Xtralis VESDA VLP

Product Guide

xtralis

VESDA

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(ii) in the case of goods, the lowest cost of replacing the goods, acquiring equivalent goods or having the goods repaired.

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Document Conventions

The following typographic conventions are used in this document.

Convention	Description
Bold	Used to denote: emphasis Used for names of menus, menu options, toolbar buttons
Italics	Used to denote: references to other parts of this document or other documents. Used for the result of an action.

The following icons are used in this document

Convention	Description
	Caution: This icon is used to indicate that there is a danger to equipment. The danger could be loss of data, physical damage, or permanent corruption of configuration details.
	Warning: This icon is used to indicate that there is a danger of electric shock. This may lead to death or permanent injury.
	Warning: This icon is used to indicate that there is a danger of inhaling dangerous substances. This may lead to death or permanent injury.

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Codes and Standards Information for Air Sampling Smoke Detection

We strongly recommend that this document is read in conjunction with the appropriate local codes and standards for smoke detection and electrical connections. This document contains generic product information and some sections may not comply with all local codes and standards. In these cases, the local codes and standards must take precedence. The information below was correct at time of printing but may now be out of date, check with your local codes, standards and listings for the current restrictions.

FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, the user is encouraged to try to correct the interference by one or more of the following measures; re-orientate or relocate the receiving antenna, increase the separation between the equipment and receiver, connect the equipment to a power outlet which is on a different power circuit to the receiver or consult the dealer or an experienced radio/television technician for help.

FDA

This VESDA product incorporates a laser device and is classified as a Class 1 laser product that complies with FDA regulations 21 CFR 1040.10. The laser is housed in a sealed detector chamber and contains no serviceable parts. The laser emits invisible light and can be hazardous if viewed with the naked eye. Under no circumstances should the detector chamber be opened.

FM Hazardous Applications

3611 Hazardous Approval Warning: Exposure to some chemicals may degrade the sealing of relays used on the detector. Relays used on the detector are marked "TX2-5V", "G6S-2-5V" or "EC2-5NU".

VESDA detectors must not be connected or disconnected to a PC while the equipment is powered in an FM Division 2 hazardous (classified) location (defined by FM 3611).

FM Approved Applications

The product must be powered from VPS-100US-120, VPS-100US-220 or VPS-220 only.

ONORM F3014

ONORM F3014, transport times for all tubes (including capillaries) must not exceed 60 seconds from any hole. This means that the pre-designed pipe networks that include capillaries cannot be used.

AS1603.8

The performance of this product is dependent upon the configuration of the pipe network. Any extensions or modifications to the pipe network may cause the product to stop working correctly. You must check that ASPIRE2 approves alterations before making any changes. ASPIRE2 is available from your VESDA ASD distributor.

AS1851.1 2005

Maintenance Standards. Wherever this document and the AS1851.1 differ, AS1851.1 should be followed in preference to this document.

European Installations

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

Regional Regulatory Requirements and Notices

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.

EN54-20

The product must use a power supply conforming to EN 54-4.

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 ASPIRE2 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 ASPIRE2 should be in the range 20 to 115 lpm

Additional information:

• Class A detectors passed EN 54-20 approvals testing with 30 holes and 0.05% obscuration/m detector sensitivity
• Class B detectors passed EN 54-20 approvals testing with 60 holes and 0.06% obscuration/m detector sensitivity
• Class C detectors passed EN 54-20 approvals testing with 100 holes and 0.08% obscuration/m detector sensitivity

Approvals

- UL
- ULC
- FM
- LPCB
- VdS
- CFE
- ActivFire
- AFNOR
- VNIIPO
- CE - EMC and CPD
- EN 54-20

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

Contents

1   Scope

The Xtralis VESDA VLP Product Guide is written to provide you with comprehensive knowledge of the detector.

This guide introduces you to the VLP features, technical specifications and gives an understanding of its components and their function. You will also find instructions on installing, cabling and powering up the detector.

This guide is for anyone involved with the design, maintenance and purchasing of an Xtralis VESDA system. It is assumed that anyone using this manual has knowledge and the appropriate certification from the local fire and electrical authorities.

2   Introduction to the VLP

The VLP is an aspirating smoke detector providing very early warning of fire conditions by drawing air samples through an air sampling pipe network. The detector chamber can detect presence of smoke at very low concentrations. The embedded and PC software complimenting the VLP provides a wide range of user defined parameters and reporting capabilities. The detector easily interfaces with fire warning and fire suppression release systems, and can be easily integrated into a building management system.

VLP Features

The VLP features make it a versatile smoke detection product:

- Each detector can cover an area up to 2,000 m^2 (20,000 sq. ft.)
- Wide sensitivity range
- Four programmable alarm thresholds
- AutoLearn feature
- Four pipe Inlets
- Individual pipe flow monitoring
- Replaceable air filter cartridge
- Option for inverted mounting
- Recessed mounting option
- Modular to meet site specific requirements
- Modular Display Module and LCD Programmer
- Seven programmable relays
- High efficiency aspirator
- Programmable general purpose Input
- PC capable programming and monitoring
- Multilingual displays
- Event log for up to 18,000 events

3   Operation of the VLP

An air sampling pipe network collects air samples from a protected area. The Xtralis VESDA integrated aspirator draws air into the sampling pipes through a pipe inlet manifold (up to four pipes can be connected to a VLP detector). For further information on air sampling pipe networks please see the Pipe Network Design and Installation Manuals.

Some of this air flows to the dual stage filter. The first stage air filter removes dust and dirt from the sampled air and flows to the laser detector chamber to detect the presence of smoke.

Any smoke detected in the laser detection chamber is signaled to the main processor card. If the presence of detected smoke is higher than the set thresholds it is reported as an alert, action, fire 1 or fire 2 alarm depending upon the alarm thresholds. The second stage filter further filters the air to produce ultra clean air. The ultra clean air is used to clean the optical surfaces in the laser detection chamber.
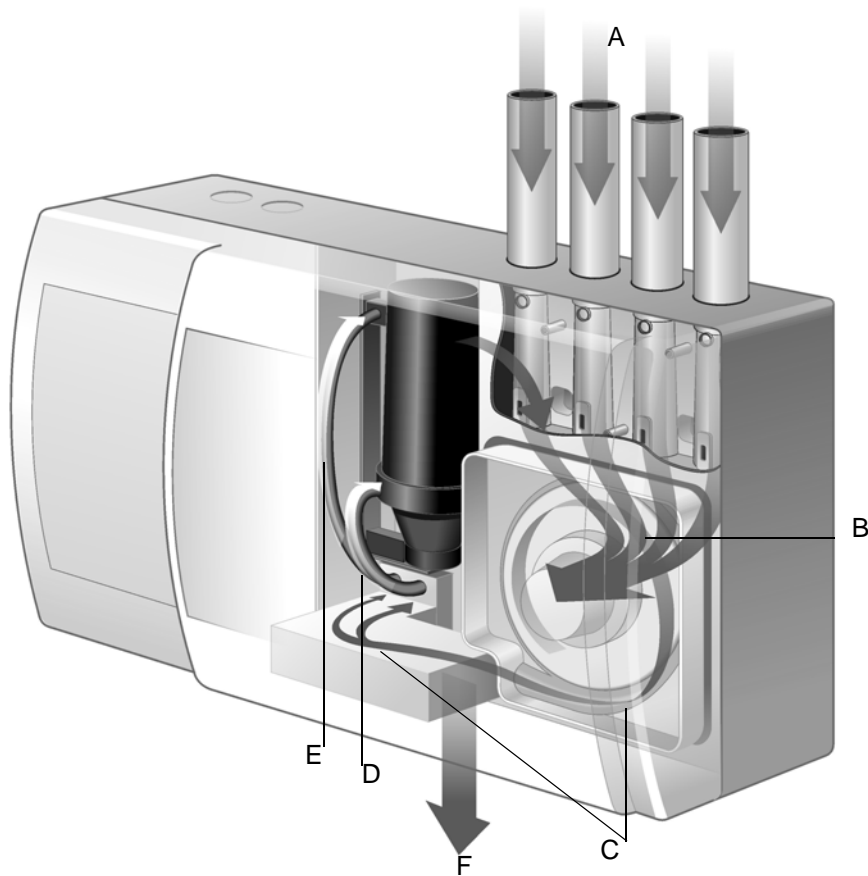
Legend	
A	Air inlets from pipe networks
B	Air is drawn into the aspirator
C	Some air is filtered and:
D	flows into the chamber for testing
E	is filtered a second time, then used to flush the chamber with ultra clean air
F	All air is then vented

Figure 1 - Operation and internal air flow of a VLP

VLP Configurations

The modular options available with a VLP are:

- Fire and OK LEDs (FOK)
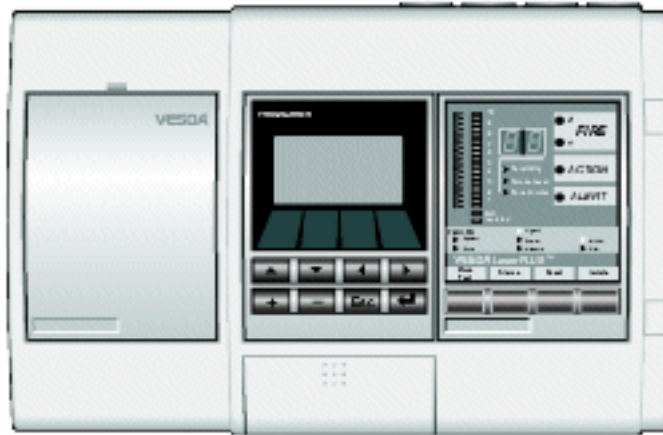- LCD Programmer
- VLP Display Module

Figure 2 - VLP-012 installed with LCD Programmer and Display Module

Display module

The VLP Display Module is mounted either on the detector front cover or at a remote location in a remote mounting box or a 19" subrack. It provides a visual representation of the smoke levels and the four alarm stages for the assigned detector. An array of fault LEDs illuminate in different configurations to report Urgent, Minor, Zone and System faults. Up to 20 Display Modules can be assigned to one detector, however the Display Module can be configured to report the status of only one detector at a time.
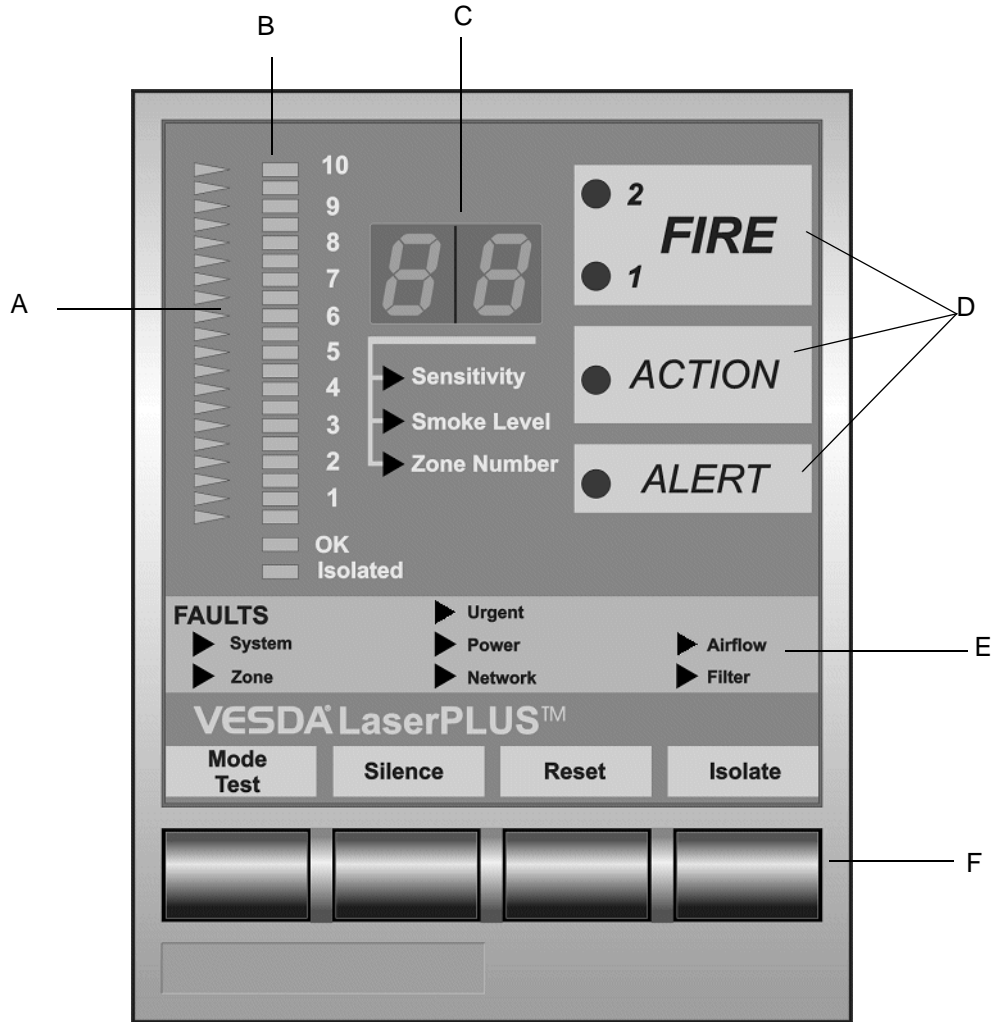
Legend	
A	Alarm Threshold Indicators
B	Bar graph of detected smoke
C	Numerical Display
D	Alarm LEDs
E	Fault LEDs
F	Push Button Keys

Figure 3 - Display Module for VLP

OK LED

The OK LED stays illuminated during normal operation indicating the unit is functioning normally. When this LED is off a warning beep sounds, indicating a Fault condition is active.

Isolate LED

This LED is illuminated when the detector is Isolated and relays are de-activated disabling alarm outputs of the detector. The display can be programmed to beep every 60 seconds.

Alarm Levels

ALERT: When illuminated this LED indicates that the smoke level is above the alert threshold. This means the detector has identified very early stages of a fire condition and/or that the smoke level in the area is above normal.

● *ALERT*

ACTION: When illuminated this LED indicates that the detected smoke level has passed the threshold value fixed for Action, but is not intended to initiate a general fire alarm response procedure.

● *ACTION*

FIRE 1: When illuminated this LED indicates that the detected smoke level is above the threshold value set to initiate a general fire alarm response procedure. This indicates a fire may be imminent or is in progress. When interfaced with a Fire Alarm Control Panel (FACP) it can generate an automatic fire alarm.

● *2*
FIRE
● *1*

FIRE 2: When illuminated this LED indicates a fire is in progress. The detector can be interfaced with an FACP to activate automatic suppression systems and evacuation procedures.

Bar graph

The Bar graph is a 20 step indicator where each indicator represents an increase in the detected level of smoke, relative to the preset fire alarm level.

Threshold Indicators

The illuminated LEDs represent visual settings for ALERT, ACTION, and FIRE 1 alarm levels. The FIRE 1 indicator is always at the top.

Fault LEDs

The Fault LEDs illuminate to indicate:

URGENT: A serious fault requiring immediate attention

SYSTEM: A fault affecting the network to which the Display Module is connected

ZONE: A fault in the VESDA Zone monitored by the Display Module

POWER: A fault in the power supply if the GPI function is used

NETWORK: A communications fault on VESDAnet

AIRFLOW: Higher or lower than acceptable levels of air flow through the inlet pipe(s)

FILTER: The air filter requires changing

FAULTS ► Urgent
  ► System   ► Power   ► Airflow
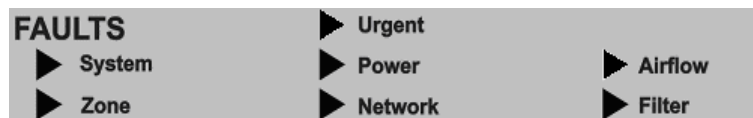 ► Zone   ► Network   ► Filter

Figure 4 - Illuminated lights showing faults

These buttons enable various systems functions. These do not allow configuring the system. The buttons can be disabled by the systems administrator.

Mode/Test (Dual Function): Selects modes on the numerical display - sensitivity, smoke level, or zone number. When depressed for more than two seconds it performs a light test function.

Push Button Keys

Silence: This button silences any alarm or fault warnings. The LEDs stop flashing to acknowledge a fault or alarm condition.

Reset: Resets any latched alarms and faults on the detector. Any active alarms or faults are reported again after the time delays have elapsed.

Isolate: Isolates the detector from any external devices or systems (an isolate alarm will normally be raised at the Fire Alarm Control Panel).

 Note: It is normal practise to signal the Isolate condition to the Fire Control Panel using the Isolate relay.

Sensitivity: Shows the level of smoke that must be measured to illuminate the entire bar graph and always corresponds with the Fire 1 alarm level.

Smoke Level: Indicates the current level of smoke in the relevant VESDA Zone and is represented as % obs/m or % obs/ft.

Numerical Display

Zone Number: This is the VESDA Zone number assigned to the Display Module.

Note: The Mode button is used to select the parameter to display in the numeric display. These values represent the current readings for the corresponding parameters mentioned alongside the lit LED.

Xtralis VESDA LCD Programmer

The Xtralis VESDA LCD Programmer is used for configuring, commissioning and maintenance of the devices on VESDAnet. It can replace either the center or the right plate of the front cover of the detector, or can be mounted at a remote location. A hand-held model is also available. The hand-held model is connected to the VESDAnet socket on the termination card of the detector. For a detailed description and use of the LCD Programmer please refer to the Xtralis VESDA LCD Programmer Product Guide.
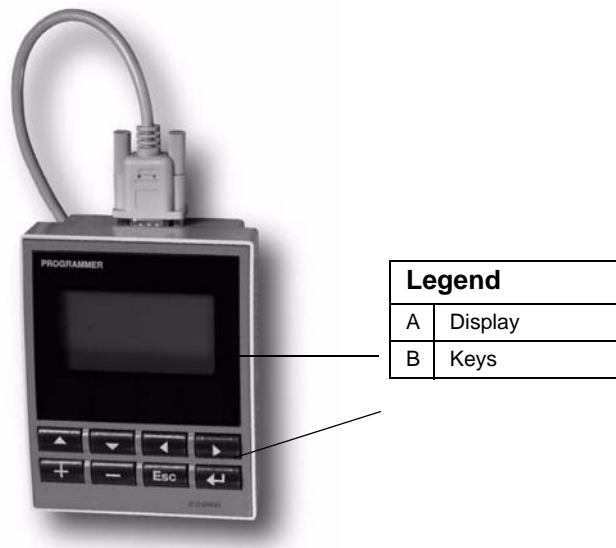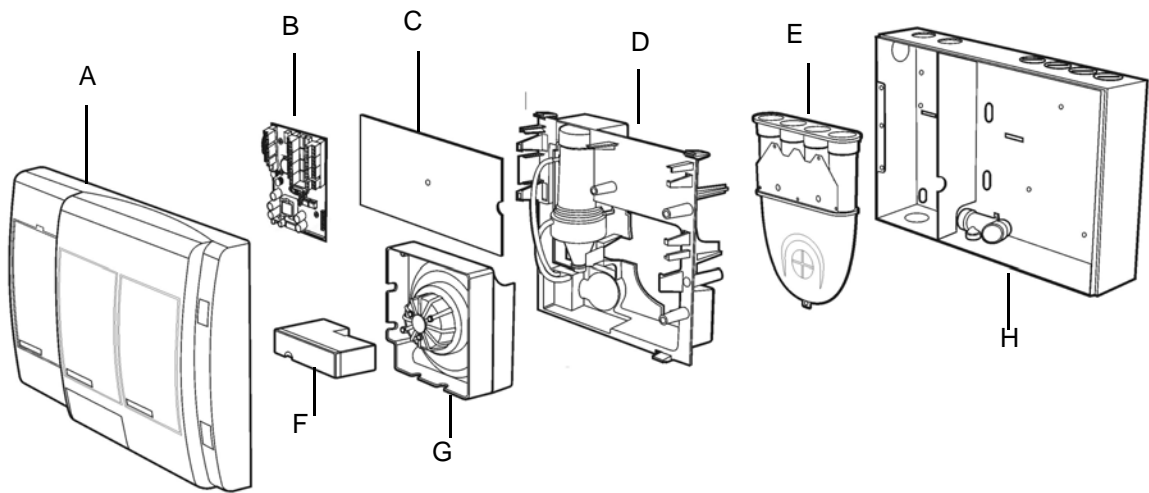

Legend	
A	Display
B	Keys

Figure 5 - LCD Programmer module

VLP Components

Legend			
A	Front cover	E	Pipe inlet manifold
B	Termination card	F	Air filter
C	Blank card protecting processor card	G	Aspirator
D	Chassis with laser detector chamber	H	Mounting box/enclosure

Figure 6 - An exploded view of the detector

4   VLP Product Information

Product Specifications

Supply Voltage	18 to 30 VDC
Power Consumption	@24 VDC
• VLP with Blank Plates 3,000rpm	Normal: 5.8 W Alarm On: 7.0 W
• VLP with Blank Plates @ 4,200rpm	Normal: 9.6 W Alarm On: 10.8 W
• Programmer Module	Normal: 0.6 W (Backlight Off) Alarm On: 2.2 W (Backlight On)
• Display Module	Normal: 1.6 W Alarm On: 2.2 W
Dimensions (WHD)	350 mm x 225 mm x 125 mm (13.8 in x 8.9 in x 4.9 in)
Weight	4.0 kg (9 lbs) including Display and Programmer Modules

Operating Temperature
 	
(To operate the VLP detector outside these parameters please contact your nearest VESDA Technical Office)
	Detector Ambient:
	   UL tested: 0° to 39°C (32° F to 103°F)
	   Sampled Air: -20° to 60°C (-4° to 140°F)
	Humidity: 10-95% RH, non-condensing

Storage Temperatures (Non-operational)	Up to 2 years (battery life) Dry (<95% humidity) 0° to 85°C Must not exposed to sunlight or other radiation sources
Sampling Pipe Network	Maximum length per pipe 100 m (328 ft) Aggregate pipe length: 200 m (650 ft) Pipe Modelling Design Tool: ASPIRE2™
Pipe Size	Internal Diameter: 15-21 mm (0.874 inch) External Diameter: 25 mm (1.05 inch) (25 mm to 1.050 inch adaptor supplied for USA market)
Relays	7 relays. Contacts rated 2A @ 30 VDC. Programmable to latch or non-latch states Programmable 0 - 60 seconds time delay for each relay
Relays Default Configuration	7 relays: Alert, Action, Fire 1, Fire 2, Minor Fault, Urgent Fault and Isolate. (7 x NO/NC contacts)
IP Rating	IP30
Cable Access	8 x 25 mm (1in) knockouts in various positions
Cable Termination	Screw terminal blocks (0.2-2.5 sq mm, 30-12 AWG)
Alarm Range	0.005 to 20.00% obs/m (0.0015 to 6.25% obs/ft.)

Threshold Setting Range	Alert:　　0.005 - 1.990% obs/m
	(0.0015 - 0.6218% obs/ft.)
	Action:　0.010 - 1.995% obs/m
	(0.0031 - 0.6234% obs/ft.)
	Fire 1:　0.015 - 2% obs/m
	(0.0046 - 0.625% obs/ft.)
	Fire 2:　0.020 - 20% obs/m
	(0.0062 - 6.25% obs/ft.)**
	** Limited to 12% obs/m 4% obs/ft. in UL mode All shipments are factory configured for UL Mode. If the UL Mode is switched OFF the UL listing will be voided.
Key Software Features	
• 　Event log:	Up to 18,000 events stored on FIFO basis
• 　AutoLearn:	Minimum 15 minutes
	Maximum 15 days, 23 hrs, 59 minutes
	Recommended minimum period 14 days
	During AutoLearn, thresholds are NOT changed from pre-set values
• 　Referencing:	Compensation for external ambient conditions
• 　Four Alarm Levels:	Alert, Action, Fire 1 and Fire 2
• 　Two Fault Warning Levels:	Minor Fault and Urgent fault
• 　Maintenance Aids:	Filter and flow monitoring
	Event reporting via VESDAnet or event log

Table 1 - VLP Detectors Specifications

Note:　　　　For operating the VLP Detector outside the parameters mentioned above please contact Xtralis VESDA Technical Support

Note:　　　　UL Mode: Factory Default = ON (Fire 2 set to 12% obs/m 4% obs/ft. to comply with UL268)

Note:　　　　Factory Default = OFF (Fire 2 Threshold can be set up to 20% obs/m 6.25%/ft).
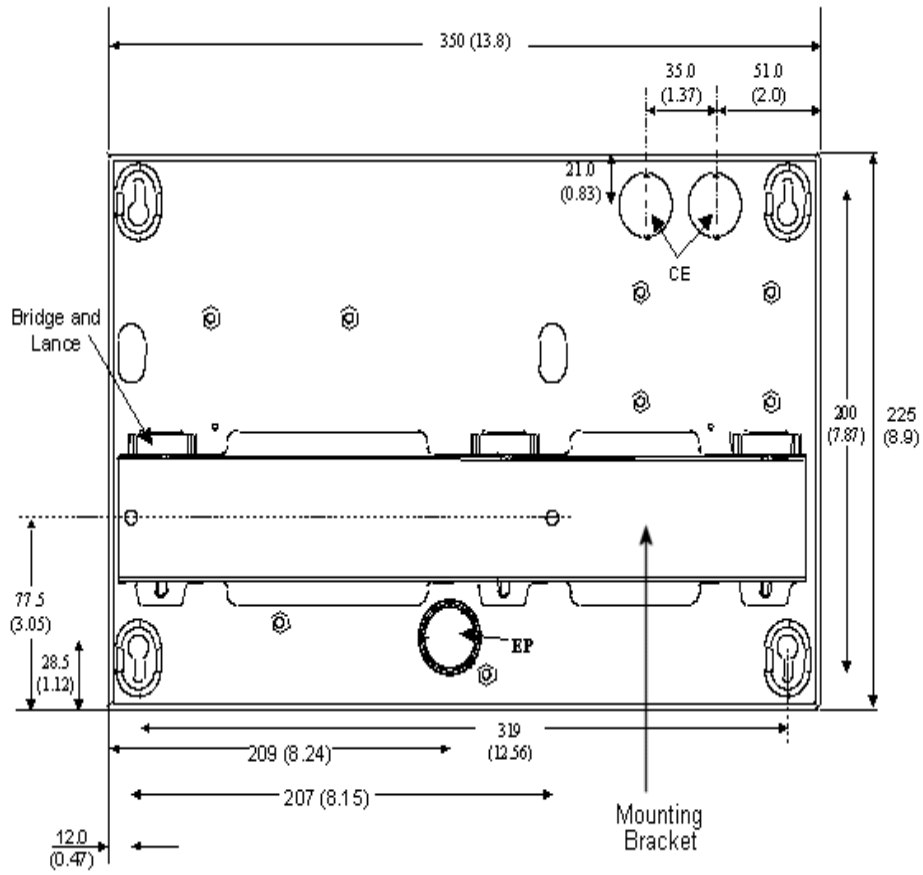
VLP Dimensions
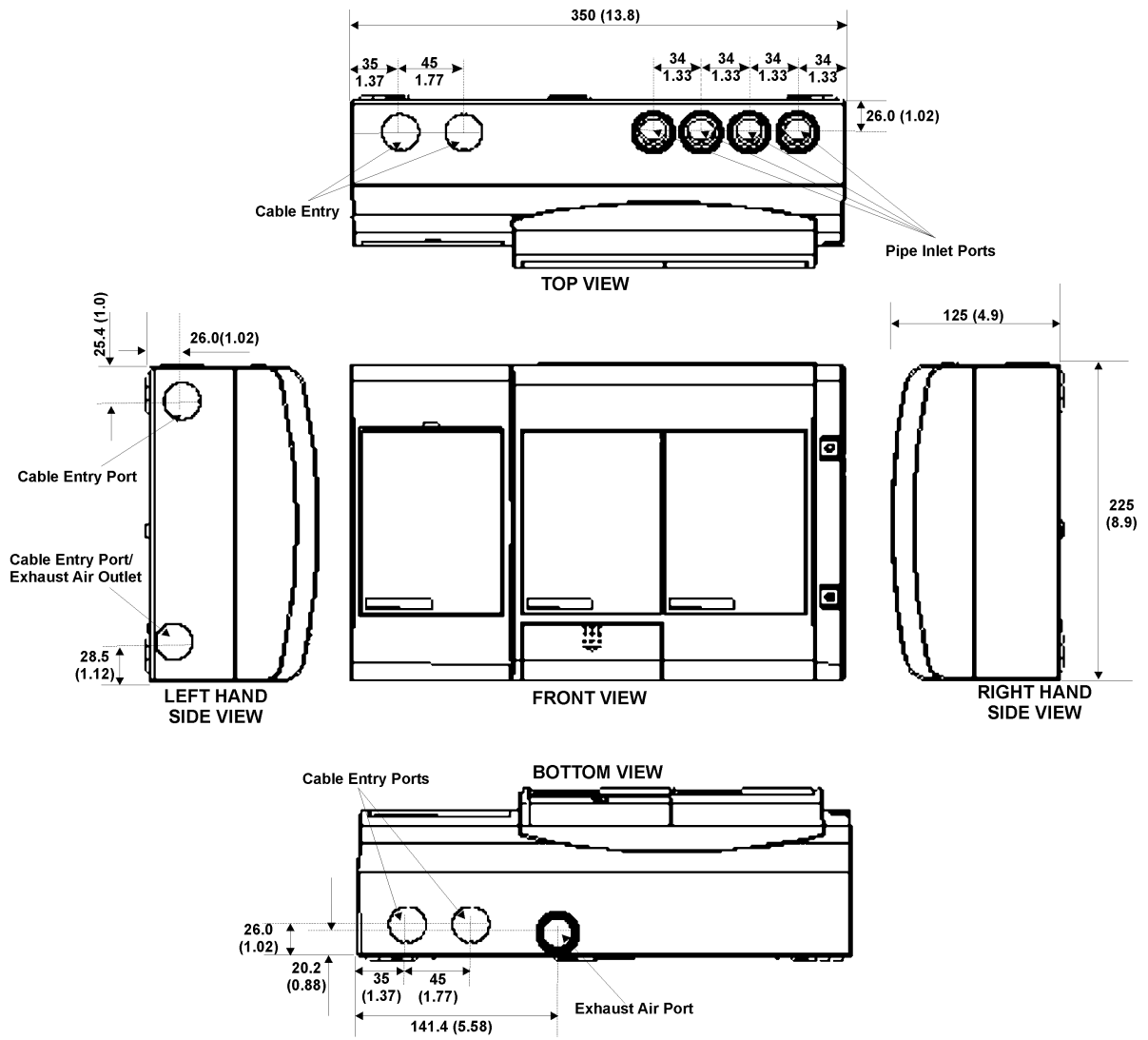

Figure 7 - VLP dimensions - rear view

350 (13.8)

35   45
1.37   1.77

34   34   34   34
1.33   1.33   1.33   1.33

26.0 (1.02)

Cable Entry

Pipe Inlet Ports

TOP VIEW

25.4 (1.0)

26.0(1.02)

Cable Entry Port

**Cable Entry Port/
Exhaust Air Outlet**

28.5
(1.12)

**LEFT HAND
SIDE VIEW**

FRONT VIEW

125 (4.9)

225
(8.9)

**RIGHT HAND
SIDE VIEW**

BOTTOM VIEW

Cable Entry Ports

26.0
(1.02)

20.2
(0.88)

35
(1.37)

45
(1.77)

Exhaust Air Port

141.4 (5.58)

Figure 8 - VLP dimensions

Default Settings

Parameter	Default Value	Range		Access Level
		Minimum	**Maximum**	
Event Log - Events				
• Smoke Level	Enabled	N/A	N/A	Adm
• Alarms	Enabled	N/A	N/A	Adm
• Faults	Enabled	N/A	N/A	Adm
• User Action	Enabled	N/A	N/A	Adm
Fire 2 Threshold	2% obs/m 0.625% obs/ft.	0.02% obs/m 0.0062% obs/ft.	20.% obs/m 6.25% obs/ft.	Adm
Fire 1 Threshold	0.2% obs/m 0.0625% obs/ft.	0.015% obs/m 0.0046% obs/ft.	2% obs/m 0.6250% obs/ft.	Adm
Action Threshold	0.14% obs/m 0.044% obs/ft.	0.010% obs/m 0.0031 obs/ft.	1.995% obs/m (0.6234% obs/ft.	Adm
Alert Threshold	0.08% obs/m 0.025% obs/ft.	0.005% obs/m 0.0015% obs/ft.	1.990% obs/m 0.6218% obs/ft.	Adm
Alarm Delays…Fire 2	10 seconds	0 seconds	60 seconds	Adm
Alarm Delays…Fire 1	10 seconds	0 seconds	60 seconds	Adm
Alarm Delays…Action	10 seconds	0 seconds	60 seconds	Adm
Alarm Delays…Alert	10 seconds	0 seconds	60 seconds	Adm
Delay Times	Simultaneous	Simultaneous	Cumulative	Adm
Instant Fire	Disabled	Enabled	Disabled	Adm
Change-over Times: • Day • Night	 07:00:00 19:00:00	 Two seconds	 11:59:58	Adm
Weekend	Saturday & Sunday	Adjust to suit environment	Adjust to suit environment	Adm
Holidays: • First Day • Last Day	 1-Jan-90 1-Jan-90	 Adjust to suit environment	 Adjust to suit environment	Adm
Smoke Change: • Change By • Min. Interval	 0.02% obs/m 0.0062% obs/ft. 2 seconds	 0.005% obs/m 0.0015% obs/ft. 2 seconds	 0.2% obs/m 0.0625% obs/ft. 10 seconds	Adm Dst
AutoLearn	14 days 0 Hours 0 Minutes	0 Days 0 Hours 15 minutes	15 days 23 Hours 59 Minutes	Adm Adm Adm
Air flow Thresholds: • High Urgent • High Minor • Low Minor • Low Urgent • Delay	 130% 120% 80% 70% 0 seconds	 105% 105% 25% 25% 0 seconds	 200% 200% 95% 95% 60 seconds	 Adm Adm Adm Adm Adm
Flow Control: • Aspirator Speed	 3,000rpm	 3,000rpm	 4,200rpm	Adm
Filter Service Interval	731 days (2 years)	1 Day	3655 days (10 years)	Adm

Parameter	Default Value	Range		Access Level
		Minimum	Maximum	
Reference detector: • Reference Zone No. • Dilution • Delay	255 100% 2 minutes	Selectable 1% 0 minutes	Selectable 100% 15 minutes	Adm Adm Adm
Display - relay Card	None (display only - 7 relay fitted)	Selectable depending on card fitted	Selectable depending on card fitted	Adm
Relay Set	See Table 3, *"Relay assignments and conditions to change state for 7 relays HTC,"* on page 16	See Table 3, *"Relay assignments and conditions to change state for 7 relays HTC,"* on page 16	See Table 3, *"Relay assignments and conditions to change state for 7 relays HTC,"* on page 16	Adm
Communications: Network Delay	 15 seconds	 10 seconds	 45 seconds	 DST
Preferred Port	A	N/A	N/A	DST
Health Check	45 seconds	40 seconds	60 seconds	DST
Open - ended	None	N/A	N/A	DST
UL Version	On	Selectable	Selectable	Adm

Table 2 - Factory default settings and permissible thresholds

Relays

The relays on the head termination card interface to Fire Alarm Control Panels to communicate faults, alarms and isolate states. The relays can be programmed using PC based software or the LCD Programmer and can be assigned multiple assignments. See the LCD Programmer {rpdict Giode for details. relays 3 and 6 are permanently set for Urgent Fault and Fire 1 respectively and can be programmed for additional functions. The table below illustrates default assignments for relays and assignment of multiple functions. It is possible to assign the same function to more than one relay.

VLP relay Assignments and Conditions to Change States

Relays 1, 2, 4, 5 and 7 are fully configured. (For example, relay 5 could be configured to de-energize on Alert)

Note: Assignments to relays 3 and 6 are fixed to Urgent Fault and Fire 1 respectively. These relays may be assigned additional assignments.

Relay #	Default	State change	Latch
1	Isolate	Energizes when an operator isolates the detector by pressing the **Isolate** key on the Display Module or by activating the command via a PC or a LCD Programmer or GPI option.	Unlatched
2	Minor Fault	De-energizes when a Minor Fault is detected.	Latched
3	Urgent Fault	De-energizes when an Urgent Fault is detected.	Latched
4	Alert	Energizes when the Alert alarm is initiated.	Latched
5	Action	Energizes when the Action alarm is initiated.	Latched
6	Fire 1	Energizes when the Fire 1 alarm is initiated.	Latched
7	Fire 2	Energizes when the Fire 2 alarm is initiated.	Latched

Table 3 - Relay assignments and conditions to change state for 7 relays HTC

Relays default settings

Relay	1	2	3	4	5	6	7
Isolate	✔						
Minor Fault		✔					
Urgent Fault			✔				
Alert				✔			
Action					✔		
Fire1						✔	
Fire 2							✔

Note: A ✔ indicates the default setting. Relays 3 and 6 are permanently configured for Urgent Fault and Fire 1 respectively. All other relays can be re configured. More than one function can be configured to any relay.

Table 4 - Default relay assignment

General Purpose Input (GPI) Functions

The input terminal requires a voltage supply between 5V and 30 VDC to operate. The input is isolated from the system by an opto-coupler device. Connect the GPI + terminal to the positive output and the GPI - terminal to the ground output of the external device. The GPI can be configured to initiate a number of different actions - including, by default, a Remote Reset function. The GPI can be configured through the 'Miscellaneous' screen menu of the LCD programmer. See the LCD Programmer Product Guide for details.
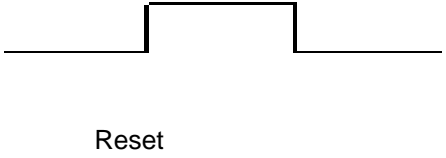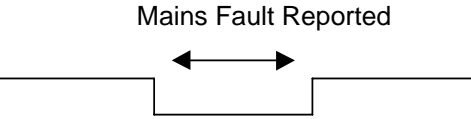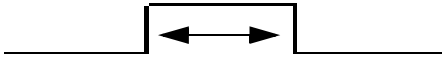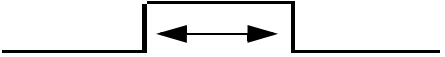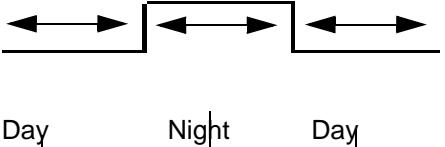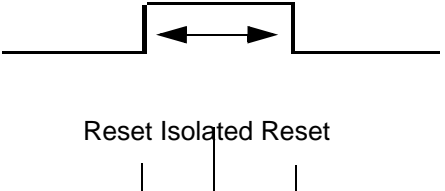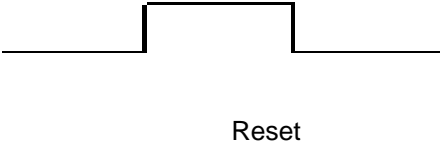
Function	State change	
External Reset	Detector Reset when ≥ 5 VDC is at this terminal.	Reset
Mains OK	The detector monitors the state of the external power supply and responds to the following conditions. Mains OK ≥ 5 VDC at this terminal. Mains Fail ≤ 2 VDC at this terminal	Mains Fault Reported
Standby Mode	The detector Isolates and the aspirator turns OFF when ≥ 5 VDC is at this terminal. **Note:** No Alarms can be generated in this state	
Isolate	The detector isolates when the voltage rises above 5 VDC and De-isolates when the voltage falls below 5V.	
Use Night-time Threshold	The detector switches over from day-time to night-time thresholds when ≥ 5 VDC are at these terminals.	Day Night Day
Reset+ Isolate	While power is applied to the GPI the detector is isolated. In addition, the disconnection or connection of power to the GPI resets the unit. ≥ 5 VDC detector isolates ≤ 2 VDC detector reset	Reset Isolated Reset
Inverted Reset	This is the reverse of the normal reset function. ≤ 2 VDC detector reset ≥ 5 VDC normal operating mode	Reset

Table 5 - GPI functions

Note: The signal voltage into the GPI terminals must be between 5 to 30 VDC.
Note: When the detector is isolated or de-isolated as a GPI function, the status cannot be changed through the normal isolate/de-isolate functions of the Display Module or the LCD Programmer.

Note: When the night-time threshold is configured as a GPI function, it overrides the clock settings for day-start and night-start.

When using the standby or remote isolate options it is recommended that all displays on VESDAnet are configured to have the Isolate button disabled. When programming the display through the LCD Programmer choose Isolate Disabled from the Button Lockout menu.

5   Mounting the VLP

The VLP detector can be mounted onto the wall or on any suitable secure surface using the mounting bracket. It is **strongly recommended** that the detector is mounted on to the mounting bracket included with the packaging. Determine the cable entry ports and the air exhaust port before mounting the detector. Consideration should also be given to the positioning of the pipe inlet ports in relation to the existing pipe network.

Caution: Press out the relevant knockouts taking care **not to damage** the relays and terminals on the termination card.

Securing the mounting bracket

The orientation required for the VLP detector will determine how the mounting bracket is placed. To secure the mounting bracket to the mounting surface place the flat side against the surface ensuring that the lances do not sit flush to the surface. The figure below illustrates the bracket position for normal and inverted orientations. Secure the mounting bracket to the surface using appropriate fasteners, ensuring that the bracket is horizontally straight and sits flush on the surface.
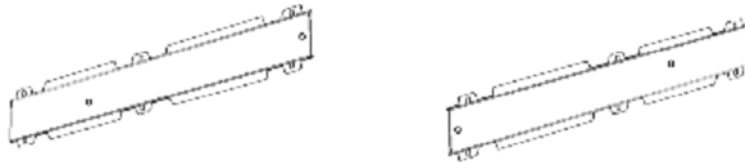
Figure 9 - The mounting bracket in normal and inverted orientation

Mounting the VLP in Normal Orientation

Place the three bridges located at the rear of the detector onto the lances of the mounting bracket. Push downwards until it locks onto the lances and engages the fitting dimples. To prevent unwanted removal of the detector, secure the detector to the mounting surface by placing two screws through the keyhole slots situated near the termination card.
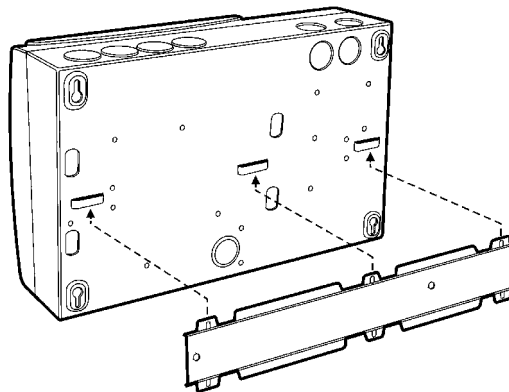
Figure 10 - Mounting the VLP detector onto the mounting bracket

Mounting the VLP in the Inverted Orientation

If the detector is fitted with a LCD Programmer and/or a Display Module, re-orient these to the upright position. Mount the detector in inverted orientation onto the mounting bracket.
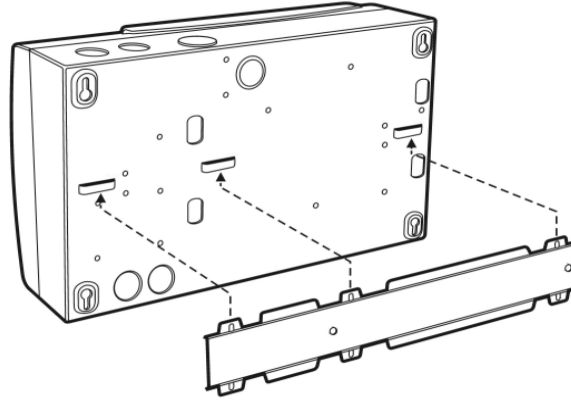
Figure 11 - Mounting the VLP detector in inverted orientation onto the mounting bracket

Mounting the VLP without a mounting bracket

In the event the detector has to be mounted directly onto the mounting surface, remove the chassis from the mounting box. See *Replacing the chassis/Air Inlet Pipe Manifold* on page 32 for details.

Use the four keyhole slots to secure the mounting box to a flat surface, ensuring that it is horizontally straight. Re-install the chassis into the mounting box. Carefully re-connect the looms and complete the cabling prior to closing the front cover. See *Internal Wiring for VLP* on page 34

Note: The laser detector chamber, head processor card and flow sensors are factory calibrated as a matched set. Separating the set and replacing it with components from another set may cause the detector to malfunction, requiring re-calibration at the factory.

Recess mounting kit

These kits are used to house a detector inside a wall cavity.
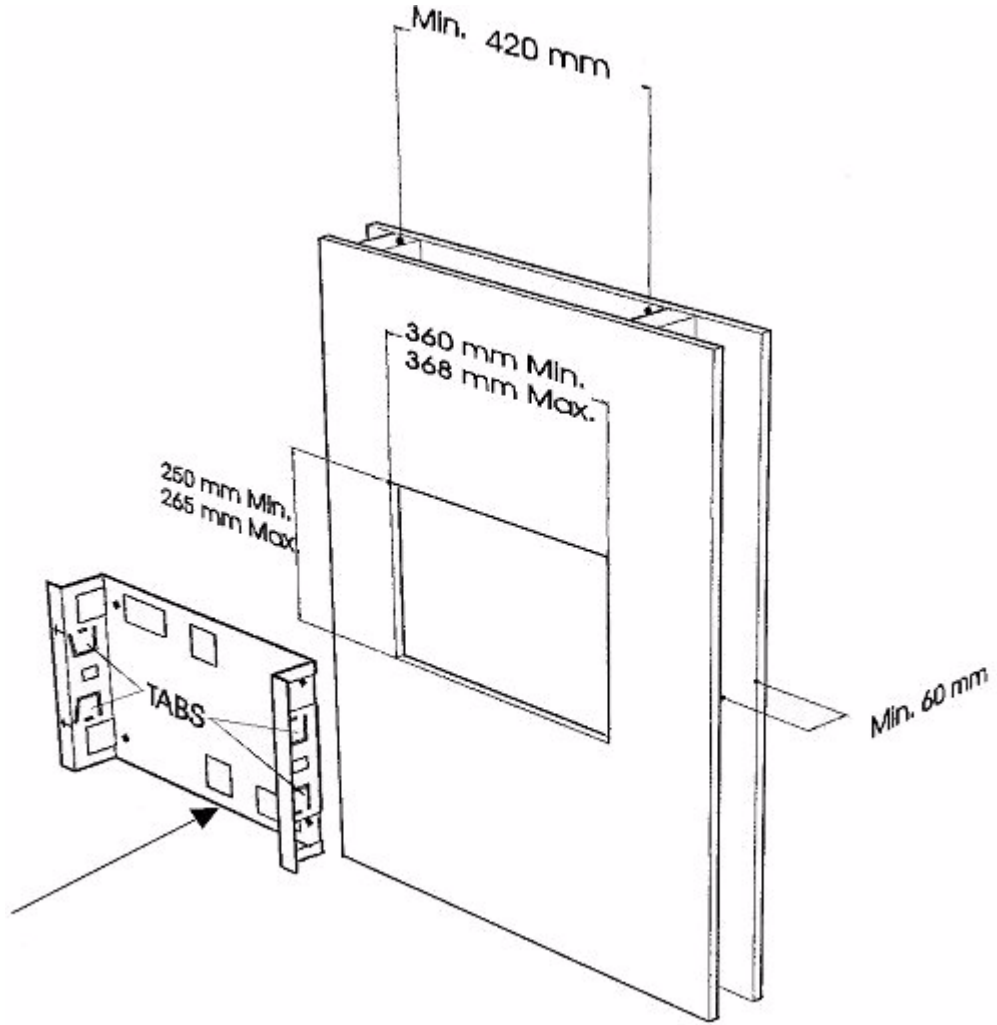
Figure 12 - Recess mounting kit

6   Connecting the VLP to the Pipe Network

Inlet Pipes

The inlets in the pipe inlet manifold are designed to receive a standard pipe of 25 mm (1 in) OD. A 25 mm to 1.050 inches adaptor to fit the pipe inlet manifold is included for all shipments to USA.
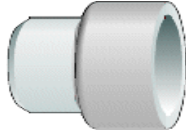
Figure 13 - Pipe Adaptor

The design of the air inlet ports allow insertion of the sampling pipe to a depth of 15 mm. (0.60 in). This prevents the sampling pipes from damaging the flow sensors. While connecting the detector to the pipe network:

- Ensure a minimum length of 500 mm (19.7 in) of straight pipe before terminating the pipes at the air inlet ports of the detector.
- Square off and de-burr the end of the sampling air pipes, ensuring the pipes are free from swarf.
- Determine the Air Inlet Ports to be used. See Table 6 on page 22 for details.
- Remove the plugs from **only** those Air Inlet Ports intended for use.
- Insert the pipes into the pipe inlet(s) ensuring a firm fit.

Note: **DO NOT** glue the inlet pipes to the pipe inlet manifold.

When configuring the detector ensure that the correct pipes in use are selected.:

No. of Pipes	Preferred Pipe Inlet Port to Use			
	Pipe 1	Pipe 2	Pipe 3	Pipe 4
1		✔		
2		✔	✔	
3		✔	✔	✔
4	✔	✔	✔	✔

Table 6 - Preferable use of pipe inlet ports
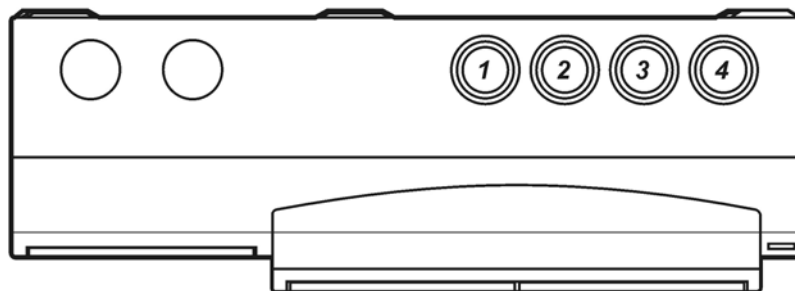
Figure 14 - Pipe inlet port numbering

Managing the Exhaust Air

To exhaust air from the detector, use the exhaust ports at the rear or at the bottom of the head mounting box.   Remove the appropriate exhaust port plugs and if required, connect an outlet pipe to the exhaust manifold. In the event the side port is used as an exhaust port, press out the knockout hole. Remove the plug on the exhaust manifold, located at the divider of the chassis and the termination card. Run a 25 mm (1 inch) pipe through the side port and insert into the exhaust manifold, ensuring it is a tight fit.

Note: **DO NOT** glue this pipe to the exhaust manifold.
Note: Some applications may require the air exhausted from the detector to be returned to the sampling area.

7   VLP Wiring Connections

The Termination Card

The termination card acts as the interface for VESDAnet, power supply, relays and the General Purpose Input (GPI).
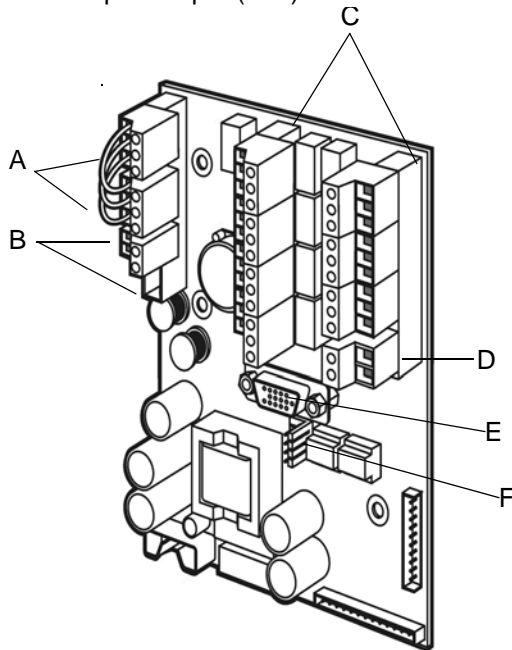
Legend	
A	VESDAnet Terminals
B	Power Terminals
C	Relay Terminals
D	GPI Terminal
E	VESDAnet Socket
F	FOK LED Connectors

Figure 15 - Terminal card illustrating relays and termination points

VESDAnet Terminals

VESDAnet is a bidirectional data communication network between connected Xtralis VESDA devices. VESDAnet cables are terminated at the VESDAnet A and B Terminals on the termination card. Communication wires from another Xtralis VESDA device are brought into the detector at one terminal and looped out to another device on VESDAnet from the other terminal. It is necessary to maintain the polarity throughout the network. It is recommended that RS 485 (Belden 9841 - 120 Ohm) twisted pair cables, or similar cables be used.

The VLP detector is shipped with the VESDAnet A and B terminals looped. If the detector is not to be networked with other devices, then do not disturb this loop. Remove this loop to connect the detector to the VESDAnet.
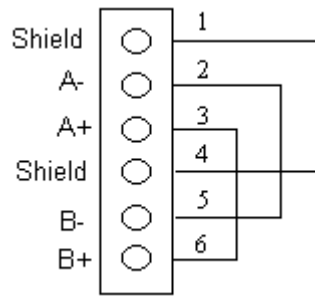
Figure 16 - Stand-alone VESDAnet connection
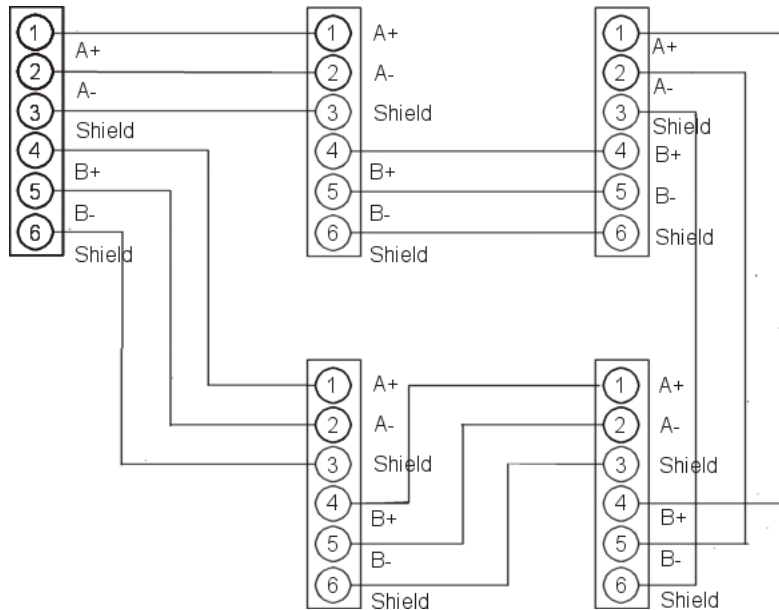
Figure 17 - An example of the wire connection for VESDAnet (closed loop for illustrative purposes only)

Connections for GPI
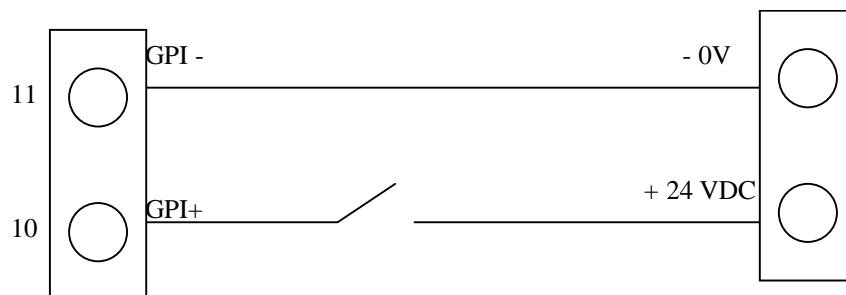
Figure 18 - Wire connection details (GPI)

Typical Wiring To Fire Alarm Control Panel (FACP)

The diagram below shows the correct way to wire Xtralis VESDA laser detectors to a conventional fire alarm control panel (FACP). It also shows where an End Of Line (EOL) resistor is correctly installed.
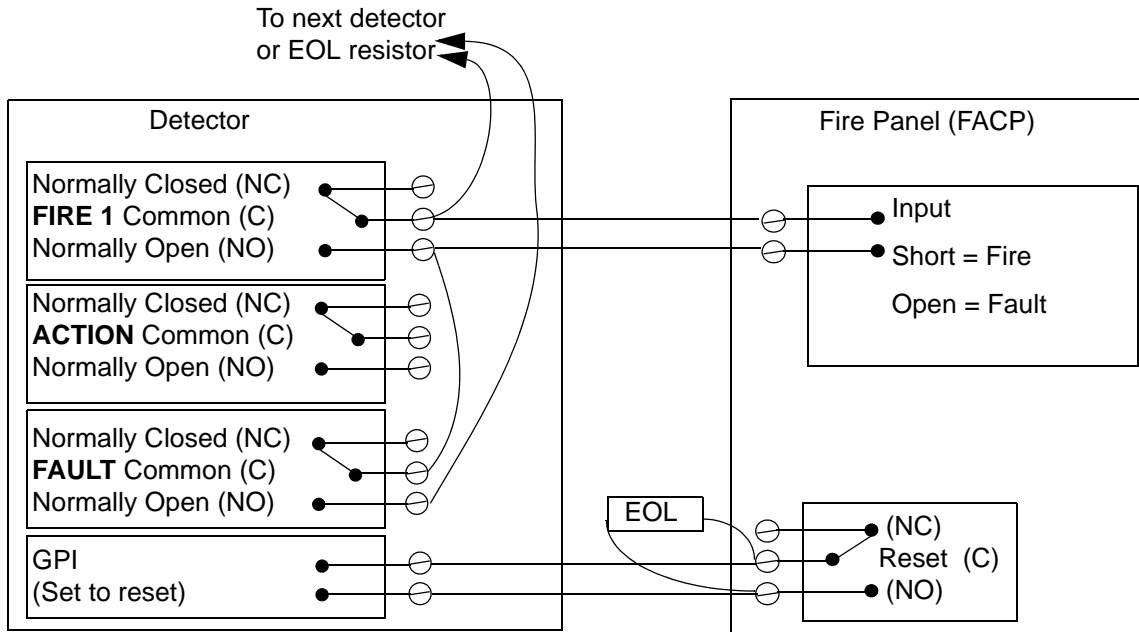
Figure 19 - Typical wiring to a fire panel with EOL

Wiring To an Address Loop Module.

This wiring example is for wiring Xtralis VESDA detectors to a typical Address Loop module 3 input 1 output. These are example drawings. Refer to the appropriate product manual for the exact wiring details of the third party equipment.
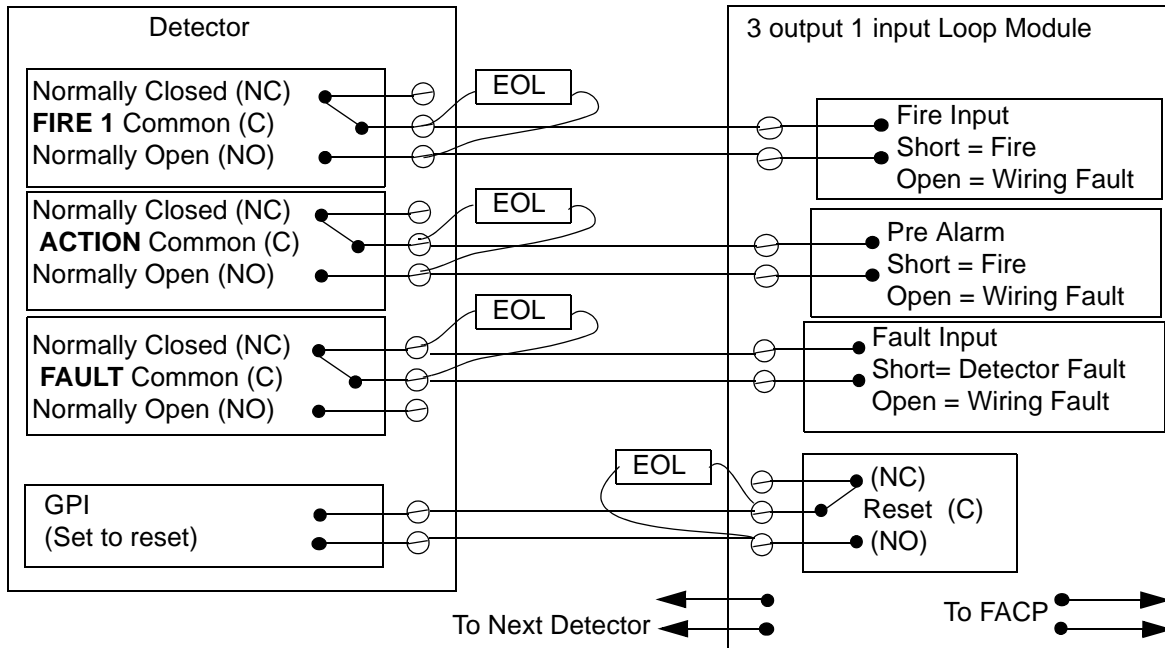
Figure 20 - Addressable Loop Module with EOL

8   Power Source

There are two sets of power terminals on the termination card. Use one set to connect to a 24 VDC power supply and if required loop out to another device via the second set. The detector has reverse polarity protection to minimize the risk of reverse power connection to the detector. For further information see *Product Specifications* on page 10.

Caution: The VLP detector will not operate when the supply is reversed.

Note: Operating the detector when DC supply voltage is outside the voltage range of 18 VDC and 30 VDC may cause damage to the device.
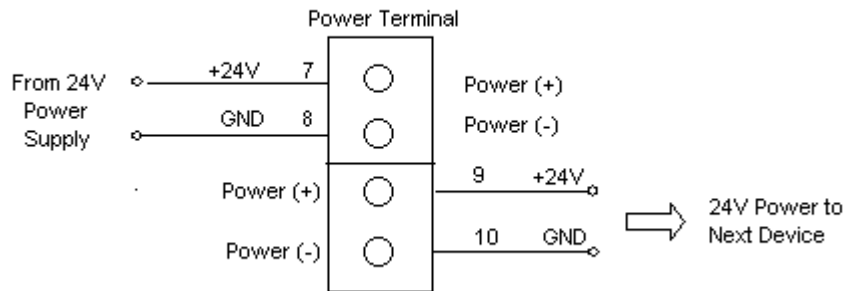
Figure 21 - Wire connection details for power terminals on relays termination card

9 Back Up Battery

The power supply for the VLP detector is switched to a back up battery in the event of a mains power supply disruption. The size of the back up battery is determined by local standards and codes, the total power required by the system, back up time required, allowance for reduction in capacity with age and expected temperature variations.

Note: It is recommended that batteries be inspected and changed as per manufacturer's specifications or as per your local codes and standards.

To facilitate the calculation of the backup battery size a Battery Calculation Sheet is included below.

Equipment	Normal loads @ 24 V DC			Full alarm load @ 24 V DC		
	Load mA	Qty.	Total	Load mA	Qty.	Total
Detector @ 3000rpm	240			290		
Detector @ 3500rpm	280			330		
Detector @ 4000rpm	320			370		
Detector @ 4200rpm	340			390		
Integral Display	60			80		
Integral Programmer	20 (backlight off)			80 (backlight on)		
Remote Display	90			110		
Remote Programmer	50 (backlight off)			110 (backlight on)		
Hand-held Programmer	50 (backlight off)			110 (backlight on)		
Systems relay Module	60			105		
Remote termination card - 7 relays	60			105		
Other 24V loads						
		Total mA			Total mA	
			X			X
	Standby Hours			Alarm Hours		
			=			
	Standby Capacity			Alarm Capacity		
				Total Capacity = Standby + Alarm		
				Divided by 1000 for Standby Capacity		
				Multiply by battery factor X1.25		

Table 7 - Calculating the size of backup battery

Note: If intelligent VESDA power supply is fitted it will report power failures (F15) on VESDA*net*. VLP & VLS with GPI terminals connected will maintain their aspirator speed for an hour after the loss of mains power. After which, the aspirator speed will be limited to 3000 rpm to conserve power.

10 Powering Up

A VLP detector must be powered up by Xtralis VESDA accredited personnel only.

After installing the VLP detector it is necessary to power up the system.

The system takes approximately 15 seconds to power up.

If the system fails to power up, check all power wires are secured to its terminals and the polarities of the power wires are correctly terminated.

On power up:

- The aspirator starts up and air is felt flowing out of the exhaust port
- If a programmer module is fitted, the word "VESDA" will be displayed
- If a Display Module is fitted, the following indicators are lit:
    - Fire Alarm Threshold indicators
    - Smoke Threshold indicators on bargraph
    - Two digit numerical display
    - Various fault indicators if there are any faults
    - System OK indicator if there are no faults

If any of the above does not happen, contact your commissioning engineer or distributor to troubleshoot.

Note: It is normal for the detector to display troubles immediately after power up. Reset the detector by pressing the reset button on the front cover of the detector to unlatch the relays and fault LEDs. The LEDs for any remaining faults cover will illuminate. Proceed with the preliminary systems check.

Installation Checklist

Site Name	
Address	
Detector Serial Number(s) and Date of Manufacture	
Interface Card Serial Number & Date of Manufacture	
Name of Installer	
Signature	
Date	

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. Were the detector and the mounting bracket intact in the box?		
2. Is the detector securely locked onto its mounting bracket? Note that the two mounting bracket securing-screws are provided in a separate bag with the detector.		
3. Is the sampling air pipe firmly connected to the air inlet port? Ensure the pipe is <u>NOT</u> glued.		
4. Have the power wires been connected to the correct terminals on the detector?		
5. If required, has the end of line resistor been connected?		
6. Have the alarm signalling wires been terminated to the correct terminals of the detector?		
7. Has the Interface card been correctly installed according to the instructions provided (if applicable)?		
8. Has the plug at the exhaust port been removed and the exhaust pipe (if fitted) not glued?		
9. Has the front cover been replaced correctly?		
10.Has AutoLearn Flow and AutoLearn Smoke been performed? Please state the AutoLearn Smoke period_____		
11.Is the air sampling pipework installed and checked as per the site plans?		

Table 8 - Installation Checklist

11 Preliminary Systems Check

A preliminary systems check is required after installing the VLP detector, before it is commissioned for use. The check can be conducted by connecting the detector to a LCD Programmer or using VSC or VSM4 PC based software. The preliminary systems check includes:

- Conducting a VESDAnet communications check
- Selecting pipes in use
- Accepting factory default configurations, or changing to site requirements
- Normalizing the air flow
- Conducting a basic pass/fail smoke test
- For details on preliminary systems check refer to the LCD Programmer or the relevant software manuals

Refer to the VESDA LCD Programmer and Commissioning Guides for further details.

12 Maintaining the VLP detector

To maintain the VLP at its peak performance the maintenance schedule given below should be followed. Maintenance can be conducted by the original installer, a VESDA distributor, or a service contractor. To work effectively the VLP detector needs to be supported by a well designed pipe network. The VESDA Maintenance Manual contains a schedule for pipe network maintenance.

Maintenance Check	Quarterly	Six Monthly	Annual	Every Two Years
Power Supply	✔			
Check Pipe Network		✔		
Filter Inspection			✔	
Pipe Integrity Smoke Test			✔	
Check Pipe Flow			✔	
Clean Sampling Point.				✔
Flush Pipe Network				✔

Table 9 - Maintenance schedule for VLP detector

Note: The frequency of maintenance checks could vary depending upon local codes and standards and the environment of the installation.

Caution: While a VESDA Zone is isolated, no fire warnings will be issued by the VLP detector and any fire will go undetected. Prior to any maintenance or testing:

-     Inform appropriate supervising authority about the risk associated with isolating a VESDA Zone.
-     Check to see if the VLP detector is also being used by third party
-     Ensure that any ancillary devices dependent on the VLP detector are enabled by the isolation before work is begun.

Replacing the chassis/Air Inlet Pipe Manifold

1. Isolate unit by pressing the Isolate button on the zone configured display or by selecting **Isolate Zone** from the **Zone** menu in VSC or VSM4. This isolates the outputs from the unit to a Fire Alarm Control Panel.
2. Save node configuration by using VSC or VSM4, highlight the detector in the Device Tree Window and select **Save Node Configuration** from the **Device** menu.
3. Remove power by disconnecting the power cables.
4. Remove the front panel by first opening the cover plate and screw covers, then unscrew the front cover.
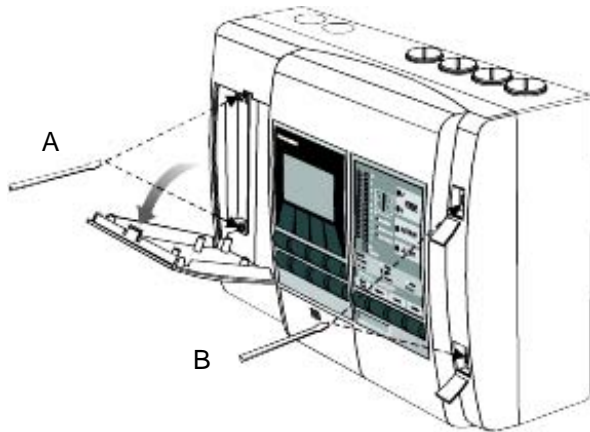
Legend	
A	Cover plate screws
B	Screw covers

Figure 22 - Removing front cover

5. Disconnect data cables connecting the chassis assembly to the termination card, front panel modules (if fitted) and manifold.
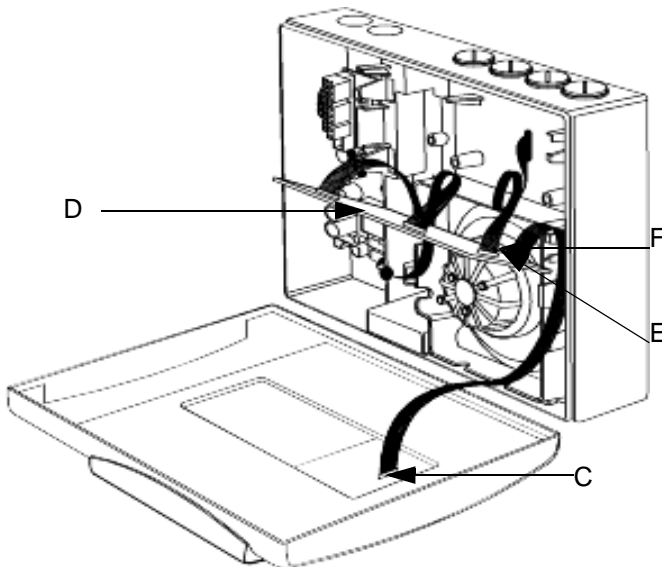
Legend	
C	Termination cable
D	Head processor card
E	Flow sensor cable
F	Scanner cable

Figure 23 - Remove data cables

6. Unscrew the three manifold retaining screws
7. Remove chassis, holding the chassis by the aspirator assembly. Release the two lower locking tabs by lifting the chassis upward and pulling outward. Use a screwdriver to assist with tab release.
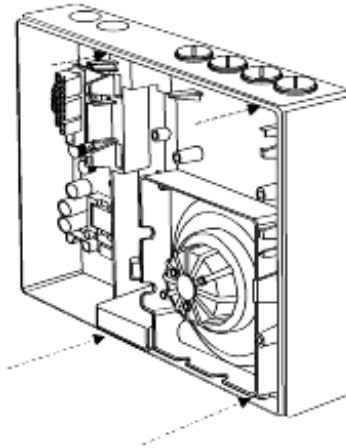
Figure 24 - Remove the chassis

Caution: Care must be taken not to damage the cable running to the manifold.

Note: The chassis consists of the Detection Chamber, head processor card and flow sensors. These are factory calibrated as a matched set and must not be separated. Separating the set and replacing it with components from another VLP will cause the detector to malfunction. This will require the chassis to be returned to the factory.

8.   Disconnect the flow sensor lead.
9.   Unscrew manifold retaining screws.
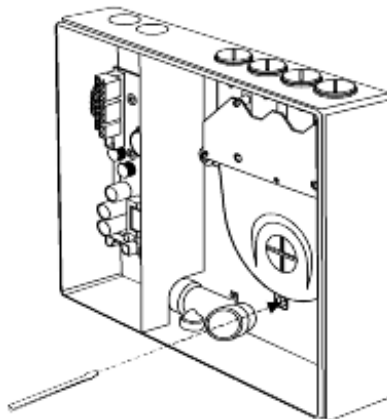
Figure 25 - Removing pipe inlet manifold

10.   Remove the manifold by sliding it downward, away from the pipe network.
11.   Attach the replacement manifold and chassis by reversing the procedure above.
12.   Configure the node using VSC or VSM4 by highlighting the detector in the Device Tree window and highlighting 'Restore Node Configuration' from the device menu, or reprogram the detector using the LCD Programmer.

Note: Data cables must be plugged and unplugged only after power has been removed. Ensure all connectors are seated correctly before applying power to unit. Failure to observe this requirement may cause data corruption that requires factory re-calibration.

Internal Wiring for VLP

The table below provides the cable loom interconnecting details inside the detector. Use the look up table in conjunction with the attached circuit diagram to assist with maintenance.

From	To	Connector Name on CPU	Cable Name	# Pins
CPU card	Filter Switch Card	Filter switch or X12	Fil SW	5
CPU card	Termination or X1 connector on termination card	Termination or X1	Termination	13
CPU card	Relays or X2 connector on termination card	Relays or X3	Relays	10
CPU card	Detection chamber **Do not disconnect**	Pre-amp or X9	Pre Amp	6 Wire ribbon
CPU card	Detection chamber	Laser or X10	Laser	6
CPU card	Aspirator	Aspirator or X11		5
CPU card	Term or X1 connector on programmer or display	Expansion or X2		11

Table 10 - Interconnecting loom details

Note: All connectors are polarized and can only be inserted one way into the socket.
Note: Do not attempt to force the connector into its socket. If there is any difficulty, reverse the orientation of the connector before inserting again.
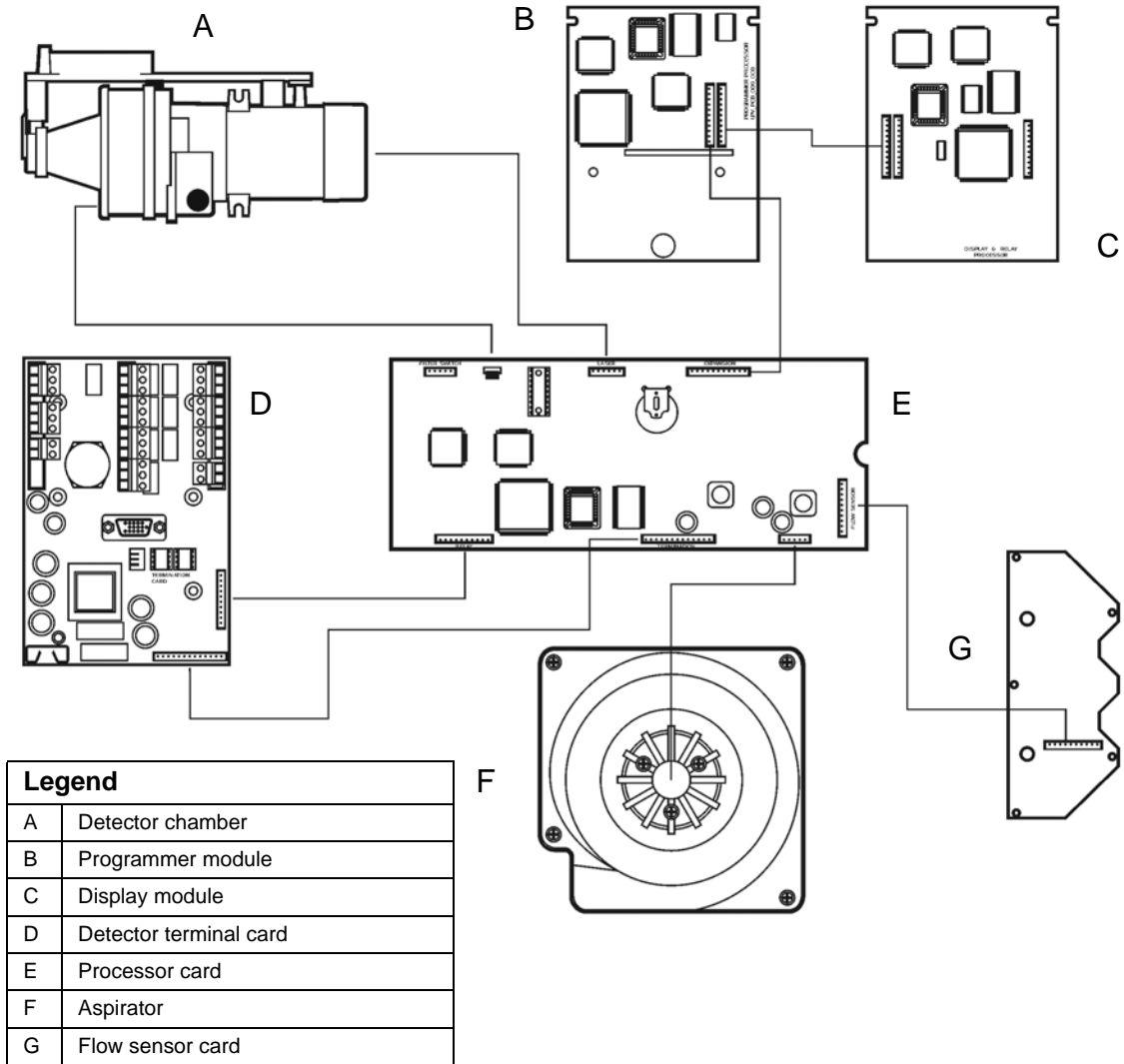
Figure 26 - Internal wiring diagram

Legend	
A	Detector chamber
B	Programmer module
C	Display module
D	Detector terminal card
E	Processor card
F	Aspirator
G	Flow sensor card

Spare Parts

On larger sites having multiple detectors it is advisable to stock certain critical spare parts. A suggested list of spare parts with quantities is given below:

Part No.	Description	Number of detectors Installed to warrant ONE spare part	
		Normal Service	**Mission Critical**
VSP-000	Blank Plate, non-EMC painted, with VESDA logo	N/A	N/A
VSP-001	LCD Programmer	50	20
VSP-002	Display Module	50	20
VSP-005	Filter Cartridge	20	10
VSP-006	VLP detector chassis assembly complete with manifold	50	20
VSP-011	Recess Mounting Kit for VLP	N/A	N/A
VSP-013	Detector Cover Assembly complete with EMC shields	N/A	N/A
VSP-014	7-relay termination card	50	20
VSP-015	VLP detector Aspirator Assembly	N/A	20
VSP-019	Filter Cover	N/A	N/A
VSP-100	Blank Plate with FOK LEDs and Logo	If Applicable	If Applicable
VSP-200	Blank Plate, EMC Painted, without Logo	If Applicable	If Applicable

Table 11 - Suggested spare parts stock

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