250 and VLF-500 Installation Instructions

These installation instructions provide essential information for installing VESDA VLF Aspirating Smoke Detectors in accordance with the system design. Additional installation and product documentation is listed below in the Reference Documents section.

System Components

The detector is shipped with the following components:

- 1 VESDA VLF detector with fitted exhaust deflector
- 1 mounting bracket
- 1 End of Line resistor for the monitored GPI
- 12 M4 x 20 mm locking screws
- 1 installation instruction sheet
- 1 product guide

Prerequisites

- A completed system design documents.
- A 24V DC Power Supply, compliant with local codes and standards.
- Screws and inserts that are appropriate for the mounting surface.
- 9 Pin DB9 PC COM Serial extension cable (male) for initial configuration of the detector.
- Labels as specified in the system design.
- Cable glands that are compliant with the IP rating of the detector.
- Conduit, as specified in the system design.
- 0.2 mm² to 2.5 mm² (24 - 14 AWG) wiring for relays.
- A PC or laptop installed with Xtralis VSC for initial configuration.
- Standard connection instructions for where the detectors are to be added to a corporate network.

Standards Compliance

UL

For open area protection the fire alarm threshold (signal) that initiates an evacuation procedure via the Fire Alarm Panel must not be set less sensitive than 0.625%/ft. The detector can send this signal via the Fire Alarm Panel Output signal or the Pre-alarm output signal.

Through validation testing, Underwriters Laboratories Inc. has verified that VESDA ECO gas detectors, when installed within the sample pipe network, present no significant effects on the smoke detection performance of VESDA. The use of the ASPIRE calculation software is required to verify system design performance with all devices included in the design.

European Installations

The product must use a power supply conforming to EN54; Part 4.

The product is compliant with EN 54-20 sensitivity requirements provided the following conditions are met:

- For a Class A detector, hole sensitivity must be better than 1.5% obscuration/m and transport time less than 60 seconds for VLF-250 direct sampling and 90 seconds for VLF-250 capillary sampling or VLF-500.
- For a Class B detector, hole sensitivity must be better than 4.5% obscuration/m and transport time less than 60 seconds for VLF-250 direct sampling and 90 seconds for VLF-250 capillary sampling or VLF-500.
- For a Class C detector, hole sensitivity must be better than 10% obscuration/m and transport time less than 60 seconds for VLF-250 direct sampling and 90 seconds for VLF-250 capillary sampling or VLF-500.

These limits should be verified using ASPIRE during the design of the sampling pipe network.

The product is compliant with EN 54-20 flow monitoring requirements provided the following conditions are met:

- The minor low and minor high flow thresholds should be set at 80% and 120% respectively.
- The flow through the detector predicted by ASPIRE should be in the range 12 to 54 lpm.

Power Consumption (24 VDC Supply)

- VLF-250: 220 mA nominal, 295 mA in alarm
- VLF-500: 410 mA nominal, 490 mA in alarm

Environmental Requirements

- Temperature:
  - Ambient: 0°C to 39°C (32°F to 103°F)
  - Sampled Air: -20°C to 60°C (-4°F to 140°F)
  - Tested to: -10°C to 55°C (14°F to 131°F)
  - UL: 0°C to 38°C (32°F to 104°F)
- Humidity: 5% to 95% RH, non-condensing

Note: Please consult your Xtralis representative for information on operation outside these parameters or where sampled air is continually above 0.05% obs/m (0.015% obs/ft) under normal operating conditions.

Reference Documents

Additional installation and product information is contained in the following documents, which are available for download in the Xtralis partner extranet at www.xtralis.com.

- 07209 - VESDA VLF-500 Product Guide
- 07208 - VESDA VLF-250 Product Guide
Prepare Detector: Wiring, Pipe Inlet and Exhaust Ports (if used)
Remove the appropriate plugs for electrical cable installation (C), air sampling pipe inlet ports (A), and exhaust port (B).

- Ensure that pipes are clean and their ends are square and smooth.
- Insert the inlet and exhaust pipes (if used) into the correct inlet port (A) and exhaust port.
- Feed the electrical wiring connections through the cable entry ports.
- Use the correct cable gland size to fit into the 26 mm (1") cable entry port. Use correctly rated cable glands to maintain the required IP rating.

Warning: Always switch detector power OFF before plugging/unplugging electrical, relay or network connections. Failure to do so may cause data corruption or component failure.

Note: Do not glue the inlet and exhaust pipe into the detector ports. The product warranty will be void if the pipes are glued.

Wiring: Power, Relays, GPI, Loop Module, VESDAnet

Power and Relay Wiring

Power: There are two sets of power terminals on the main board. Connect a 24 VDC power supply to the PWR IN socket (B). If required, connect to another detector via the PWR OUT socket (A).

Relays: The relays interface to the Fire Alarm Control Panel (FACP) to communicate faults, alarms and disabled states. Relay contacts are rated 2 A @ 30 VDC, resistive. Connect as required by the system design. Use electrical wire sizes from 0.2 mm² to 2.5 mm² (24 -14 AWG). Refer to the Addressable Loop Module example.

Warning: Ensure that all wiring complies with manufacturer’s instructions and local and national fire detection code requirements. Refer to Codes and Standards Information for Air Sampling Smoke Detection section of the detector product guide for further information on wiring compliance.

Caution: DO NOT LOOP WIRE UNDER TERMINALS WHEN WIRING DETECTORS. BREAK WIRE RUNS TO PROVIDE SYSTEM SUPERVISION OF CONNECTIVITY.

Note: For information on wiring for other types of devices that may be required by the system design, refer to the detector Product Guide and documentation accompanying the device.

GPI – General Purpose Input (Terminals 1 & 2)

The General Purpose Input (GPI) is a programmable input. When the GPI function parameter is set to external, the detector shall indicate an external equipment fault condition by monitoring the line impedance. The EOL resistor provides a known termination to the external equipment, this allows the VESDA VLF fodelect open or short circuits. The detector monitors the EOL resistor.

Connection to Addressable Loop Module for Reporting Alarms and Faults

This wiring example is for wiring VESDA detectors to a typical third party Input Loop Module with three inputs. This is an example drawing. Refer to the appropriate product manual for the exact wiring details of the third party equipment.

Connection to VESDAnet

The diagram shows an example of the wiring for a closed VESDAnet loop, which is the recommended configuration. Remove the factory default A and B links from the VESDAnet sockets prior to connecting the detector to the VESDAnet. It is recommended that 120 Ohm twisted pair cables (e.g. Belden 9841) be used for including the devices in the network, with a maximum length between devices of 1.2 km. The polarity of the data wires must be maintained throughout the network. Refer to VESDAnet Interface Card Product Guide (document no. 10672) for more information.

Communications

The RS232 serial port requires a standard 9-pin DB9 PC COM serial extension cable to configure the detector using a PC with Xtralis VSC software installed, for status monitoring and command input, and for event log extraction and software upgrades.

Sampling Pipe Network

Complete the pipe network installation in accordance with the system design. Refer to the detector Product Guide and the VESDA Pipe Network Installation Guide for general information regarding pipe network installation.

- Ensure that the exhaust is open, the pipes are clear and all sampling holes have been drilled.

Power Up

Connect 24 VDC power to the Power In terminals.

Configuration

For initial configuration, use a 9 Pin DB9 PC COM Serial cable and the Xtralis VSC software.
- Perform the configuration steps mentioned in the product guide and commissioning guide then proceed with the normalization instructions below
- Let the detector run for approximately 2 minutes
- Normalize the airflow. This takes approximately 10 minutes, after which the pipe flow rates (%) should be close to 100%
- Reset the detector. It should now be running without faults.

Commissioning

- Carry out a smoke test. Refer to the product guide for further information.

Note: To remove the pipe inlet and cable entry port plugs, place a large screwdriver in the large slot and twist, or use a small screwdriver in the side slots to lever the plug out.

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UK and Europe +44 1442 242 330 D-A-CH +49 431 23284 1 The Americas +1 781 740 2223 Middle East +962 6 588 5622 Asia +86 21 5240 0077 Australia and New Zealand +61 3 9636 7000

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