

VESDA VLC-500 and VLC-505 Installation Instructions

These installation instructions provide essential information for installing VESDA VLC 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 aspirating smoke detector
- 1 mounting bracket
- 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
- RS-232 9-way serial cable for VLC-500, sliding windows HLI (VHX - 0200) for VLC-505
- 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 a Class B detector, hole sensitivity must be better than 4.5% obscuration/m and transport time less than 90 seconds
- For a Class C detector, hole sensitivity must be better than 10% obscuration/m and transport time less than 120 seconds

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 85% and 115% respectively
- The flow through the detector predicted by ASPIRE should be in the range 20 to 65 lpm

Power Consumption (18 - 30 VDC Supply)

Power Consumption 5.4 W during normal operation, 5.9 W with alarm on

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° to 38°C (32° F to 100° F)

- **Humidity:** 10-95% 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.

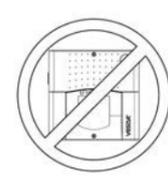
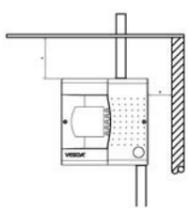
Reference Documents

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.

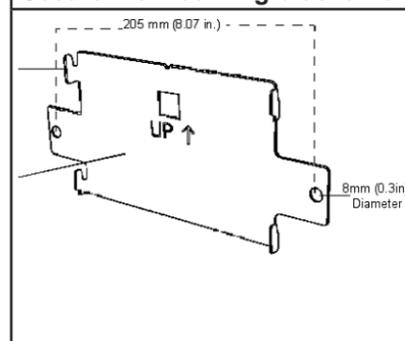
- 10280 - VESDA VLC Product Guide
- 10195 - VESDA Commissioning Guide

Installation Instructions

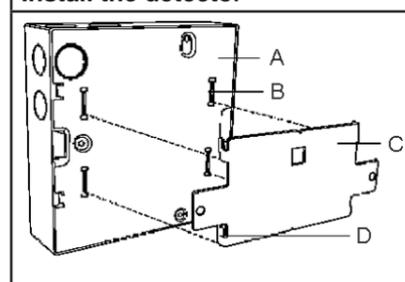
Notes

	<p>The VESDA detector can be mounted in an upright or inverted position. Do not mount the detector with a sideways orientation.</p> <p>Ensure the mounting surface is flat as this allows an air tight seal to be achieved between the sampling pipe and the tapered air inlet pipe on the detector.</p> <p>Refer to the detector Product Guide for information on inverted mounting.</p>
	<p>Ensure that there is sufficient clearance to mount the detector, noting the location of air sampling pipes and cable entry points. Due to the rigid nature of the plastic pipe, installation must provide for sufficient movement in all pipework (air inlet, air exhaust and cable pipes) to allow pipe ends to be easily fitted and removed.</p> <ul style="list-style-type: none"> • A: Minimum 50 mm (2 in.) below ceiling level. • B: The detector can be mounted directly against a wall or obstruction.

Secure the mounting bracket to the mounting surface

	<ul style="list-style-type: none"> • The mounting bracket for the VESDA VLC is always mounted in the UP direction. It is clearly marked with the word "UP" and an upward pointing arrow. • Secure the mounting bracket to the surface using appropriate fasteners, ensuring that the bracket is horizontally straight and sits flush on the surface. • Determine the ports for cable entry. Press out the tabs for the cable entry, air inlet and air exhaust ports.
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Install the detector

	<ul style="list-style-type: none"> • VESDA VLC detector. • Remove the front cover and if necessary separate it from the enclosure box. The back of the enclosure box is slotted over the four mounting bracket tabs. Slide the detector downwards until it slides onto the tabs. • Screw in the anti-tamper screw. Check to confirm that the detector does not slide off the mounting bracket.
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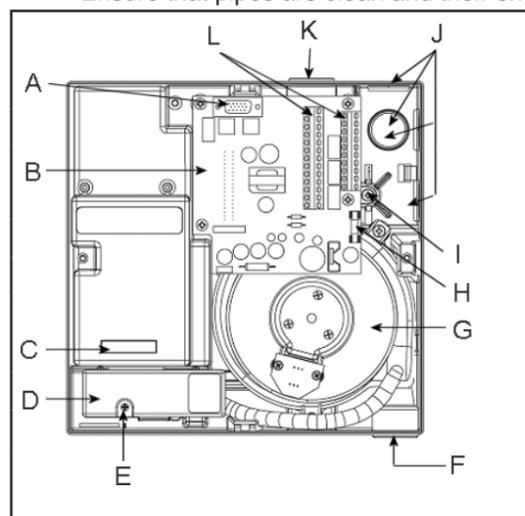
Inverted Mounting

Some system designs require that the detector be inverted. Directions for correcting the orientation of the fascia for an inverted detector are available in the Product Guide

Prepare Detector: Wiring, Pipe Inlet and Exhaust Ports

Remove the appropriate plugs for electrical cable installation (J), air sampling pipe inlet port (K), and exhaust port (F).

- Ensure that pipes are clean and their ends are square and smooth.

	<table border="1"> <tr> <td>A</td> <td>Programming socket 15 Pin for VLC-505 9 Pin for VLC-500</td> </tr> <tr> <td>B</td> <td>Termination card</td> </tr> <tr> <td>C</td> <td>VESDAnet number</td> </tr> <tr> <td>D</td> <td>Air filter cartridge</td> </tr> <tr> <td>E</td> <td>Filter screw</td> </tr> <tr> <td>F</td> <td>Air exhaust port</td> </tr> <tr> <td>G</td> <td>Aspirator</td> </tr> <tr> <td>H</td> <td>1.6 Amp fuse</td> </tr> <tr> <td>I</td> <td>Anti tamper screw</td> </tr> <tr> <td>J</td> <td>Cable entry ports</td> </tr> <tr> <td>K</td> <td>Air inlet port</td> </tr> <tr> <td>L</td> <td>Wire terminal strips</td> </tr> </table>	A	Programming socket 15 Pin for VLC-505 9 Pin for VLC-500	B	Termination card	C	VESDAnet number	D	Air filter cartridge	E	Filter screw	F	Air exhaust port	G	Aspirator	H	1.6 Amp fuse	I	Anti tamper screw	J	Cable entry ports	K	Air inlet port	L	Wire terminal strips
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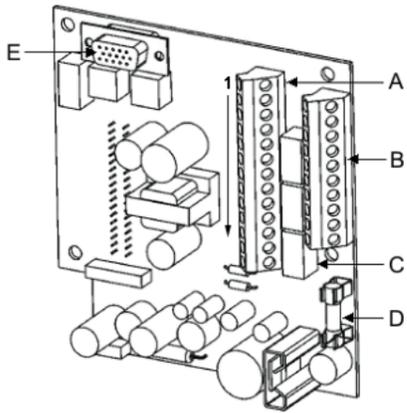
- Insert the inlet and exhaust pipes (if used) into the correct inlet ports (K) and exhaust port (F).
- Feed the electrical wiring connections through the cable entry ports.
- Use the correct cable gland size to fit into the 26 mm (1") cable entry port. Use correctly rated cable glands to maintain the required IP rating.

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

VESDA VLC-500 and VLC-505 Installation Instructions

Wiring: Power, Relays, GPI, Loop Module, VESDAnet VLC-505

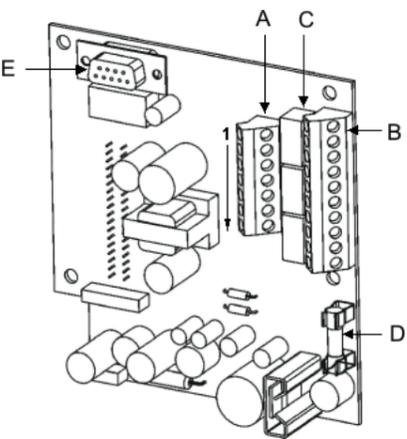
Warning: Always switch detector power OFF before plugging/unplugging electrical, relay or network connections. Failure to do so may cause data corruption and/or component failure.



VLC-505

Terminal A		Terminal B	
1	Bias (-) (GND)	1	Shield
2	Reset (-) (GPI)	2	VESDAnet A (-)
3	Reset (+) (GPI)	3	VESDAnet A (+)
4	Bias (+)	4	Shield
5	LED (-) (GND)	5	VESDAnet B (-)
6	LED (+)	6	VESDAnet B (+)
7	FIRE (NO)	7	Power (-)
8	Fire (C)	8	Power (+)
9	Pre-Alarm (NO)	9	Power (-)
10	Pre-Alarm (C)	10	Power (+)
11	Fault (NO)	NC = Normally Close	
12	Fault (C)	NO = Normally Open	
13	Fault (NC)	C = Common	

Legend			
A	Terminal A	D	1.6 Amp Fuse
B	Terminal B	E	VESDAnet Socket
C	Relays		



VLC-500

Terminal A		Terminal B	
1	FIRE (NO)	1	Bias (-) (GND)
2	Fire (C)	2	Reset (-) (GPI)
3	Pre-Alarm (NO)	3	Reset (+) (GPI)
4	Pre-Alarm (C)	4	Bias (+)
5	Fault (NO)	5	LED (-) (GND)
6	Fault (C)	6	LED (+)
7	Fault (NC)	7	Power (-)
NC = Normally Close		8	Power (+)
NO = Normally Open		9	Power (-)
C = Common		10	Power (+)

Legend			
A	Terminal A	D	1.6 Amp Fuse
B	Terminal B	E	VESDlink Socket
C	Relays		

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.

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. If required, connect to another detector via the PWR OUT.

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.

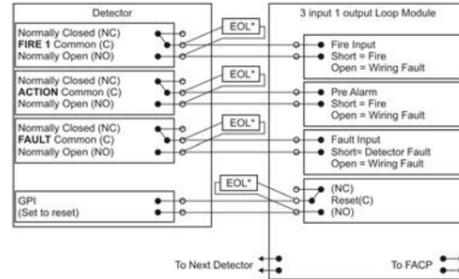
Caution: DO NOT LOOP WIRE UNDER TERMINALS WHEN WIRING DETECTORS. BREAK WIRE RUNS TO PROVIDE SYSTEM SUPERVISION OF CONNECTIVITY.

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

This terminal is used to "Reset + Isolate", "Mains OK" or "Standby" functions. The input terminal requires a voltage supply between 5V and 24 VDC to operate. The voltage input to this terminal is isolated from the system by an optocoupler device. Connect the Reset (+) terminal to the Bias (+) terminal and the Reset (-) terminal to the relay / switch output of the external device which is connected in series to the Bias (-) terminal. Refer to the Product Guide for further information.

Connection to Addressable Loop Module for Reporting Alarms and Faults

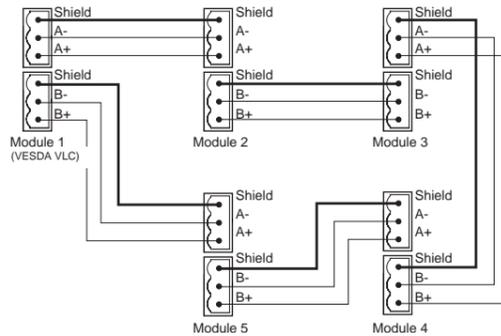


This wiring example is for wiring VESDA detectors to a typical third party Input Loop Module with three inputs.

This is an example drawing. Refer to the appropriate product manual for the exact wiring details of the third party equipment.

* EOL = End of Line Resistor

Connection to VESDAnet For VLC-505



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 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.

Communications

- VESDAlink socket VLC-500
- VESDAnet socket for VLC-505

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 pipe is 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 VESDAlink or VESDAnet connection 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 and commissioning guide for further information.

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