



VESDA Exd<sup>TM</sup>

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# **INSTALLATION & PRODUCT MANUAL**

**VESDA Exd<sup>TM</sup>**  
**Explosion Proof Smoke Detector**  
**VLX-100**

**July 2003**

**Revision 01**

### **Summary of limitation of liability for Vision Fire & Security**

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**Scope of this Manual**

This manual is intended to cover the installation and performance of basic power and preliminary device checks for the VESDA Exd detector. It does not cover information for commissioning. All VESDA equipment is to be commissioned by personnel who have attended a VESDA accreditation course.

Use the checklist in Section 6 to verify that the installation has been correctly completed. Fill out the details in the checklist sheet for the site and submit it to the appropriate personnel.

**Publication history**

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In accordance with its policy of continuing product and system improvement, Vision Fire & Security reserves the right to change designs or specifications without obligation and without further notice.

**Codes and Standards Information**

Vision Fire & Security strongly recommends that this guide is read in conjunction with the appropriate local codes and standards for smoke detection systems and electrical connections. This guide contains generic information and some sections may not comply fully with all local codes and standards. In these cases the local codes and standards must take precedence.

**Explosion Protection Information**

The **VESDA Exd** is approved for "Exd IIB T6"

"IIB" denotes approval for operation in presence of Gas Group IIB, which includes ammonia, propane methanol.

"T6" denotes a Temperature Rating of 85°C. This is the maximum surface temperature rise when operating in an ambient of 39°C and subject to internal explosion tests.

### Approvals and Standards

The product complies with the following standards.

Exd IIB T6 Certificate Number AUS Ex 03.3854X

Gas Group IIB

T6 Temp Rating

VESDA Exd™ protection to AS2380-2

IP66 protection to AS1939

Recommended for use in Zone 2 environments

ATEX Classification CE Ex II 3 G

Category 3 equipment for gas, vapour or mist hazards

Certificate number ITS03ATEX11273

Recommended for use in Zone 2 environments

AS 1603.8      FCC Class B

AS/NZS 3548    AS2211

EN50018-1     21 CFR 1010.2

EN50130-4     21 CFR 1010.3

EN 60950

IEC 60079-1

### Safety Labels

The VESDA Exd™ incorporates a Laser device and is classified as a Laser product that complies with FDA Regulations 21 CFR 1040.10 and 1040.11. The laser is housed in a sealed Detector chamber and contains no serviceable parts. This laser emits invisible light and can be hazardous if viewed with the naked eye. **Under no circumstances should this chamber be opened.** There is a safety label on the chamber as shown below.



### *The Laser Warning Label*

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# 1 Introduction

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## 1.1 Overview

The VESDA Exd is an aspirating smoke detector mounted in an explosion proof enclosure that provides all the benefits of aspirating smoke detection, including very early warning, for enclosed areas. It is designed to sample air from a hazardous rated environment.

The detector operates by drawing air from a protected area via a pipe network. The sampled air is drawn and exhausted through inline flame arrestors that will stop any flame from entering the sampling pipe network. In the event of ignition of flammable gases by the detector, any resulting explosion is contained within the VESDA Exd enclosure.

## 1.2 Features

The VESDA Exd is rated for “Ex d IIB T6”. Gas Group IIB includes ammonia, propane and methanol.

A flame Arrestor is mounted on each outlet to protect the enclosure. Each flame Arrestor contains an element with a pore size of 0.15mm.

Once inside the detector, a sample of the air is filtered to remove dust and dirt before it is passed through the laser detection chamber. Smoke present in the detection chamber creates light scattering, which via sophisticated electronics produces a signal representing the absolute level of smoke present.

The VESDA Exd can be programmed to have 2 or 3 alarm thresholds, which can be set across its wide sensitivity range to provide both very early warning of a potential fire situation and allow the initiation of further control procedures should the smoke level increase.

## 1.3 VESDA Products

VESDA products are only distributed through trained and accredited channels.

It is understood that personnel installing this equipment are familiar with the VESDA technology and have a good understanding of local codes and standards regarding installation of electrical equipment and cabling in hazardous environments. Installation engineers should be certified where appropriate.

For details of your nearest Accredited Distributors please contact Vision Fire & Security. Contact details are at the back of this document.



## 1.4 Product Specifications

|   |   |
|---|---|
| Supply Voltage                              | <b>18 to 30VDC</b>  |
| Power Consumption                           | 8.04W quiescent, 8.6W with alarm.   |
| Current Consumption                         | 335mA at 24VDC quiescent, 360mA with alarm.   |
| Fuse Rating                                 | 1.6A  |
| Dimensions (WHD)                            | 490mm x 358mm x 208mm<br>(19½ in x 14½ in x 8¼ in).   |
| Enclosure Weight                            | 44kg (88lbs).   |
| Enclosure Material                          | Marine Grade Aluminum.  |
| Torque Ratings                              | Enclosure Front Bolts: 40 N-m (30 Ft-lbs).<br>Cable Plugs: 50 N-m (37 Ft-lbs).<br>Sampling Pipe locknut: 40 N-m (30 Ft-lbs).<br>Flame Arrestor Hexagon Nut: 80 N-m (63 Ft-lbs).   |
| Operating Temperature                       | Detector Ambient: -10° to 39°C (14°F to 103°F).<br>Sampled Air: -20° to 60°C (-4° to 140°F).<br>Humidity: 10- 95% RH, non-condensing.   |
| Explosion Rating                            | Ex d IIB T6   |
| Gas Group                                   | IIB   |
| IP Rating                                   | IP66  |
| Sampling Pipe Network                       | Single pipe network maximum of 50m (164ft).<br>Twin Branched Pipe maximum of 30m (98ft) per branch.<br>Maximum of 10 Sample holes in all cases.<br><b>NOTE: Minimum number of Sampling Holes per pipe network is 2 (inc End cap vent).</b>                                  |
| Sampling Pipe Size                          | ID: 15-21mm (9/16in – 7/8in)<br>OD: 25mm (1in)  |
| Sampling Pipe Gland                         | 2 x 25mm (1in) with inline deflagration flame arrestor  |
| Electrical Cable Glands                     | 4 x M25 holes for Exd-approved cable glands (not supplied). Unit shipped with Exd blanking plugs only.  |
| Laser Detector Cable Termination (internal) | Screw terminal blocks (0.2- 2.5sq mm, 30-12 AWG)  |
| Alarm Threshold Setting Range               | Alert: 0.005 – 1.990% obs/m<br>(0.0015 - 0.6218% obs/ft)<br>Pre-Alarm: 0.010 –1.995% obs/m<br>(0.0031 - 0.6234% obs/ft)<br>Fire: 0.015 – 20.00% obs/m<br>(0.0046 – 6.25% obs/ft) **<br>** Limited to 4% obs/ft for <b>UL approved projects</b>                              |
| Key Software Features                       | Event log: up to 12,000 events stored on FIFO basis.<br>Smoke level, alarms and faults with time and date stamp.<br>AutoLearn: Minimum 15 minutes, maximum 15 days.<br>Recommended minimum period 14 days. During AutoLearn thresholds are NOT changed from pre-set values. |

**Table 1 Product Specifications**

## 1.5 Application

Figure 1 shows a typical example of the zone classifications for hazardous areas.

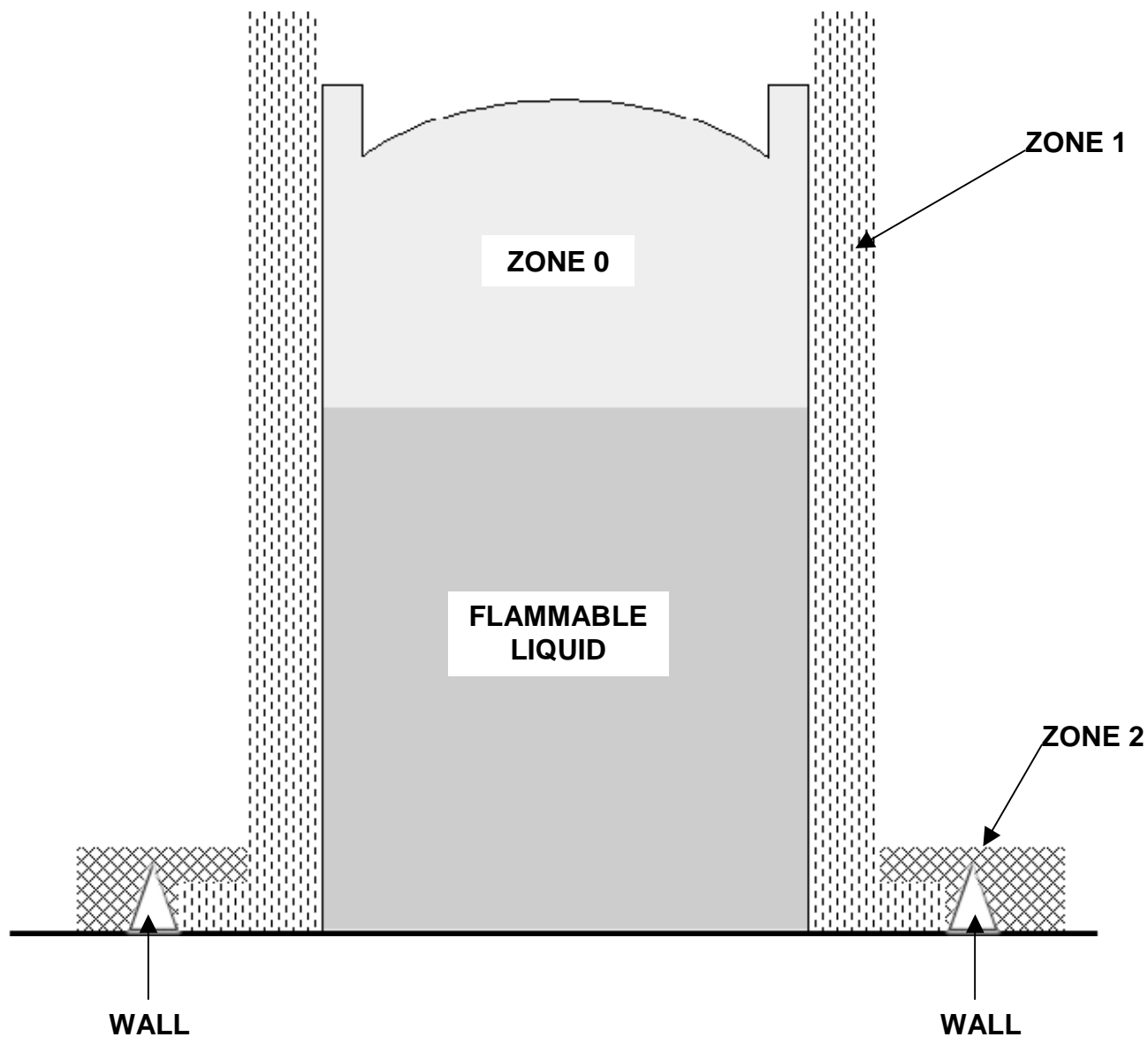


Figure 1 Typical Example of Hazardous Area Zone Classification

The VESDA Exd has Exd IIB T6 rating. This rating allows for safe operation in Zone 2 environments and potentially in Zone 1 environments. However, prolonged exposure to hydrocarbons will affect detector performance and reduce operational lifespan.

It is strongly recommended to conduct regular smoke tests in environments where the detector is exposed to abnormal or intermittent concentrations of flammable material (such as in a Zone 1 environment) to prove satisfactory detection performance. Furthermore, in regions where the ATEX directive is relevant, special consideration must be given to the application of this “Category 3” equipment in a Zone 1 environment, as this is not standard practice under ATEX 99/92/EC. In such regions, VESDA Exd may only be used in Zone 1 applications where the explosion protection risk assessment explicitly allows for it.

**NOTE 1: The responsibility of Zone Classification lies with the end user/operator department.**

**NOTE 2: The Flame Arrestors in the VESDA Exd have a pore size of 0.15mm. This product should not be used in heavily contaminated (dusty) areas.**

### 1.5.1 New Terminology

Below is a guide to the zone classifications across a number of agencies.

- New IEC/CENELEC “Zones only” Terminology
  - •E.g. “Class I Zone 2” è “Zone 2”
  - •E.g. “Class II Zone 1” è “Zone 21”

| Agency        | Flammable Material Present Continuously | Flammable Material Present Intermittently | Flammable Material Present Abnormally         |
|---------------|---|---|---|
| IEC / CENELEC | Zone 0<br>Zone 20 (for dust)            | Zone 1<br>Zone 21 (for dust)              | <b>Zone 2</b> (for gas)<br>Zone 22 (for dust) |
| US NEC 505    | Zone 0                                  | Zone 1                                    | Zone 2  |
| US NEC 500    | Division 1                              |   | Division 2                                    |

## 2 Conditions of Safe Use

---

Below is a summary of items that should be taken into account during the design, installation and use of the VESDA Exd product. This list is not exhaustive and local codes and standards should be followed.

- The VESDA Exd is suitable for gas **group IIB environments** only. Use of this product in other hazardous environments may cause the unit to perform incorrectly and will invalidate your product warranty.
- The VESDA Exd is recommended for use in Zone 2 environments.
- The VESDA Exd may be used in Zone 1 environments but the following points must be considered.
  1. Exposure to hazardous chemicals (e.g. Hydrocarbons, solvents, or acids) may damage the VESDA Exd leading to operational failure of the detector. Sufficiently high concentrations of these chemicals may typically be found in zone 1 environments.
  2. The unit is CE marked as Category 3 equipment. Zone 1 environments normally require the use of category 2 equipment unless the explosion protection risk assessment states otherwise.
- A smoke test must be conducted after every abnormal condition experienced in zone 2 environments.
- Ensure that all flame Arrestors, cable glands, unused holes, front cover bolts and front cover flange are clean, undamaged and tightened correctly as specified in this manual.
- No other penetrations may be made into the enclosure. Doing so invalidates the detector Exd rating.
- Enclosure flange surfaces must be kept clean and undamaged as scratches or other damage may provide a flame transmission path thereby decreasing the Exd rating of the detector.
- It is important to not cross thread any bolts as this will decrease the Exd rating of the detector.
- The VESDA Exd is heavy and requires special consideration for mounting location and wall attachment. It should only be installed with the assistance of lifting equipment in a location deemed suitable by a structural engineer.
- The VESDA Exd must only be installed, configured and powered by VESDA accredited personnel.
- The use of inline deflagration (flameproof) cable glands on the enclosure requires suitable termination procedures to be followed in accordance with EN50018: 2000 or relevant standards and local wiring codes for explosion proof and hazardous environments.
- Ensure pipe designs fall within the design parameters as detailed in this manual.
- The VESDA Exd is not approved for use in hazardous dust environments (i.e. Class 2 or Zone 2x environments.)
- In-line filters will have a detrimental impact on the efficiency of the pre-configured pipe designs outlined in this manual and therefore should not be used.
- The flame arrestors need to be inspected and serviced regularly to ensure that there is no build up of solids or liquids in the element. Clogging or obstruction of the flame arrestors will cause the detector to fail to detect smoke and will violate its "Exd" rating.
- It is the responsibility of the maintenance engineer/maintenance service provider to determine the inspection and service period for the flame arrestor. The maintenance interval is governed by the amount and type of particulates in the system where the unit is installed. The responsible party should check the element in the first few months of operation to determine how quickly particulates are accumulating.
- Minimum number of Sampling Holes per pipe is 2 (1 + End cap vent).
- The responsibility of Zone Classification lies with the end user/operator department.
- This product should not be used in heavily contaminated (dusty) areas where the dust may lead to blockage of the Flame Arrestor.
- No smoke spray or spray of any hydrocarbon to be used to test for smoke in any part of the VESDA Exd detector.
- Before opening the VESDA Exd enclosure, ensure that the protected area is completely free of explosive gases and that proper authority has been granted to access the unit and that compliance to all required safety procedures is undertaken. All electrical power must be disconnected from the unit before opening the enclosure.
- The VESDA LaserCOMPACT VLC-Exd detector has been specially modified for use in the Exd enclosure. The standard VLC-505 is not suitable for installation in the Exd enclosure.

- The basic fail/pass smoke test specified in this manual verifies the detector will sense smoke. It does not replace an appropriate commissioning test.
- For the VESDA Exd enclosure to meet the “Exd IIB T6” compliance requirements, the twenty (20) cover screws must be correctly and evenly tightened to the specified torque setting. Use a suitable torque wrench to set each screw to approximately 40N-m (30 ft-lb) torque.
- The detector may show faults immediately after power up as normal behavior. Reset the unit by pressing the RESET switch on the front cover of the detector to unlatch the relays and fault lights. The fault light on the front cover will light up and this is normal.
- When used as a stand-alone detector the VESDA<sup>net</sup> terminals must be wired as per Figure 13.
- While an Open Loop VESDA<sup>net</sup> configuration is possible, it is strongly recommended that the Closed Loop configuration be installed to achieve a fault tolerant loop.
- The maximum specified length for the RS485 cable between any two devices on the VESDA<sup>net</sup> network is 1300m (4000ft).
- The Air Inlet or Exhaust pipe connection must not be glued. Glued connection makes disconnecting the sampling air pipe from the detector for maintenance extremely difficult and will result in damage to the equipment.
- If any alterations are made to the pre-configured pipe layouts, a Smoke Test must be conducted to confirm that the Transport Time, Hole Balance and Hole Share values are within the acceptable range.
- It is recommended that the detector be located in the environment being monitored to overcome any possible negative pressure effects between the sample holes and the detector exhaust.
- The input states are not defined for any voltages > 2 to < 5 VDC of the General Purpose Input.
- This manual does not purport to cover all safety situations and as such installation, operation and maintenance work should be undertaken in accordance with local codes and standards.
- Flame Arrestors MUST be installed in the correct orientation with the ENCLOSURE label on the enclosure side.

### 3 Product Description

#### 3.1 Product Model, Approvals and Standards Label

Labels similar to that shown are located at the bottom of the VESDA detector enclosure and the front of the enclosure display the detector model, approvals and standards.

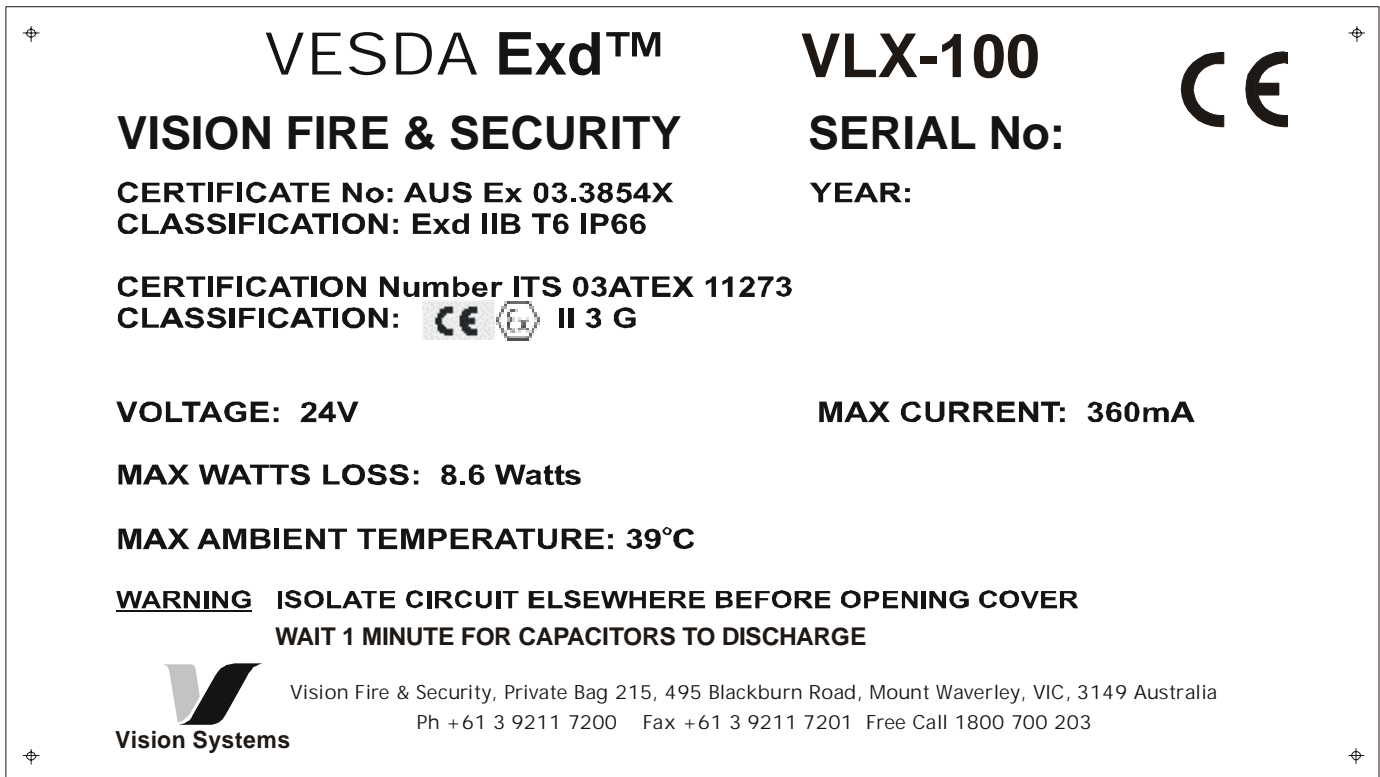


Figure 2: VESDA Exd Front Label

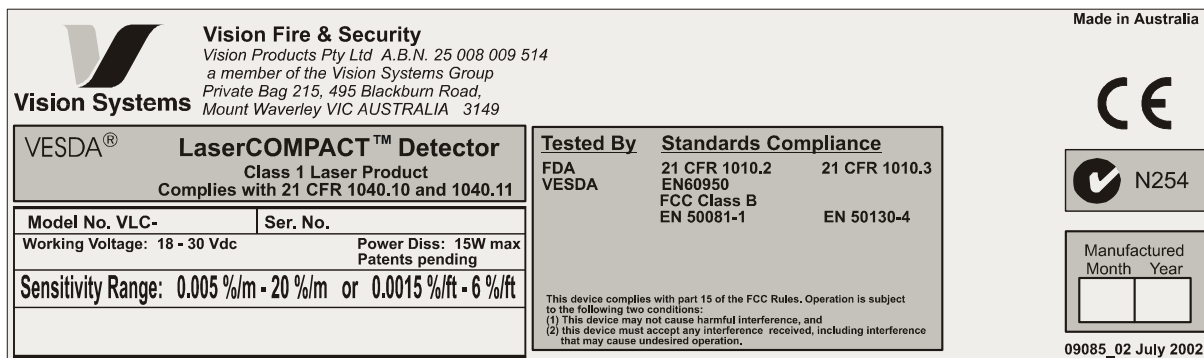
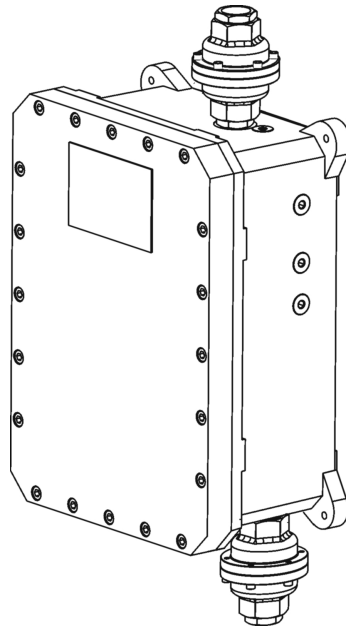


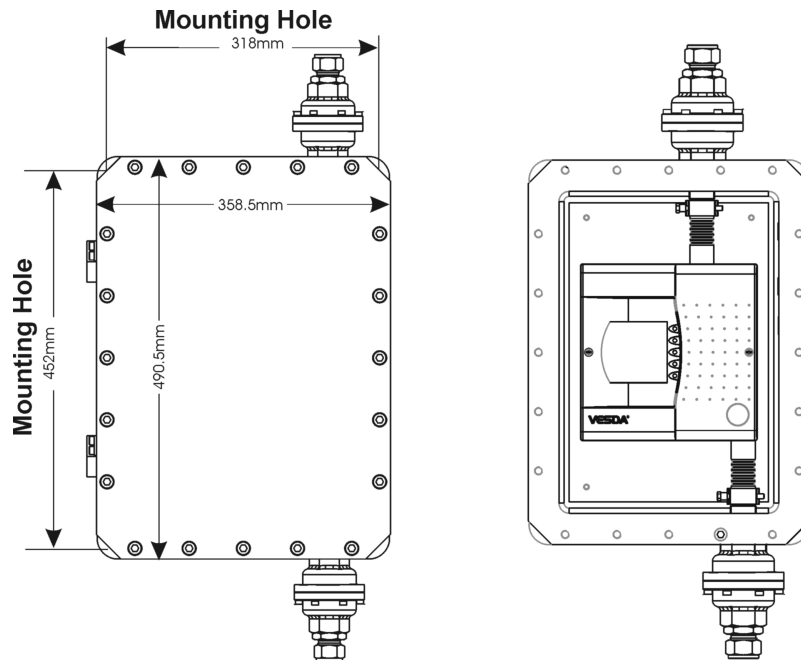
Figure 3 VESDA Detector Standards & Approvals Label

### 3.2 VESDA Exd Enclosure

The VESDA Exd enclosure is an explosion proof box cast and machined in marine grade aluminum. It is normally fixed to a wall using four mounting holes (See Figure 4). The mounting holes accept 10mm bolts.



**Figure 4 VESDA Exd Enclosure illustrating Mounting Lugs**



**Figure 5 Dimensions of the VESDA Exd enclosure and its internal layout**

The enclosure outer cover is held in place by 20 M8 bolts which should be tightened to 40N-m (30 ft-lb) torque. The sealed cable entry gland on the enclosure side supports cable sizes up to 18 mm ( $\frac{3}{4}$ in).

### 3.3 Detector Assembly Description

The VESDA detector mounted inside the enclosure is a special LaserCOMPACT detector (Spare Part VSP-405) and cannot be seen when the enclosure cover is in place. The components of the detector are housed inside a gray plastic body with a decal fascia on the front cover and a metal back panel. The front cover is removable and is secured to the mounting box with two screws located on the left and right hand side of the cover. The plastic tie attaches the cover to the mounting box. It is removable and is used to prevent strain on the cable loom. The detector contains two parts:

#### a) The Front Cover

The front cover (Refer to Figure 2 and Section 3.5) houses the following components:

- 5 LED's to indicate Fire, Pre-Alarm, Fault, OK and Reset/Isolate states
- Reset/Isolate Push Button Switch

#### b) The Mounting Box

The mounting box houses the following components:

- Termination Card (Refer to Section 3.6)
- Cable Entry Ports (Refer to Section 3.7)
- Air Inlet Port (Refer to Section 3.7)
- Air Filter Cartridge (Refer to Section 3.8)
- Aspirator (Refer to Section 3.9)
- Air Exhaust Port (Refer to Section 3.10)
- Laser Detection Chamber (Rear of enclosure, refer to Section 3.11)
- Central Processing Card (Rear of enclosure, refer to Section 3.12)

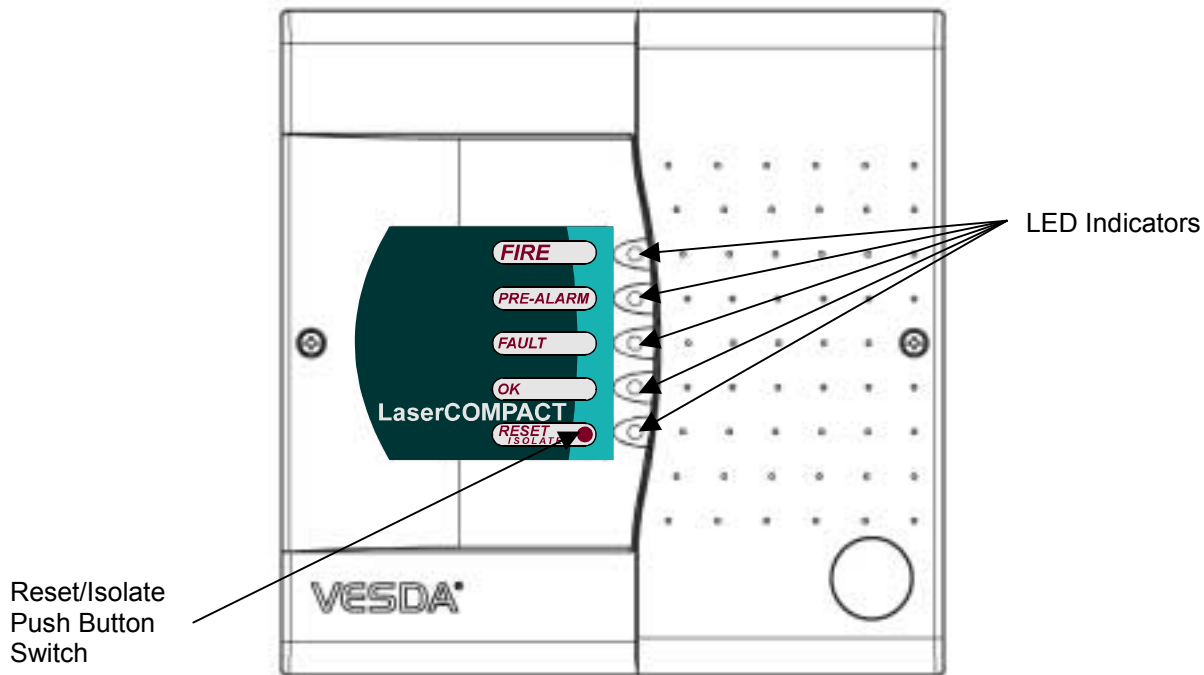
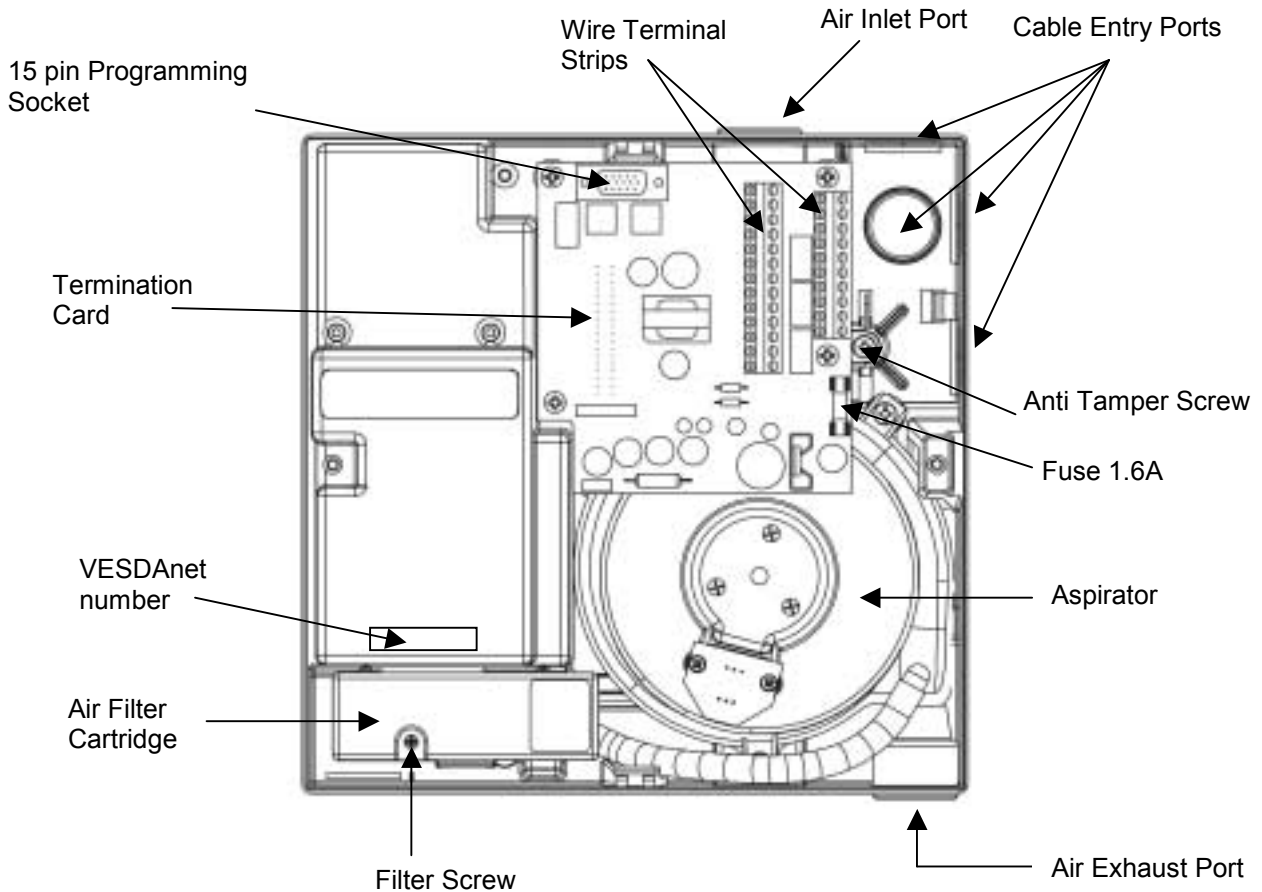


Figure 6 Front View of Detector





**Figure 7 Component Locations in the Detector (Front Cover Removed)**

### 3.4 Detector Mounting in Exd Enclosure

The detector is mounted on a special plate within the VESDA Exd enclosure. The mounting plate has 4x 7mm (1/4in) standoffs between it and the enclosure wall.

### 3.5 Front Cover and LED's

The front cover has a self adhesive printed decal attached next to the LED display. On the rear of the cover is a card with LED's and a Reset switch. This card connects to the termination card with a wire loom labeled LED CARD. The front cover hangs down from the enclosure by a plastic tie when the cover is in the open position and ensures that the cable loom is not stressed.

**NOTE:** During normal operation the Exd enclosure cover will be in place and the detector front cover cannot be seen. It is suggested that a VESDA LaserCOMPACT Remote Display be installed on the same VESDAnet loop to view alarms and faults (refer to section 1).

### 3.6 Termination Card

This card is attached to the detector enclosure with four screws. This is an interface card that allows power, VESDAnet, relay and auxiliary wires to be connected to the detector. There are two wire terminal strips on the card to terminate the wires. The maximum wire size that can fit into the terminal is 2.5sq mm (12AWG).

The power protection fuse (1.6A) is removable and protects the detector electrical system against short circuit or overload. The DC power converters on this card steps down the incoming DC power to lower voltages.

### 3.7 Detector Cable and Air Inlet Entry Ports

There are four cable entry ports on the right hand side of the detector. There is one air inlet port located on the top of the enclosure that allows the sampled air to enter into the detector for analysis. The size of the air inlet port is 25mm (1in) Ø. A VESDA Pipe is fitted securely into the inlet port. A flexible hose connects the VESDA pipe to the flame arrestor. These pipe connections **must NOT be glued**. **Figure 5** illustrates the pipe connection between the detector and the flame arrestor.

### 3.8 Air Filter Cartridge

The air filter cartridge is located at the bottom left hand side of the detector box and is held in place by a single recessed screw. The filter elements are housed inside a disposable cartridge and **cannot** be cleaned for reuse. To remove the air filter cartridge, undo the screw and lift out the air filter cartridge. The sampled air from the environment passes through two stages of filters within the cartridge. The first stage removes the large particles of dirt and allows the smaller smoke particles to pass into the detection chamber for analysis. The second stage removes the smaller particles of dirt and passes very clean air into the detection chamber to keep the optical surfaces clean.

**NOTE: The filter life is dependent on the environment.**

### 3.9 Aspirator

The aspirator draws in air through a network of sampling air pipes and passes a small sample of the filtered air into the laser detection chamber. The rest of the air is forced out through the exhaust pipe located at the bottom of the enclosure. The aspirator runs at a constantly regulated speed. The airflow through the aspirator is monitored continuously. An airflow sensor is located inside the air inlet port and the user is prompted when there is a reduction or an increase in the airflow.

### 3.10 Air Exhaust Port

This port allows the sampled air to be expelled into the environment. There is one air exhaust port and is located at the bottom right hand side of the enclosure. The size of the air exhaust port is 25mm (1in) Ø. A VESDA Pipe is fitted securely into the exhaust port. A flexible hose connects the VESDA pipe to the flame arrestor. These pipe connections **must NOT be glued**. **Figure 5** illustrates the pipe connection between the detector and the flame arrestor.

### 3.11 Laser Detection Chamber

The Laser detection chamber is located in the rear of the detector enclosure behind the metal back panel.

---

**Caution: This component is inaccessible, not serviceable and the metal back panel is not to be opened by any personnel.**

---

In this chamber, a small portion of the smoky air passes through a laser beam causing light scattering. The scattered light is analyzed by the central processor card to determine the smoke density or obscuration.

### 3.12 Processor Card

The central processor card is located in the rear of the enclosure behind the metal back panel.

## 4 Operation

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A pipe network, with sampling holes positioned to optimize the smoke detection capability of the system is connected to the VESDA Detector. The VESDA Exd draws air from the protected area through a pipe network. The sampled air passes through a Flame Arrestor before reaching the detector.

An aspirator draws air through the detector's inlet manifold. The First Stage Air Filter removes dust and dirt from the sampled air and a small percentage of this flow to the detector chamber for smoke detection. The Second Stage Filter further filters the air to ultra clean air. The ultra clean air is used to protect the optical surfaces of the detection chamber from contamination.

The detection chamber uses a stable highly efficient laser light source and unique sensor configuration to achieve the optimum response to a wide range of smoke types. When smoke passes through the detection chamber it creates light scatter that is detected by the very sensitive sensor circuitry.

The exhaust air from the detector passes through a Flame Arrestor before being returned to the protected area. This ensures that an ignition within the enclosure is not a threat to the protected area.

The sampled air is drawn and exhausted through inline deflagration flame Arrestors that will stop any flash or flame entering the sampling pipe network and entering the gas environment. In the event of ignition of hazardous gases within the smoke detector unit, any resulting explosion is contained within the Exd enclosure.

It is recommended that a Remote VESDAnet Socket is installed on the same VESDAnet loop to allow communication with the detector without the need to open the Exd cover in a hazardous area.

## 5 GPI Functions

The General Purpose Input (GPI) provides limited remote control in lieu of a remote display being connected. It is highly recommended that a remote display be used to interact with the VESDA Exd detector as much more control is afforded to the user.

The General Purpose Input may be configured to initiate previously defined action depending on the current applied to the GPI.

The auxiliary terminals on the termination card are **Bias**, **Reset** and **LED**. Refer to Section 9.8 for wire connection details. These terminals have the following functions:

- Bias terminals:** This provides 10VDC supply to power the Reset input terminals via a remote ON/OFF switch.
- LED terminals:** This provides a 5VDC, 15mA supply via a 220-ohm resistor to drive an external LED that could be located in another part of the building.
- Reset terminals (GPI Input):** This is also known as the General Purpose Input (GPI) and is used for one of these three functions: **Reset**, **Mains OK** or **Standby**. The Reset terminals can be programmed to one of the functions if required and requires 5 to 33VDC to operate. Any input into this terminal overrides the Reset switch on the front panel. These functions operate as follows:

|                           |  |
|---------------------------|--|
| <b>Reset/<br/>Isolate</b> | The detector Isolates when $\geq 5$ VDC is applied to this terminal and Reset when the voltage drops $\leq 2$ VDC.   |
| <b>Mains<br/>OK</b>       | The detector monitors the state of the external power supply and responds to the following conditions.<br>Mains OK $\geq 5$ VDC is at this terminal<br>Mains Fail $\leq 2$ VDC is at this terminal |
| <b>Standby</b>            | The detector Isolates and the aspirator turns OFF when $\geq 5$ VDC is at this terminal.   |

**Table 2 GPI Functions**

**Note:** The input states are not defined for any voltages  $> 2$  to  $< 5$  VDC.

## 6 Event Log

---

The detector stores and logs up to a maximum of 12,000 events on a first in first out basis. By regulation, detectors are normally required to be powered from a battery backed DC power supply. This ensures that the log is held indefinitely.

If the detector has to be powered off, it is advisable to download the Event Log to a PC before power is disconnected. The VConfig PRO application software allows down loading of the Event Log to a PC. This is strongly recommended.

## 7 Pipe Network Design

Below are two pipe arrangements that can be used for the VESDA Exd. It is recommended that the sample holes sizes remain constant on all VESDA Exd pipe designs to ensure good Sample Hole Balance and Pipe Share. A sample hole size calculator is provided in Section 7.3.

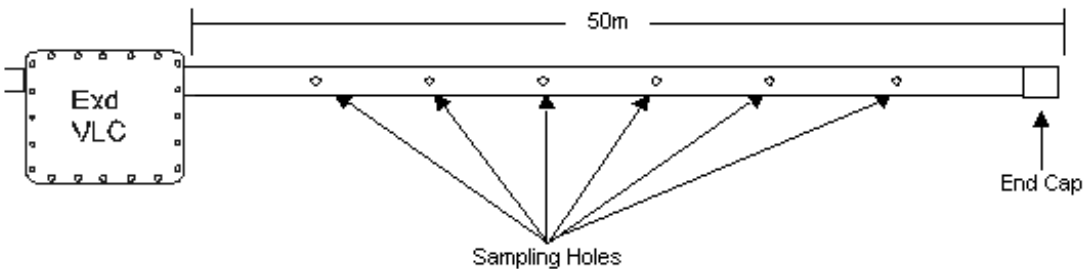
---

**Caution:** It is always recommended that a Smoke Test be conducted to confirm detector performance.

---

### 7.1 Single Pipe Layout

The single pipe layout can support a maximum total length of 50m (approx. 260ft) and up to a maximum of 10 sample holes.



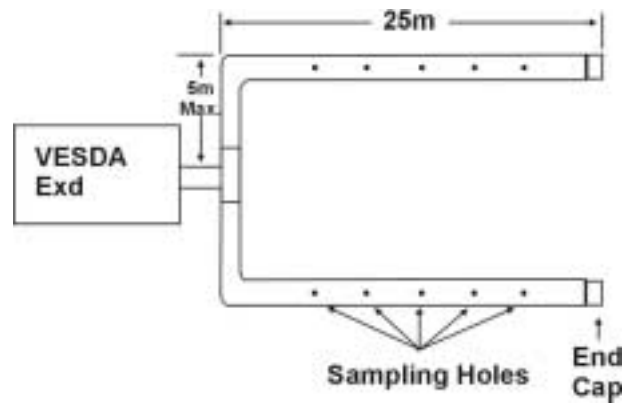
**Figure 8 Single Pipe layout**

It is recommended that all sample hole diameters are the same to ensure good Hole Balance and Pipe Share. The table below provides an estimation of the Transport Time for a 50m pipe with certain holes sizes.

| Number of Holes<br>(Total) | Diameter    |             | Transport Time |
|----------------------------|-------------|-------------|----------------|
|                            | Metric      | Imperial    |                |
| 8                          | 2.5 – 3.0mm | 3/32"       | ~95s           |
| 6                          | 2.5 – 3.5mm | 1/8"        | 70-77s         |
| 4                          | 3.0 – 4.0mm | 1/8 – 5/32" | 55-63s         |

### 7.2 Branched Pipe Network

A twin branch pipe network can support up to 10 sample holes, 5 per branch, (including the End Caps). The maximum length of each branch from the detector to the end cap vent is 30m (98ft). The maximum length between the detector and the branch **must NOT exceed 5m (approximately 16ft)**.



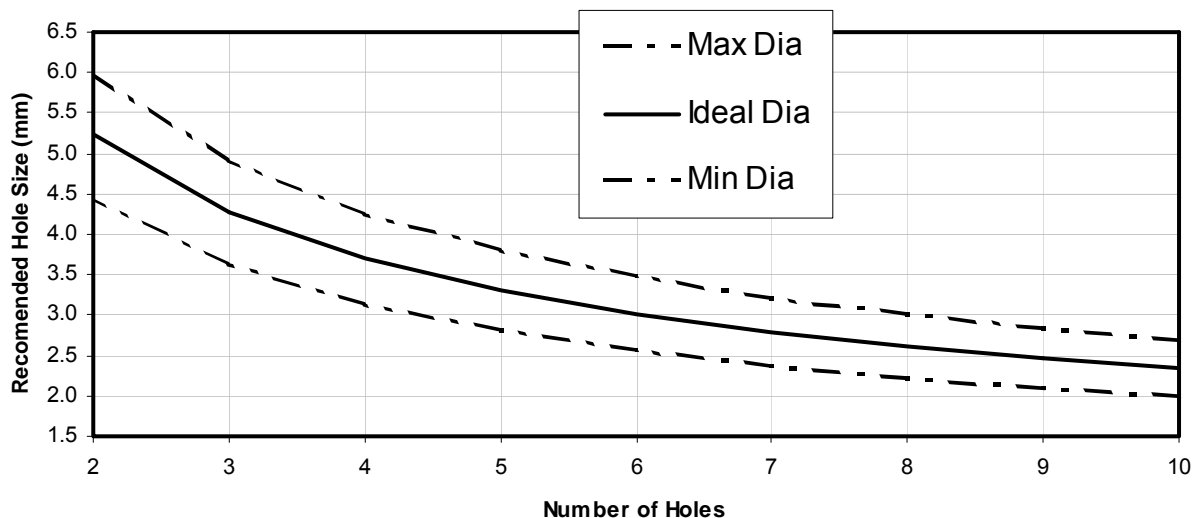
**Figure 9 Illustrates a branched pipe layout.**

For a 30m-branched pipe design, with the following number and size of holes, the estimated Transport Times are provided.

| Number of Holes<br>(Total) | Diameter    |          | Transport Time |
|----------------------------|-------------|----------|----------------|
|                            | Metric      | Imperial |                |
| 10                         | 2.0 – 2.5mm | 3/32"    | ~110s          |
| 8                          | 2.0 – 3.0mm | 3/32"    | 97-120s        |
| 6                          | 2.5 – 3.5mm | 1/8"     | 84-102s        |

### 7.3 VESDA Exd Sample Hole Calculator

The graph below provides a simple guide on what size sample diameters should be used based on the total number of holes.



## 7.4 Exhaust Pipe for Negative Pressure Environments

To overcome negative pressure gradients between the sampled environment and the detector location it is common practice to pipe the exhaust back to the sampled environment. It is important that the pressure at the sampling holes is not less than the pressure at the exhaust. Therefore, it is recommended that the detector be located in the environment being monitored to overcome any possible negative pressure effects.

Should the use of an exhaust return be required consideration should be given to the positioning of the detector to minimize this pipe length.

A smoke test should always be conducted to test the performance of the pipe network.



## 8 Battery Backup Calculations

The nominal battery voltage is **24 VDC**.

Use Table 1 (Product Specifications) to calculate and to determine the battery backup requirements for your fire detection system.

| EQUIPMENT                | NORMAL LOAD @ 24 V DC |     |  | FULL ALARM LOAD @ 24 VDC |     |            |
|--------------------------|-----------------------|-----|--|--------------------------|-----|------------|
|                          | LOAD (mA)             | QTY | TOTAL (mA)                                     | LOAD (mA)                | QTY | TOTAL (mA) |
| VESDA Exd                | 335                   |     |  | 360                      |     |            |
| Remote Display           | 110                   |     |  | 200                      |     |            |
| Other 24V loads          |                       |     |  |                          |     |            |
| TOTAL (mA)               |                       |     |  | TOTAL (mA)               |     |            |
|                          |                       |     | X  |                          |     |            |
| STANDBY HOURS            |                       |     |  | ALARM HOURS              |     |            |
|                          |                       |     | =  | X 1.06                   |     |            |
| STANDBY CAPACITY (mA Hr) |                       |     |  | ALARM CAPACITY (mA Hr)   |     |            |
|                          |                       |     |  |                          |     |            |
|                          |                       |     | TOTAL CAPACITY =<br>STANDBY + ALARM<br>(mA Hr) |                          |     |            |
|                          |                       |     | DIVIDE BY 1000                                 |                          |     |            |
|                          |                       |     | MULTIPLY BY BATTERY<br>FACTOR 1.25             |                          |     | <b>AHr</b> |

Table 3: Calculations to determine the battery backup requirements

## 9 Installation

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### 9.1 Procedure (Check before commencing)

---

**Caution:** The VESDA Exd unit is heavy and requires special consideration when choosing a mounting location and type of wall attachment. It should only be installed with the assistance of lifting equipment in a location deemed suitable by a structural engineer.

---

- (a) Do not install your VESDA Exd if there are any signs of shipping damage to the product. Inform your distributor if there is any damage.
- (b) The detector mounting should be located in a position that is approved by a structural engineer due to its weight.

**Hint:** Be aware that the inlet and outlet flame arrestors are horizontally offset with respect to each other (See **Figure 5**).

- (d) Ensure there is 150mm of clear space around the air inlet pipe and cable entry points to allow for pipe and conduit entry.
- (e) Verify that the Exd enclosure cable entry points and the sampling air pipe inlet are at the correct locations.
- (f) With the aid of lifting equipment, locate the unit at the mounting point and attach securely.
- (g) Terminate the sampling air pipe to the INLET flame-arrestor gland and the exhaust pipe to the OUTLET flame-arrestor gland. Refer to Section 9.2 for flame-arrestor termination
- (h) Insert the power and VESDAnet cables through the appropriate cable glands on the side of the unit and terminate the wiring. Refer to Section 9.3.3 *et al* for termination and wiring details. Tighten the cable gland nuts.

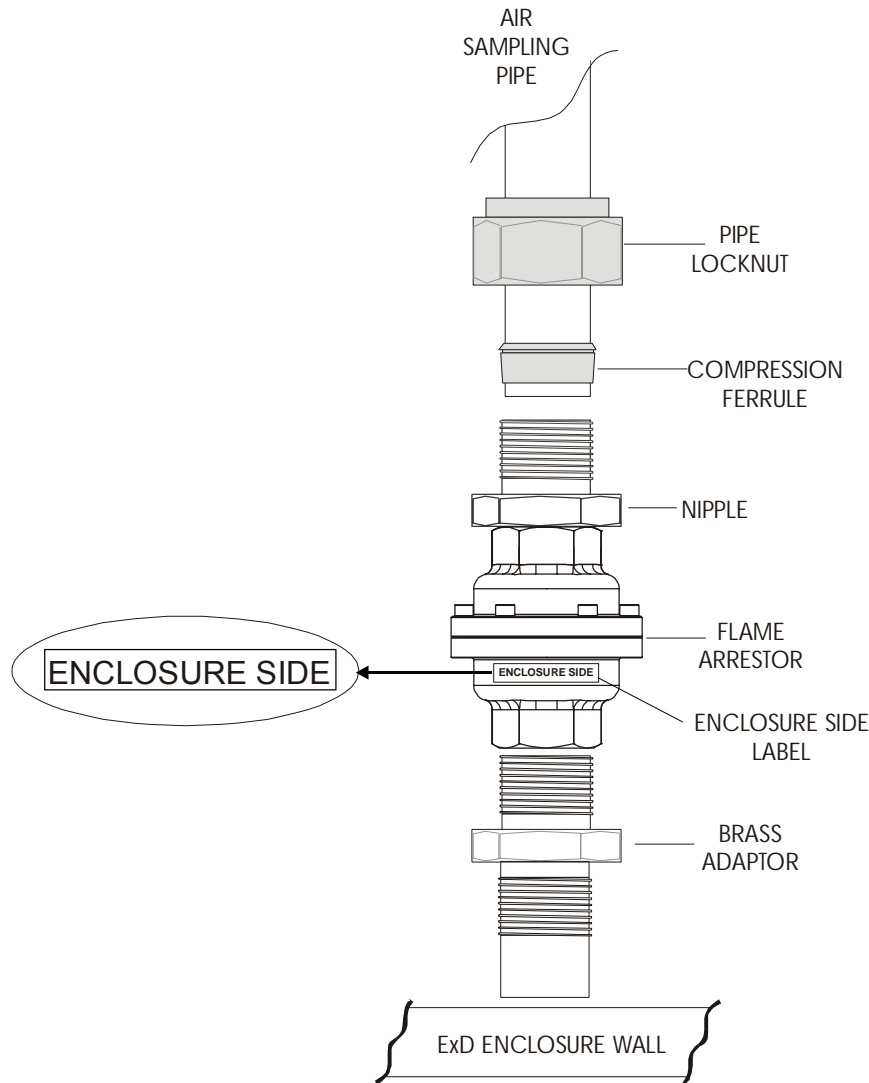
### 9.2 Connecting the Air Sampling and Exhaust Pipes

The VESDA Exd is supplied with the detector unit already fitted inside the explosion proof enclosure. The installation will require the air sampling pipes to be fitted to the flame arrestor.

The air inlet and exhaust glands are designed to fit a standard pipe of 25mm (1in) OD.

Refer to for details of the flame arrestor gland connection.

- De-burr and square off the end of the air sampling and air exhaust pipe. Ensure the pipe end is free from swarf.
- Slip the Locknut and the Compression Ferrule over the air-sampling pipe (check for correct orientation).
- Insert the pipe into the flame-arrestor gland body ensuring a firm fit.
- Ensure that the Flame Arrestors are fitted in the correct direction.
- Slide the compression ferrule and the locknut down into the gland body and tighten the locknut until the ferrule is compressed completely onto the pipe. (Hint: the pipe can be removed to check that the ferrule is seated tightly and cannot be moved).
- Re-insert the pipe into the gland body and re-tighten the locknut to 40N-m (30 Ft-lbs).



**Figure 9: Flame Arrestor Pipe Assembly**

|                |  |
|----------------|--|
| <b>Caution</b> | <b>DO NOT GLUE THE AIR INLET OR EXHAUST PIPE CONNECTION!</b><br>Glued connection makes disconnecting the sampling air pipe from the detector for maintenance extremely difficult and will result in damage to the equipment. |
|----------------|--|

### 9.3 Detector Cabling Requirements

The terminals on the termination card in the detector will accept wire sizes up to 2.5sq mm (12 AWG).

#### 9.3.1 Power Cables

Use the power ratings given in Table 1 for detector specifications to determine the required wire sizes.

#### 9.3.2 Data Cables

The recommended RS 485 data cable for interconnecting to other detector units on the VESDA<sub>net</sub> loop is Belden 9841 (or equivalent). The cable characteristics are as follows:

- 24 AWG, Twisted pair, Shielded, 120 ohms impedance

**NOTE: The maximum specified length for the RS485 cable between any two devices on the VESDA<sup>net</sup> network is 1300m (4000ft). For use of alternate cables, call your regional VESDA Technical office.**

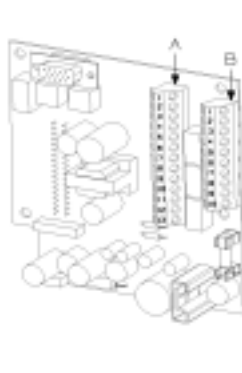
### **9.3.3 Cabling Glands**

4 x M25 holes factory pre-drilled to suit Exd-approved cable glands (not supplied). Unit shipped with Exd blanking plugs only. Choose appropriate Exd-approved gland sizes to suit cable types.

### 9.3.4 Cable Installation

- Select the appropriate Gland Holes and remove the relevant Blanking Plugs on both enclosure and the detector.
- Install cable glands into each gland hole. The glands must be Exd-approved and chosen to fit the cable sizes.
- Run the wires through the glands and into the VESDA Exd enclosure. Terminate wires onto the appropriate terminal blocks.
- Tighten the cable gland locknut to approximately 50 N-m (37 Ft-lbs) to secure the connection.

**IMPORTANT:** Selection and installation of cables and glands must conform to relevant standards and local wiring codes for explosion proof and hazardous environments.



| Terminal A |                | Terminal B |                |
|------------|----------------|------------|----------------|
| 1          | Bias (-) (GND) | 1          | Shield         |
| 2          | Reset (-)      | 2          | VESDAnet A (-) |
| 3          | Reset (+)      | 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)     |            |                |
| 12         | FAULT (C)      |            |                |
| 13         | FAULT (NC)     |            |                |

Figure 10 Terminal Pins Location on Termination Card

## 9.4 Accessing the Aspirating Smoke Detector

The VESDA Exd unit comprises two sections; 1) the explosion proof enclosure and 2) the aspirating smoke detector unit.

Access to the VESDA smoke detector must be made by first unsealing the explosion proof enclosure's door.

---

**Warning:** This action will disable the enclosure's protective properties. Before opening the VESDA Exd enclosure, ensure that the protected area is completely free of explosive gases and that proper authority has been granted to access the unit and that compliance to all required safety procedures is undertaken. All electrical power must be disconnected from the unit before opening the enclosure.

---

- Use a 6mm hex Allen key to undo the twenty (20) screws securing the enclosure door to access to the detector. Rotate screws anti-clockwise to undo.
- Release the two Philips head screws located on the left and right hand sides of the front cover.

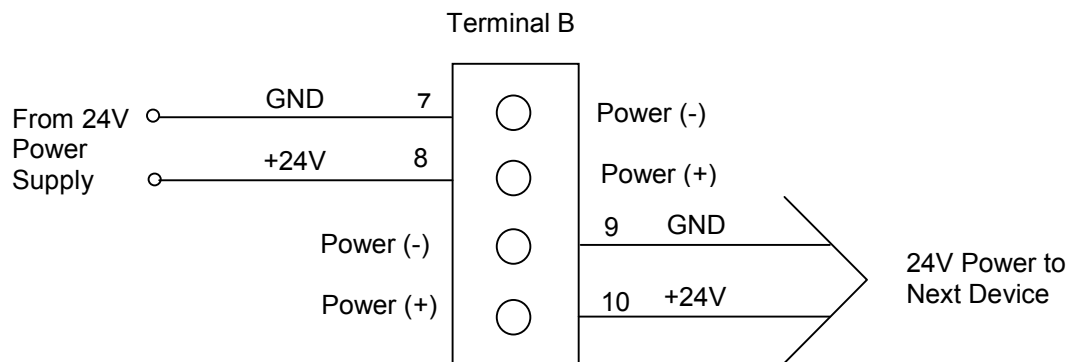
## 9.5 Procedure to Terminate Wires

Use the appropriate wiring standards for your country or use the following suggested procedure listed below.

- (a) Strip off 5 to 10mm of outer insulation from each wire.
- (b) Twist wire strands together for multi-stranded wire only.
- (c) Insert wire into terminal and tighten.
- (d) Check the wire is firmly attached to the terminal.
- (e) Ensure no bare wires are exposed at the terminals. The wire insulation must reach to the end of the terminal.
- (f) Check the terminations are correct by referring to the appropriate circuit diagrams in this manual.

## 9.6 Terminating the Power Wires

- a) Refer to Figure 11 for the power terminals location on the termination card.
- b) Connect the power wires to the Power terminals as shown in Figure 11.

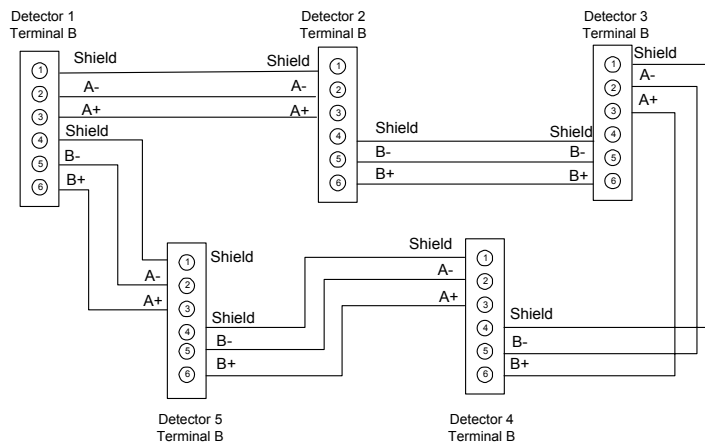


**Figure 11 Wire Connection Details for Power**

## 9.7 Connecting the VESDAnet Wires to the Termination Card

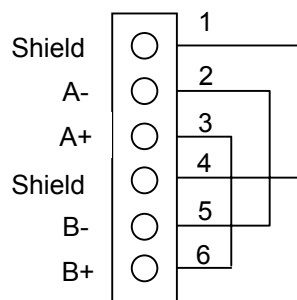
- Refer to Figure 10 for the network terminals location on the termination card.
- Connect the VESDAnet wires as shown in Figure 12. This diagram is only an example for five detectors. This wiring method is similar for two or more detectors.
- Maintain the wiring polarity throughout the network and **do not leave any VESDAnet terminals unconnected**.

**NOTE:** While an Open Loop configuration is possible (refer to System Design Manual), it is strongly recommended that the Closed Loop configuration be installed to achieve a fault tolerant loop



**Figure 12 Wire Connection Details for VESDAnet**

**NOTE:** When used as a stand-alone detector the VESDAnet terminals must be wired as per Figure 13.



**Figure 13 Wire Connection Details for VESDAnet Loop (standalone)**

## 9.8 Terminating the Auxiliary Wires

- a) Refer to Figure 14 for the Reset, LED and Bias terminals on the termination.
- b) The functions for these outputs are as follows:
  - LED +/-** This output terminal provides a maximum of 5VDC, 15mA via a 220-ohm resistor to power a remote LED.
  - Bias +/-** This output provides a 10VDC supply via a 1K-ohm resistor to power the remote Reset/Isolate switch when connected as per Figure 14.
  - Reset +/-** This input terminal can provide one of three functions, (**Mains OK, Standby or Reset**) and requires an input voltage supply between 5V to 24VDC to operate.
- c) Terminate the RESET, LED and Bias wires as per your site requirements or with reference to Figure 14.

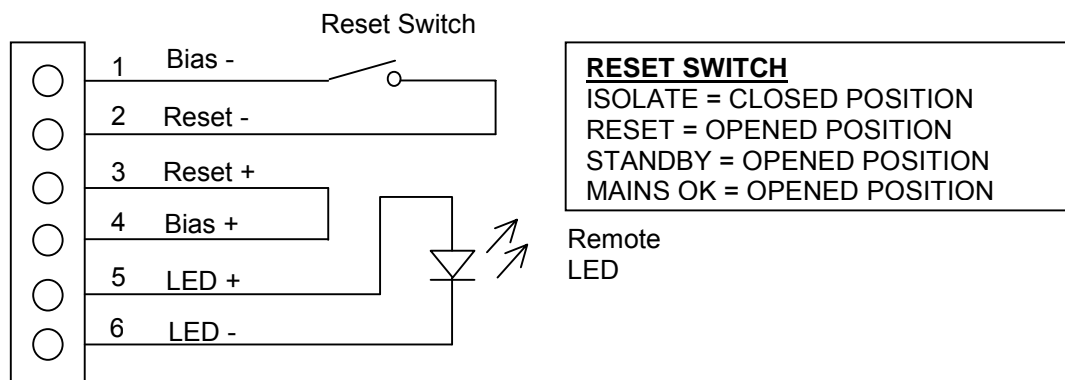


Figure 14 Wire Connection Details for Auxiliaries

## 9.9 External Pipe Bonding Check

- a) Check all the external sampling plastic pipe connecting joints are fully sealed and bonded with glue to eliminate unwanted air leaks. If applicable, check all metal pipe joints are sealed to eliminate unwanted air leaks.
- b) Check the pipe joint at the air inlet to the VESDA detector is **not** bonded and is fitted correctly into the air inlet gland.
- c) Check all pipes are securely attached to a mounting surface with the proper fasteners.
- d) Check the number and sizes of the sampling air holes on the pipes are correct.
- e) Check the routing of the pipes is correct with reference to the site plan.



## 9.10 Power Up the System

---

**Caution** Powering up the system must be done by VESDA accredited personnel.

---

- (a) Remove the 1.6A fuse on the termination card.
- (b) Turn on the power to the detector.
- (c) Check the DC voltage at the **Power** terminals on the termination card is between **18 VDC to 30 VDC**. Disconnect the power immediately if the supply voltage is above **30VDC** or less than **18VDC** and troubleshoot the fault.
- (d) Replace the fuse when the measured voltage is OK. The system takes approximately 15 seconds to power up during which time an LED test sequence is performed.
- (e) If the system fails to power up:
  - Check all the power wires are securely connected to the Power terminals.
  - Check the polarities of the power wires are correctly terminated.
  - Check for a blown fuse on the termination card. Refer to Figure 3 for the fuse location.

**Note:** The detector may show faults immediately after power up and this is normal. Reset the unit by pressing the **RESET** switch on the front cover of the detector to unlatch the relays and fault lights. The fault light on the front cover will light up and this is normal.

## 9.11 Closing up the VESDA Exd™ enclosure

- a) Perform the **Power Up** and **Preliminary Checks**.
- b) Re-attach the front cover of the LaserCOMPACT unit to the plastic tie and connect the **LED CARD** connector to the socket on the termination card.
- c) Close up the VESDA Exd and secure the enclosure cover with the twenty screws.

---

**Warning:** For the VESDA Exd enclosure to meet the “Exd IIB T6” compliance requirements, the twenty (20) cover screws must be correctly and evenly tightened. Use a suitable torque wrench to set each screw to approximately 40N-m (30 ft-lb) torque.

---

## 9.12 Installation Checklist

**Site Name:** .....

**Zone:** .....

**Detector Serial Number/s:** .....

Perform the following checks listed below to ensure that all the necessary items are completed before handing over to a commissioning engineer.

| INSTALLATION CHECKS  | Yes                      | No                       |
|--|--------------------------|--------------------------|
| 1. Was the VESDA Exd detector received intact?   | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Have the sampling and exhaust air pipes been connected correctly to the flame arrestors and not glued?                            | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Have the power wires been connected to the correct terminals on the termination card?   | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Have the alarm signalling cables been terminated to the correct terminals on the termination card?                                | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Have the VESDA <sup>net</sup> cables been connected to the correct terminals on the termination card? (if applicable)             | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Are both of the Flame Arrestors correctly orientated? Check the label for the correct enclosure end.                              | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. If the Flame Arrestors have been disturbed since leaving the factory, have they been re-tightened to the specified torque? (80Nm) | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Are the Cable Gland locknuts tightened to the specified torque? (40Nm)  | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Are the unused holes on the Exd enclosure plugged to the specified torque? (40Nm)   | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Are all front cover bolts tightened to the specified torque? (40Nm)  | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Has the Basic Pass/Fail smoke test been performed? (see Section 11.4)  | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Is the air sampling pipework installed and checked as per the site plans?  | <input type="checkbox"/> | <input type="checkbox"/> |

If you have selected NO for any option above, please contact your local Vision Fire & Security office.

Installation of your VESDA Exd is now complete.

**Name of Installer:** .....

**Signature:** .....

**Date:** .....

## 10 Factory Default Settings

### 10.1 Factory Default Settings

The VESDA Exd is shipped from the factory with the default settings as per Table 4. Only authorized personnel at the Administrative (ADM) or Distributor (DST) level may alter these values using the appropriate PIN.

#### 10.1.1 Factory Default User Access Levels

The factory set default access levels are User (USR), Administrator (ADM) and Distributor (DST). Each level requires a four-digit PIN number to be entered before gaining access to the detector. The user may add, alter, delete or modify user names and PIN's after having gained access into the system. Up to 10 Users and 4 Administrators may be added.

#### 10.1.2 Factory Default PIN Numbers

The factory default Personal Identification Numbers (PIN) are distributed to authorized personnel attending accredited VESDA training courses and may be altered after gaining access into the system.

| Parameter  | Default Value                         | Minimum Access Level     |
|--|---------------------------------------|--------------------------|
| Action Threshold   | 0.14% obs/m (0.044% obs/ft)           | Adm                      |
| Airflow...High Urgent  | 130%                                  | Adm                      |
| Airflow...High Minor   | 120%                                  | Adm                      |
| Airflow...Low Minor  | 80%                                   | Adm                      |
| Airflow...Low Urgent   | 70%                                   | Adm                      |
| Alarm Delays...Pre-Alarm   | 10 seconds                            | Adm                      |
| Alarm Delays...Alert   | 10 seconds                            | Adm                      |
| Alarm Delays...Fire  | 10 seconds                            | Adm                      |
| Alarms Latched   | Latched                               | Adm                      |
| Alert Threshold  | 0.08% obs/m (0.025% obs/ft)           | Adm                      |
| AutoLearn  | 14 days<br>0 Hours<br>0 Minutes       | Adm<br>Adm<br>Adm        |
| Button Lockout...Buttons   | Enabled                               | Adm                      |
| Communications    Open-ended loop<br>Preferred Port<br>Network Delay<br>Health Check | None<br>A<br>15 seconds<br>45 seconds | Adm<br>Dst<br>Dst<br>Dst |
| Delay Times  | Simultaneous/Cumulative               | Adm                      |
| Device ID  | Name/Location                         | Adm                      |

| Parameter                             | Default Value                                  | Minimum Access Level     |
|---------------------------------------|--|--------------------------|
| Event Log to View                     | Smoke Level<br>Alarms<br>Faults<br>User Action | Adm<br>Adm<br>Adm<br>Adm |
| Faults Latched                        | Latched  | Adm                      |
| Filter Service Interval               | 1825 days (5 years)                            | Adm                      |
| Fire Threshold                        | 0.2% obs/m (0.062% obs/ft)                     | Adm                      |
| Full Scale                            | 2.000% obs/m (0.61% obs/ft)                    | Adm                      |
| Instantaneous - Fire                  | Disabled                                       | Adm                      |
| Loop Number                           | 0  | Adm                      |
| Overlay Alert                         | Not Selected                                   | Adm                      |
| Power Supply Zone Number              | 0  | Adm                      |
| Reference Detector...Delay            | 2 minutes                                      | Adm                      |
| Reference Detector...Detector         | 255 = No Reference                             | Adm                      |
| Reference Detector...Dilution         | 100%   | Adm                      |
| Smoke Change...Change By              | 0.02% obs/m (0.0062% obs/ft)                   | Adm                      |
| Smoke Change...Min Interval           | 2 seconds                                      | Dst                      |
| UL Flag restricting maximum Threshold | Set  | Adm                      |
| Units                                 | SI   | Adm                      |
| Zone Name/Location                    | Blank  | Adm                      |
| Zone Number                           | 0  | Adm                      |

Table 4 Detector Default Values

## 10.2 Alarm Threshold Settings

|                 | Alarm Threshold Settings |          | UL Alarm Threshold Settings |          |
|-----------------|--------------------------|----------|-----------------------------|----------|
|                 | % obs/m                  | % obs/ft | % obs/m                     | % obs/ft |
| Alert (min)     | 0.005                    | 0.0015   | 0.005                       | 0.0015   |
| Alert (max)     | 1.990                    | 0.6218   | 1.990                       | 0.6218   |
|                 |                          |          |                             |          |
| Pre-Alarm (min) | 0.010                    | 0.0031   | 0.010                       | 0.0031   |
| Pre-Alarm (max) | 1.995                    | 0.6234   | 1.995                       | 0.6234   |
|                 |                          |          |                             |          |
| Fire (min)      | 0.015                    | 0.0046   | 0.015                       | 0.0046   |
| Fire (max)      | 20.0                     | 6.25     | 12.8                        | 4.0      |

**Table 5 Detector Default Alarm Thresholds**

**UL Specs:** To meet UL specifications, Any alarm thresholds (signal) that initiates an evacuation procedure via the Fire Alarm Panel must not be set higher than 0.625%/ft.

# 11 Preliminary System Checks

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Perform the following preliminary system checks before commissioning.

- (a) Logging onto the system with a PC or a LCD Programmer. See Section 11.1.1
- (b) Normalize the airflow. See Section 11.2
- (c) Basic pass/fail smoke test. See Section 11.4

## 11.1 Logging On to the System

Check with your distributor for the User level and PIN number to log on to the system.

### 11.1.1 Logging On with a LCD Programmer

Connect the programmer lead to either one of the following sockets.

- To the 15 pin, programming socket on the termination card
- OR**
- To a remote VESDA<sup>net</sup> socket within the VESDA<sup>net</sup> loop

Wait for the programmer to power up. Log in your User level and PIN number into the programmer.

### 11.1.2 Logging On with a PC

- a) A **PC-LINK HLI** device must be connected between the PC and the 15-pin VESDA<sup>net</sup> socket to program the detector.
- b) Connect the RS232 data cable from the PC output port to the 9-pin socket on the PC-Link HLI device.
- c) Connect the 15-pin output port of the PC-LINK HLI device to the 15 pins VESDA<sup>net</sup> socket on the termination card in the detector or to any remote VESDA<sup>net</sup> sockets if wired to the detector.
- a) Run the VConfig PRO program from the PC.
- b) Enter your User level and PIN number.

## 11.2 Normalize the Air Flow and Clearing Air Flow Faults

- a) List all the VESDA<sup>net</sup> number for all detectors to be normalized.
- b) Go to section 10.2.1 for LCD programming or section 10.2.2 for PC programming.
- c) It takes approximately 11 minutes for the system to normalize during which time the Green OK LED flashes twice every second to indicate that normalization is in progress.
- d) Check the airflow level is approximately 100% when normalization is completed.
- e) Press the Reset/Isolate button on the front cover to reset the detector after Normalization. All the fault lights should go off. If any of the fault lights are lit consult the Status menu on the programmer or the Active Event List on the VConfig PRO program to determine the faults and consult your system design manual to rectify.
- f) If the unit fails to normalize it is because the measured airflow may be too low. Check for blockages in the sampling air pipe and check that the exhaust plug has been removed.

### 11.2.1 Using a LCD Programmer

- a) Select the detector to be normalized from the displayed list of devices.
- b) Select Setup by Zone/Type menu ↵ Normalize ↵ Start ↵ (↵ = Enter Key).
- c) To check the airflow level, go to the Normalize or Status menu after normalizing.

### 11.2.2 Using a PC

- a) From the View menu select Device List.
- b) Select the detector to be normalized from the displayed list of devices.
- c) From the Device menu, select Normalize Air Flow and press Y to start the function.
- d) To check the airflow level, select the Current Flow command under Device menu after normalizing.

## 11.3 VESDAnet Communication Check

**Note:** This test verifies the VESDAnet system is functioning and all devices connected on VESDAnet are communicating.

- a) List all VESDAnet number for all devices connected onto the communication loop.
- b) Go to section 8.3.1 for LCD programming or section 8.3.2 for PC programming.
- c) Verify the VESDAnet number for each device on the network is shown on the list.
- d) If there are some devices not found on the display list check the VESDAnet cabling to all the devices are correct.

### 11.3.1 Using LCD Programmer

- a) Go to Show Wiring Order menu and press ↵.
- b) Check the displayed list shows all the connected devices and the VESDAnet number for each device is correct.
- c) Check for any devices not connected and troubleshoot if necessary.

### 11.3.2 Using a PC

- a) Select Device list from the View menu.
- b) Check the displayed list shows all the connected devices and the VESDAnet number for each device is correct.
- c) Check for any devices not connected and troubleshoot if necessary.

## 11.4 Basic Pass/Fail Smoke Test

**Note:** This test verifies the detector will sense smoke. It does not replace any appropriate commissioning test.

- (a) Isolate the detector by pressing the Reset key for more than 2 seconds.
- (b) Check the Reset/Isolate LED lights up.
- (c) Inject smoke into any sampling air hole from a smoke pellet or other designated test device

**NOTE: Do not use aerosol smoke cans, as it will degrade the flame arrestor**

- (d) Wait for one of the red LED's on the front panel to light up.
- (e) If the LED does not light up contact a fully trained accredited VESDA engineer.

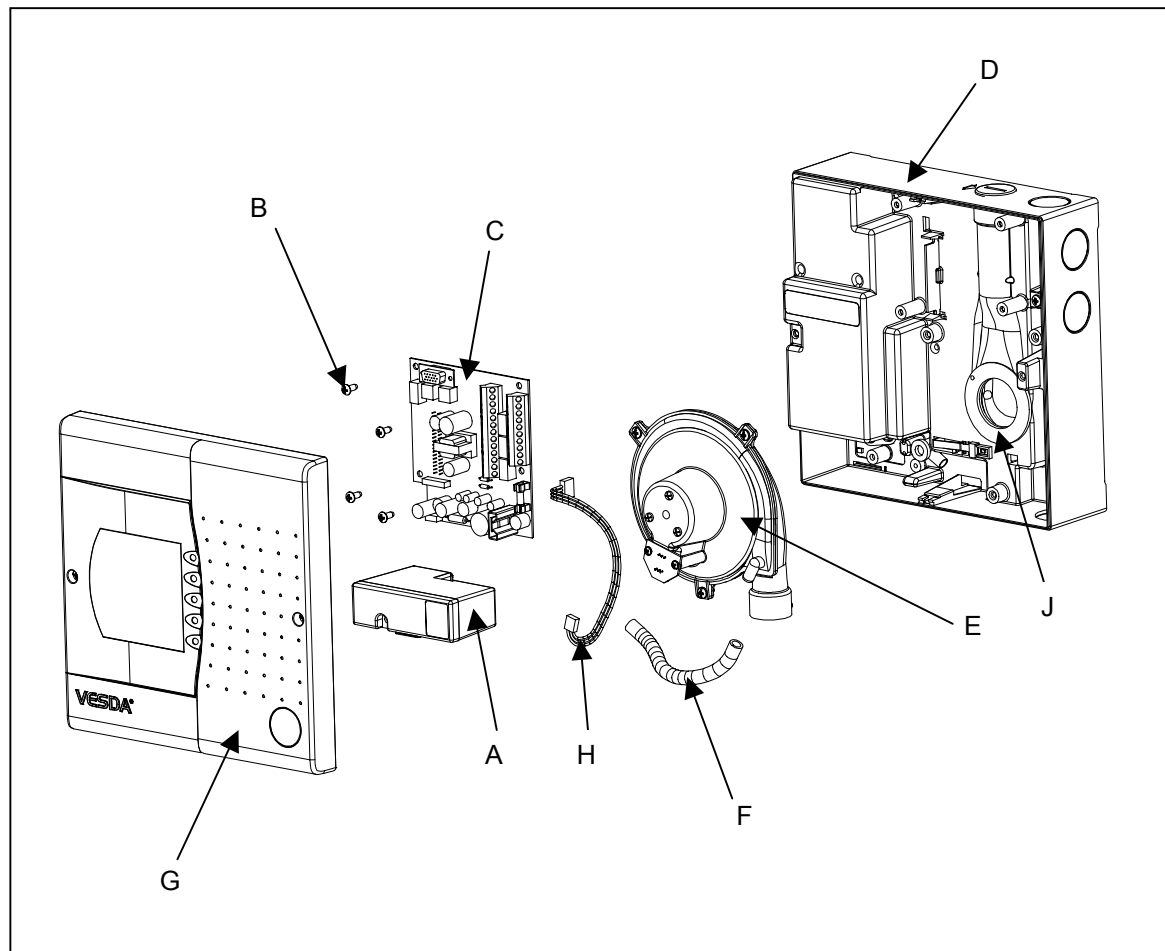
*Reset the detector by pressing the Reset switch once when the smoke test passes.*

## 12 Service and Maintenance

**NOTE:** The VESDA LaserCOMPACT VLC-Exd detector has been specially modified for use in the Exd enclosure. The standard VLC-505 is not suitable for installation in the Exd enclosure.

**WARNING:** Power **MUST BE** disconnected to the VESDA Exd detector before removing the front cover.

### 12.1 Aspirating Smoke Detector



- A) Air Filter Cartridge
- B) Termination Card Screws (4)
- C) Termination Card
- D) Main Enclosure
- E) Aspirator
- F) Sample Air Hose
- G) Front Cover
- H) Aspirator Cable Loom
- J) Manifold Outlet Flange

**Figure 15 Exploded view of the detector**



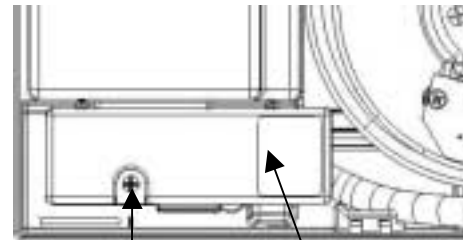
## 12.2 Replacing the Air Filter Cartridge

### Disassembly

1. Locate the air filter cartridge (A) inside the detector compartment.
2. Undo the recessed Philips head filter screw (B).
3. Lift out the air filter cartridge.

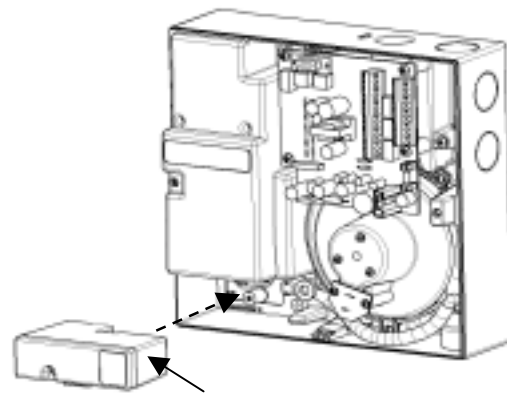
### Assembly

1. Insert a new air filter cartridge (A).
2. Tighten filter screw (B).
3. Reset the filter counter by connecting a LCD programmer or a PC with VConfig Pro software to the programming socket.
4. Using a LCD programmer:
  - a) Enter your user level and PIN number to Log ON to the detector.
  - b) Initiate the New Filter command located under the Filter menu.
5. Using a PC only (Applicable to RO version) or Using a PC with a PC-Link HLI (Applicable to VN version only):
  - a) Enter your user level and PIN number to Log ON to the detector.
  - b) Initiate Reset Filter Settings command located under the Device menu.
6. Close up the detector.



Filter Screw (B)

Air Filter Cartridge (A)

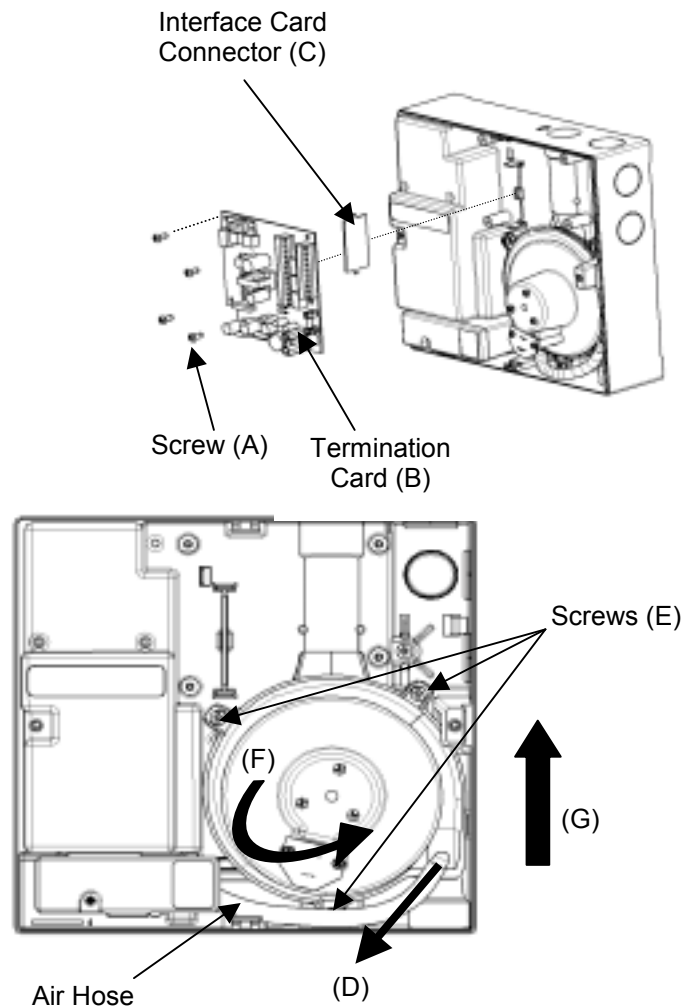


Air Filter Cartridge (A)

## 12.3 Replacing the Aspirator

### Disassembly

1. Remove the four screws (A) securing the termination card.
2. Disconnect the aspirator cable loom from the connector on the aspirator.
3. Gently pull out termination card (B) from interface card (connected behind).
4. Be careful not to dislodge any wires connected to the termination card.
5. Leave the termination card suspended by its wires.



6. Pull off the air hose from aspirator pipe (D).
7. Undo three Philips head screws securing aspirator (E). Screws are captive and do not come off the aspirator.
8. Turn aspirator anti-clockwise (F) using the exhaust port as the pivot point.
9. Push aspirator upward (G) and remove.

### Assembly

1. Check the new aspirator has a gasket on the inlet flange and three attached screws.
2. Wipe manifold outlet flange surface (J) if dirty. See Figure 16.
3. Do the reverse of disassembly.
4. Secure aspirator with three screws (E).
5. **Connect removed air hose** to pipe on aspirator. Ensure a tight fit over the pipe.
6. Insert Termination Card (B) into interface card (C).
7. Secure the termination card with four screws (A).
8. Connect aspirator cable connector to socket on aspirator. Connector is polarized and can only be inserted one way.
9. Check all wires are secured to its connectors or terminals.
10. Power ON the detector and check the aspirator is running.
11. Close up the detector.

## 12.4 Removing and replacing the detector in the Exd enclosure

To remove the detector from the Exd enclosure:

- Remove the flexible pipes from the air inlet and the exhaust ports.
- Disconnect power and VESDAnet cables.
- Slide the Detector upwards until it slides off the mounting bracket tabs.

To replace the detector in the Exd enclosure:

- Slide the Detector downwards until it slides onto the tabs.
- Connect the flexible pipes to the air inlet and the exhaust ports.
- Reconnect power and VESDAnet cables.

**NOTE:** For a replacement detector, please order VSP-405.

## 12.5 Cleaning and Replacement of the Flame Arrestor Element

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**WARNING: Power MUST BE disconnected to the detector before removing the VESDA Exd front cover.**

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The in-line deflagration flame arrestors should be visually inspected on a regular basis to ensure that no build-up of solids or liquids occurs in the element and that there are no signs of corrosion.

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**WARNING: The maintenance interval must be determined by the user and is governed by the amount and type of particulates in the system where the unit is installed. The user should visually check the element in the first few months of operation to determine how quickly particulates are accumulating.**

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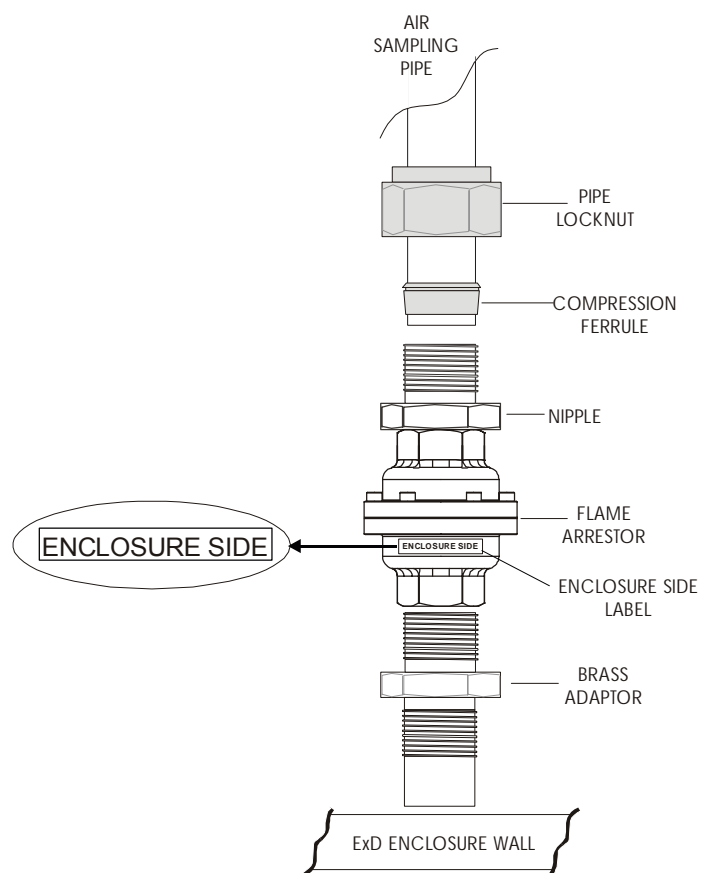
Cleaning or replacement of the element should be undertaken with care and components must be replaced as originally fitted to provide unrestricted airflow and to prevent leakage of gasses.

- Remove the Flame Arrestor from the enclosure.
- Undo the 6 bolts and remove the top housing.
- Hold a light source behind the element to aid in visual verification of element contamination.
- Clear Flame outer elements. Dry particles may be blown out by compressed air. In case of heavy, sticky contamination within the Flame Arrestor elements, soak the elements in solvent for sufficient time and blow with compressed air until completely dry.
- If after cleaning more than 30% of contamination still remains in the element gaps replace the flame Arrestor (Spare Part Number VSP-400 which is a single quantity item).
- Ensure that both of the Flame Arrestors are correctly orientated as depicted on the 'Enclosure Side' label.
- This also applies in case of corrosion or tarnish occurring due to flash back.

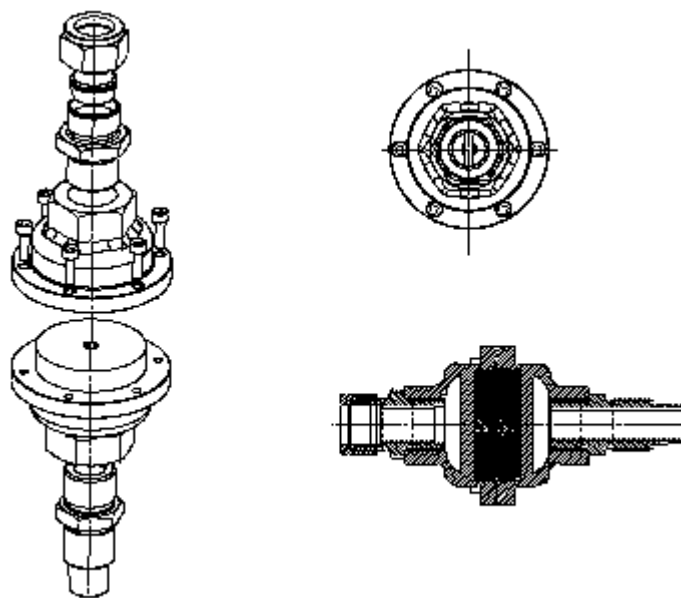
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**WARNING: No smoke spray or spray of any hydrocarbon can be used to test for smoke in flame Arrestor.**

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**Figure 16: Replacing Flame Arrestor**



**Figure 17 Exploded views of the Flame Arrestor**

## 12.6 Spare Part Numbers

VESDA VLC VN Exd Detector: VSP-405

VESDA Exd Flame Arrestor Assembly: VSP-400

Both of the above spare parts consist of one part each.



## **Summary of VESDA® Product Warranty Conditions**

**Capitalized terms below are defined in the General Terms and Conditions. You acknowledge that this is a summary of warranties and you have read and agree to the General Terms and Conditions.**

Vision Fire & Security warrants that the VESDA® Product will conform to its Specifications and perform its designed function during the Warranty Period.

Vision Fire & Security also warrants that any component part of the VESDA® Product serviced or repaired by its authorized service department will remain in good working order for a period of 24 (twenty-four) months from the date of service. This warranty is only available on component parts of the VESDA® Product while the VESDA® Product is less than 7 (seven) years old commencing on the start of the Warranty Period and only covers those component parts of VESDA® Product serviced, repaired or replaced.

If you notify Vision Fire & Security that the VESDA® Product, or component part of the VESDA® Product, under the warranty provided in clause 1.1 or 1.2 of these Conditions of use for the VESDA® Product, do not meet the Specification or perform its designed function respectively, Vision Fire & Security will, at its option, either repair or replace the VESDA® Product or its component parts at no additional charge.

Component parts and replacement VESDA® Products will be furnished on an exchange basis and will, at the option of Vision Fire & Security either be new, equivalent to new or reconditioned. All replaced component parts and VESDA® Products become the property of Vision Fire & Security.

Vision Fire & Security does not warrant, guarantee or make any representations, either expressly or implied, regarding the current or future use, or the results of the use, of the VESDA® System, with respect to its correctness, accuracy, reliability, completeness, interworking, functionality, currentness or otherwise resulting from the configuration of the VESDA® System.

You acknowledge that no oral or written information, representation or advice given by or on behalf of Vision Fire & Security or its representatives, other than as contained in the General Terms and Conditions, creates a warranty or in any way increases the scope of these General Terms and Conditions, and you agree that you have not relied on any such information, representation or advice.

The warranties contained in the General Terms and Conditions do not cover and, to the extent permitted by law, Vision Fire & Security has no liability with respect to damage to or arising out of, or the condition or performance of, the VESDA® System resulting from negligence or improper use, storage, installation, configuration or handling of the VESDA® System (where 'improper' includes treatment other than in accordance with the VESDA Manual, these terms and conditions or the information provided at a training session); or accident, unforeseeable circumstances or disaster; or modifications to the VESDA® System other than in accordance with Vision Fire & Security' instructions; or attachment of or interoperation with features, software or products not approved by Vision Fire & Security in writing; or where the VESDA® System has been serviced by persons not authorized by Vision Fire & Security in writing to service the VESDA® System.



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