VESDA®

Maintenance Guide

July 12, 2007

Document Number: 10256_07

Part Number: 30010

xtralis®

Intellectual Property and Copyright

This document includes registered and unregistered trademarks. All trademarks displayed are the trademarks of their respective owners. Your use of this document does not constitute or create a licence or any other right to use the name and/or trademark and/or label.

This document is subject to copyright owned by Xtralis AG (“Xtralis”). You agree not to copy, communicate to the public, adapt, distribute, transfer, sell, modify or publish any contents of this document without the express prior written consent of Xtralis.

Disclaimer

The contents of this document is provided on an “as is” basis. No representation or warranty (either express or implied) is made as to the completeness, accuracy or reliability of the contents of this document. The manufacturer reserves the right to change designs or specifications without obligation and without further notice. Except as otherwise provided, all warranties, express or implied, including without limitation any implied warranties of merchantability and fitness for a particular purpose are expressly excluded.

General Warning

This product must only be installed, configured and used strictly in accordance with the General Terms and Conditions, User Manual and product documents available from Xtralis. All proper health and safety precautions must be taken during the installation, commissioning and maintenance of the product. The system should not be connected to a power source until all the components have been installed. Proper safety precautions must be taken during tests and maintenance of the products when these are still connected to the power source. Failure to do so or tampering with the electronics inside the products can result in an electric shock causing injury or death and may cause equipment damage. Xtralis is not responsible and cannot be held accountable for any liability that may arise due to improper use of the equipment and/or failure to take proper precautions. Only persons trained through an Xtralis accredited training course can install, test and maintain the system.

Liability

You agree to install, configure and use the products strictly in accordance with the User Manual and product documents available from Xtralis.

Xtralis is not liable to you or any other person for incidental, indirect, or consequential loss, expense or damages of any kind including without limitation, loss of business, loss of profits or loss of data arising out of your use of the products. Without limiting this general disclaimer the following specific warnings and disclaimers also apply:

Fitness for Purpose

You agree that you have been provided with a reasonable opportunity to appraise the products and have made your own independent assessment of the fitness or suitability of the products for your purpose. You acknowledge that you have not relied on any oral or written information, representation or advice given by or on behalf of Xtralis or its representatives.

Total Liability

To the fullest extent permitted by law that any limitation or exclusion cannot apply, the total liability of Xtralis in relation to the products is limited to:

(i) in the case of services, the cost of having the services supplied again; or

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

Indemnification

You agree to fully indemnify and hold Xtralis harmless for any claim, cost, demand or damage (including legal costs on a full indemnity basis) incurred or which may be incurred arising from your use of the products.

Miscellaneous

If any provision outlined above is found to be invalid or unenforceable by a court of law, such invalidity or unenforceability will not affect the remainder which will continue in full force and effect. All rights not expressly granted are reserved.

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.

Contact Us

The Americas	+1 781 740 2223
Asia	+852 2297 2438
Australia and New Zealand	+61 3 9936 7000
Continental Europe	+41 55 285 99 99
UK and the Middle East	+44 1442 242 330
www.xtralis.com	

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

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.

Document Number: 10256_07

Part Number: 30010

1. Introduction 1
1.1 Scope 1
1.2 Maintenance guide brief outline 1
1.3 Maintenance overview - Who & When? 1
1.4 Important pre-maintenance preparations 2
1.5 Maintenance schedule summary 2

2. Detector maintenance 2
2.1 Maintenance considerations 2
2.2 Equipment required 3
2.3 Determining a maintenance schedule 3
2.4 Maintenance procedures 4
2.5 Unscheduled maintenance 5
2.6 Checking airflow 6
2.7 Checking the filter 6

3. Power supply maintenance 7

4. Sample Pipe Network maintenance 7
4.1 Important pre-maintenance preparations 7
4.2 Cleaning sample pipes 7
4.3 Cleaning sample holes 8
4.4 Cleaning capillary tubes 9

5. Post-maintenance testing 9

6. Annual testing 10
6.1 Detector tests 10
6.2 System fire panel notification tests 11

7. Replacing detector components 11
7.1 Replacing LaserPLUS and LaserSCANNER filter cartridges 11
7.2 Replacing the LaserCOMPACT filter cartridge 12
7.3 Replacing the LaserFOCUS filter cartridge 13
7.4 Replacing LaserPLUS and LaserSCANNER chassis 14
7.5 Replacing LaserPLUS and LaserSCANNER aspirators 17
7.6 Replacing the LaserCOMPACT aspirator 19
7.7 Replacing the LaserFOCUS aspirator 20
7.8 Replacing LaserPLUS and LaserSCANNER termination cards 21
7.9 Replacing the LaserCOMPACT termination card 22
7.10 Replacing LaserPLUS and LaserSCANNER detector modules 23
7.11 Inspecting and cleaning LaserSCANNER valves 23

Appendix A: Laser Products Parts List 25

Appendix B: Recommended frequencies for general maintenance and filter cartridge replacement 27

Appendix C: Example Of A Typical Maintenance Log 29

1 Introduction

1.1 Scope

This Maintenance Guide provides essential information for service personnel maintaining VESDA laser detector systems. It includes suggestions for a maintenance schedule and instructions on servicing the different VESDA detector components.

Knowledge about local fire regulations, electrical codes and standards is assumed. Anyone responsible for maintenance should possess this knowledge.

Important Note: Xtralis strongly recommends that all persons who install, commission, service and/or maintain VESDA systems attend the VESDA accreditation training. Please contact your local Xtralis office for more information.

1.2 Maintenance guide brief outline

The information presented in this Maintenance Guide is arranged into the following sections:

- Section 2 - describes how to determine an appropriate maintenance schedule and maintenance procedures for VESDA detectors.
- Section 3 - describes how to maintain the power supply.
- Section 4 - describes how to maintain the sample pipe network.
- Section 5 - provides information on post-maintenance testing.
- Section 6 - provides information on annual testing.
- Section 7 - describes the procedures for replacing parts on the range of VESDA detectors
- Appendix A: provides a list of part numbers.
- Appendix B: provides application specific information on determining an appropriate maintenance schedule.
- Appendix C: provides a sample maintenance log, which should be completed as part of each maintenance visit.

1.3 Maintenance overview - Who & When?

To maintain the VESDA laser detector system at its peak performance level, the suggested maintenance schedule should be followed. Maintenance can be conducted by the original installer, a VESDA distributor or a service contractor. The optimum operation of a VESDA laser detector system requires that the equipment is supported by a well designed and maintained sample pipe network. The site conditions and the local codes & standards may require more regular maintenance than that recommended by Xtralis.

Maintenance frequency must be increased in industrial applications such as coal-fired power stations, factories, distribution facilities and warehousing with high vehicular traffic loads since these applications commonly have high levels of background pollution.

Note: Xtralis have adopted the fire industry term 'Disable' for the VLF and all future products. The VLP, VLS and VLC continue to use the term 'Isolate'. Both terms are used throughout this document and have the same meaning.

Note: Xtralis have adopted the fire industry term 'Address' instead of the formerly used term ‘Zone’ for the VLF and all future products. The VLP, VLS and VLC continue to use the term 'Zone'. Both terms are used throughout this document and have the same meaning.

1.4 Important pre-maintenance preparations

All maintenance procedures require the VESDA system to be isolated during maintenance and testing. Failure to isolate the system, may lead to unwanted alarms and initiation of fire response systems. When a VESDA system has to be isolated, alarms will be displayed but no relays will be tripped. Prior to isolating a VESDA system for maintenance, you must do the following:

1. Inform the appropriate supervising authority about the risk associated with isolating a VESDA Address.
2. Ensure that any ancillary devices, dependent on the detector, are appropriately isolated. When a VESDA detector is isolated, a fault is signalled at the monitoring system. This is acknowledged either by wiring the isolate relay in series with the fault relay (VLP and VLS) or by configuring the fault relay (fault number 3) to trigger an isolate.

1.5 Maintenance schedule summary

Table 1 contains a summary of the suggested maintenance schedule.

Table 1: VESDA maintenance schedule summary.

Maintenance Task	Every Visit	Monthly	Six Monthly	Annual	Every Two Years
Check Detector & Filter	See Recommended VESDA Maintenance Period & Filter Cartridge Replacement Frequency Appendix B:.				
Check Power Supply			✓		
Inspect Pipe Network			✓		
Check Air flow (per pipe)	✓				
Perform System Integrity Smoke Test				✓	
Clean Sampling Points					✓
Flush Pipe Network					✓

Note: The above table only applies to clean environments.
If local codes and standards for the site require more frequent maintenance, their guidelines must override those suggested in this Maintenance Guide.
Maintenance schedules may also vary according to operating conditions.
Sample pipe flushing and the cleaning of sample holes should be conducted as frequently as required by the detector type and environment.

2 Detector maintenance

2.1 Maintenance considerations

Before beginning system maintenance, the important considerations are as follows:

- What will the maintenance schedule be?
- What maintenance procedures will be required?
- What unscheduled maintenance needs may arise?

2.2 Equipment required

In order to properly maintain the VESDA system, you will require the following equipment:

- Phillips head screwdriver "1" (length 90 mm minimum) - for filter replacement.
- Phillips head screwdriver "2" - for removing all detector covers.
- PC with VSC and a High Level Interface (HLI), HLI model number VHX-0200 or VHX-0210. Xtralis recommends the use of VSC and a HLI. However, a hand-held programmer could also be used for this purpose.
- Vacuum cleaner.
- Air compressor.
- Spare parts (refer to *Appendix A: Laser Products Parts List* on page 25).
- Records for commissioning and a maintenance history.
- Maintenance logs or record sheets.
- The original ASPIRE2 design file and commissioning history (optional).

2.3 Determining a maintenance schedule

The background smoke readings, recorded in the VESDA detector event log, provide a representative value for the protected environment. Use of these logs allows the recommended filter replacement frequency to be calculated, a maintenance program developed and a maintenance schedule determined.

VSC can be used to access the event log to determine the average background smoke level. Average smoke levels over a 15-minute period (minimum), where conditions should reflect the typical operating area, provide enough data to determine the environment type. For clean environments, the significant smoke change will need to be set to 0.005%obs/m (0.0015%obs/ ft) for the test period. Remember to return this setting to its original value, once the test is completed.

Important Note: The following steps do not represent a complete list of instructions. You must also refer to the sections, of this manual, specific to the various types of VESDA detector.

To determine an appropriate maintenance schedule, follow the instructions listed below:

1. Ensure that detectors are isolated from the monitoring panel and suppression systems.
2. Notify the relevant authorities about the work to be performed and the risks associated with isolating a VESDA address.
3. If a filter fault is displayed, the current filter is older than the recommended filter replacement frequency. Replace the filter, according to the detector's guidelines, making sure that you write the date of replacement on the label and take measures to order stock (VSP-005) for the next replacement date. For detector specific filter replacement instructions, refer to *Replacing LaserPLUS and LaserSCANNER filter cartridges* on page 11, *Replacing the LaserCOMPACT filter cartridge* on page 12 and *Replacing the LaserFOCUS filter cartridge* on page 13. The color codes for the dates of filter manufacture are given in Table 2.

Table 2: Color codes for filter date of manufacture.

Color	Date
Yellow	July 2006
Green	July 2004
Orange	July 2000
Blue	July 1997

4. Check for and record any detector faults.
5. Prior to downloading the smoke event log, use VSC to check the significant smoke change setting. If it is still at the factory default value of 0.02%obs/m (0.0063%obs/ft) or some other value, record it then change it to 0.005%obs/m (0.0015%obs/ft).
6. Run the detector for 15 minutes minimum (longer is recommended in very stable or clean environments).
7. Download and save the event log for comparison of smoke readings during normal operation.
8. Determine the detector's background smoke level and estimate the average recorded level, for typical operation, during the test period.
9. Compare the results with *Appendix B: Recommended frequencies for general maintenance and filter cartridge replacement* on page 27 to determine your VESDA system's environment class.
10. Based on your system's environment class, establish an appropriate detector and filter maintenance schedule.
11. Using VSC, set the filter service timer to the value, in days, given in *Appendix B: Recommended frequencies for general maintenance and filter cartridge replacement* on page 27.
12. Using VSC, return the significant smoke change setting to its original value.
13. Proceed to the next section or, if your system is showing no faults, return it to its normal operating mode.

2.4 Maintenance procedures

This section provides instructions for the regular maintenance of detectors. If you need to address faults, refer to the Troubleshooting Guide for a list of VESDAnet faults. Should you need to address the 10 instant fault finder faults, on the VESDA LaserFOCUS (VLF) detector, refer to its Product Guide.

Further information on maintenance, part replacement and recommended filter cartridge replacement frequency are provided throughout the remainder of this document.

Important Note: Xtralis recommends that you record all work you perform in a maintenance log such as that in *Appendix C: Example Of A Typical Maintenance Log* on page 29.

If you do not need to determine a maintenance schedule, continue with the instructions listed below:

1. Ensure that the detectors are isolated from the monitoring panel and suppression systems.
2. Notify the relevant authorities about the work to be performed and the risks associated with isolating a VESDA address.
3. Check for and record any detector faults.
4. If a filter fault is displayed, the current filter is older than the recommended filter replacement frequency. Replace the filter, according to the detector's guidelines, making sure that you write the date of replacement on the label and take measures to order stock (VSP-005) for the next replacement date. For detector specific filter replacement instructions, refer to *Replacing LaserPLUS and LaserSCANNER filter cartridges* on page 11, *Replacing the LaserCOMPACT filter cartridge* on page 12 and *Replacing the LaserFOCUS filter cartridge* on page 13. The color codes for the dates of filter manufacture are given in Table 2 above.
5. Download and save the event log for comparison of smoke readings during normal operation.
6. Record the current airflow (% and raw values) for before and after comparison.
7. Disconnect power to the VESDA detector.
8. Remove dust from around the pipe inlets.
9. Disconnect all pipes from the detector inlet(s) and exhausts then cover them to ensure that no unwanted material can enter the detector.

10. Optional - proceed with this step if there is a low flow fault, a noisy aspirator, excessive or noticeable dust around the exhaust. Remove the detector aspirator (refer to *Replacing LaserPLUS and LaserSCANNER aspirators* on page 17 or *Replacing the LaserCOMPACT aspirator* on page 19) and blow it out with compressed air. Make sure that it is cleaned well away from the detector. The aspirator can collect a significant amount of material in dusty environments, cleaning with compressed air (400 KPa) may produce a large quantity of dust.
11. Remove the filter and clean any visible dust around it.
12. Reconnect all pipes.
13. Re-assemble the detector aspirator and filter.
14. Turn the power supply back on.
15. Allow the VESDA detector to operate for 15 minutes (still in isolate/disable mode).
16. View any faults present and take the appropriate action to fix them.
17. After allowing the detector to operate in a stable and correct state for 15 minutes, review the event log to monitor the background smoke level.
18. Check this value against the Environment Class (*Appendix B: Recommended frequencies for general maintenance and filter cartridge replacement* on page 27) to determine the next scheduled maintenance period.
19. Set the filter timer to reflect the correct environment.
20. Compare the background smoke level with that recorded during previous maintenance visits. While the background smoke level should be the same, it may be different if your environment has changed. If a difference in background smoke level cannot be explained by a change in your environment, you should do one or all of the following: clean the detector, clean the sample pipe network and/or change the filter. If you do any or all of these, you should re-check the background smoke level before proceeding.
21. Compare the before maintenance and after maintenance flow rates. Ideally, the flow rate should be close to 100% for each used pipe. If this is not the case, check the sample pipe network for loose connections or obstructions.
22. If necessary, clean the detector and sample pipe network (refer to *Sample Pipe Network maintenance* on page 7).
23. If the sample pipe network is OK, review the event log. If the event log does not show any unexpected flow faults, normalize the raw airflow.
24. Once the detector and sample pipe network have been serviced, cleaned, tested (for testing instructions, refer to *Post-maintenance testing* on page 9), and are operating fault-free, return the system to its normal operating mode.

2.5 Unscheduled maintenance

There will be occasions where unscheduled detector maintenance is required. Such instances are often the result of fault conditions. Faults can range from minor, "minor low airflow pipe 2", to urgent and must be dealt with by trained and qualified personnel. A full investigation of any reported fault must be conducted, taking into account all possible causes of the fault.

For further information, refer to the VESDA Troubleshooting Guide in the System Design Manual or visit www.xtralis.com/vesda.

2.6 Checking airflow

Every time you visit a site, it is recommended that you check and record the airflow in each sample pipe. The current percentage airflow readings indicate any changes in airflow percentage since the last airflow normalization. These readings may not indicate the absolute increase or decrease in airflow through the sample pipe network. Airflow changes could be a result of one of the following:

- Blockages - within sample pipes, at sample holes or in capillary tubes.
- Leaks - in sample pipes or at pipe junctions.
- Airflow changes - introduced by building ventilation systems, changes in sample pipe network layout or pipe length etc.
- Aspirator degradation.
- Detector contamination.

Check the airflow in each sample pipe by following the instructions below:

1. Check the recent airflow data recorded in the event log. Look for flow faults that endured for a considerable period of time or frequent normalizations. If there are repeated flow faults or detector normalizations in the event log, detector and system cleaning may be required.
2. Fix any problems from the list above, blockages for example. If there are no obvious problems, use VSC to check the raw airflow through the detector (VLP, VLS and VLC only).
3. Compare the raw airflow against previous historical data.

Note: Progressive decreases in the raw airflow readings may indicate a blockage developing inside the sample pipe network. An unexpected reduction of airflow over an extended period of time may indicate that pipe cleaning is urgently required.

Record separate raw airflow results for each sample pipe. When comparing successive raw airflows, ensure that the values compared are for the same sample pipes and check that the pipe network has not changed recently.

The VLF measures flow in liters per minute, not raw airflow, unless it has a VESDAnet card in which case it displays a value that when divided by 100 equates to an airflow in liters per minute.

Refer to the VSC online help for information on how to obtain current raw airflow data for VLP, VLS and VLC products.

2.7 Checking the filter

When checking the filter, compare the date of installation on the filter label with the recommendations in *Appendix B: Recommended frequencies for general maintenance and filter cartridge replacement* on page 27. If in doubt, replace the filter with a new one and record the date on its label.

Important Note: Serious smoke events, such as those indicated by Fire level alarms, can also affect the life expectancy of filter cartridges. Filter cartridges should be replaced after all actual fire events.

3 Power supply maintenance

The VESDA laser detector system power supply should be checked, at least, every six months or as required by local codes and standards. VESDA laser products are designed to operate between 18 VDC and 30 VDC. We recommend, as an absolute minimum, that you check the following:

- Input voltage - from DC power supply to detector.
- Output voltage - from detector to other VESDA devices.
- Backup battery voltage - 24 VDC.
- Charging backup battery voltage - typically 27.6 VDC.

4 Sample Pipe Network maintenance

4.1 Important pre-maintenance preparations

Every six months, you should perform a visual check for any damaged sample pipes or pipe junctions and do repairs as necessary. If damaged or blocked sample pipes go unrepaired, detector flow faults can occur.

Prior to isolating a VESDA system for maintenance, the following important steps must be taken:

1. Inform appropriate supervising authorities about the risk associated with isolating a VESDA Address.
2. Ensure that any ancillary devices, dependent on the detector, are appropriately isolated.



Warning: Inhalation of dust is hazardous to health. Dust build up may contain potentially dangerous toxic materials. All cleaning processes must be suitably modified in such instances to negate the risk from toxic materials. Adequate precautions must be taken to comply with local health and safety regulations.

4.2 Cleaning sample pipes

For environment classes 1 & 2, it is recommended that the sample pipe network be checked every two years. However, your system's environment will affect this so refer to *Appendix B: Recommended frequencies for general maintenance and filter cartridge replacement* on page 27. The scheduled period should be reduced to suit harsh site environments.

Note: Local code guidelines may require more frequent inspections for all classes.

Where possible, sample pipes and their connections should be checked to ensure that the pipe runs are intact and that the network is free of dirt and dust.

Follow the instructions below to clean your sample pipe network:

1. Ensure that detectors are isolated from the monitoring panel and fire suppression systems.
2. Notify the relevant authorities that the work is being performed.
3. Check and record the current airflow for before and after comparison.
4. Disconnect the detector power supply.
5. Remove all pipes from the detector inlet(s) and exhausts then cover them to ensure that no further dust can enter the detector.
6. Ensure that end caps are set firmly in place.
7. Connect a vacuum cleaner to the detector end of each pipe in turn. When turned on, it will extract dust and contaminants that have built up inside the pipes.
8. Alternatively, introduce compressed air (400 KPa for 2 minutes) at the detector end of each pipe in turn to blow dust and contaminants out through the sample holes.

9. Take precautions to ensure that dust is not blown into undesired areas. Ensure that end caps are still set firmly in place.
10. Compare the before and after flow rates. Ideally, the flow should be close to 100% for each used pipe. If this is not the case, the capillaries and detector may need closer inspection. If the sample pipe network appears to be OK, continue with the remainder of this section to determine the cause of the reduced airflow.
11. Once the system has been serviced, cleaned, tested and is operating fault-free, return it to its normal operating mode.

Note: Sites with dirty environments, which require very regular sample and exhaust pipe cleaning, should consider installing automated equipment to assist with regular cleaning schedules.

For more information, refer to Xtralis's Application Note - VESDA Air Sampling for Ducts available on our website at www.xtralis.com.

Note: For in-duct sampling remove the pipe(s) from the duct and follow the cleaning process. Once cleaning is complete, return the pipe(s) to their original angle (usually 45° to the airflow).

4.3 Cleaning sample holes

We suggest that sample holes are cleaned, at least, once every two years. This is a recommended interval for environment classes 1 & 2 but your environment will have an effect on how often sample holes require cleaning, refer to *Appendix B: Recommended frequencies for general maintenance and filter cartridge replacement* on page 27. The scheduled period should be reduced to suit harsh site environments. Cleaning is required to remove any dust build up and to ensure that the in-pipe sample holes are not blocked.

To clean in-pipe sample holes, follow the instructions below:

1. Ensure that detectors are isolated from the monitoring panel and fire suppression systems.
2. Notify the relevant authorities that work is being performed.
3. Check and record the current airflow for before and after comparison.
4. Disconnect the detector power supply.
5. Remove all pipes from the detector inlet(s) and exhausts then cover them to ensure that no further dust can enter the detector.
6. Connect a vacuum cleaner to each in-pipe sampling hole in turn to extract dust and contaminants that have built up.
7. Alternatively, introduce compressed air (400 KPa for 2 minutes) at the detector end of the pipe to blow dust and contaminants out of the sample holes. Take precautions to ensure that dust is not blown into undesired areas.
8. Visually check that the in-pipe sampling holes have a clear air path.
9. Compare the before and after flow rates. Ideally, the flow should be close to 100% for each used pipe. If this is not the case, the capillaries and detector may need closer inspection.
10. If the sample pipe network appears to be OK, continue with the remainder of this section to determine the cause of reduced airflow.
11. Once the system has been serviced, cleaned, tested and is operating fault-free, return it to its normal operating mode.

Note: Sites with dirty environments, which require very regular sample pipe and sample hole cleaning, should consider installing automated equipment to assist with regular cleaning schedules.

4.4 Cleaning capillary tubes

We suggest that capillary tubes be cleaned, at least, once every two years. This is a recommended interval for environment classes 1 & 2 but your system environment will have an effect on how often capillary tubes require cleaning, refer to *Appendix B: Recommended frequencies for general maintenance and filter cartridge replacement* on page 27. The scheduled period should be reduced to suit harsh site environments. Cleaning may be required to remove any dust build up and to ensure that the capillary tubes are not blocked.

To clean capillary tubes, follow the instructions below:

1. Ensure that detectors are isolated from the monitoring panel and fire suppression systems.
2. Notify the relevant authorities that work is being performed.
3. Check and record the current airflow for before and after comparison.
4. Disconnect the detector power supply.
5. Remove all pipes from the detector inlet(s) and exhausts then cover them to ensure that no further dust can enter the detector.
6. Remove the capillary tubes from the sample pipe and unscrew the sampling end pieces, if applicable.
7. Clean out the capillary tubes and sampling end pieces with a vacuum cleaner or compressed air source.
8. Visually check that each part has a clear air path.
9. Reassemble the sampling end pieces, if applicable, and connect them to the capillary tubes.
10. Reconnect the capillary tubes to the sample pipe network, ensuring that there are no kinks. If the sample pipe network is also to be flushed, do not reconnect the capillary tubes until this has occurred.
11. Compare the before and after flow rates. Ideally, the flow should be close to 100% for each used pipe. If this is not the case, the pipe network and detector may need closer inspection.
12. If the sample pipe network appears to be OK, continue with any remaining maintenance tasks to determine the cause of reduced airflow.
13. Once the system has been serviced, cleaned, tested and is operating fault-free, return it to its normal operating mode.

Note: Sites with dirty environments, which require very regular capillary tube cleaning, should consider installing automated equipment to assist with regular cleaning schedules.

5 Post-maintenance testing

Post-maintenance tests should be performed, after a maintenance visit, to determine whether the system is functional. Take the appropriate measures to ensure that this testing does not result in unwanted intervention from response systems, for example, suppression.

Consult your local code guidelines to establish the following:

- The minimum testing required per sample pipe.
- The appropriate alarm threshold per sample pipe.

Here are some examples of possible tests:

- You could create a fault to ensure that it is registered by the detector and monitoring system (for example, remove a pipe to create a high airflow fault).
- You could inject smoke into the last sample hole to see whether it is detected.
- Likewise, you could inject smoke into critical sample holes to see whether it is detected.
- More specifically, you could inject smoke into sample holes only in sections of the pipe network where maintenance has been performed. to check the effectiveness of that maintenance.

With all smoke injections, you need to record transport time, ensure that a significant amount of smoke is registered and that alarm(s) are generated. The alarm thresholds and amount of smoke injected may have an impact on the results. You should compare times with the ASPIRE2 design files, commissioning tests and service history.

Note: Transport time is the time taken (in seconds) for the smoke to travel to the detector. Typically, allowing for small variations, the result should be approximately the same as the ASPIRE2 calculations.

In the event that there is a wide variation between the ASPIRE2 results and the actual smoke test results, you must investigate the following:

1. Check that the sample pipe network matches your ASPIRE2 design.
2. Check that the aspirator speed matches your ASPIRE2 design (VLP and VLS only).
3. Check for any preset alarm delays.
4. Check the sample pipe network for leaks and blockages.

Note: Xtralis does not recommend the use of canned smoke to perform post-maintenance tests. However, if you do use canned smoke, you should ensure that you do the following:

- Read and carefully follow all instructions on the canned smoke product.
- Take all necessary health and safety precautions.
- Avoid inhaling the fumes.
- Avoid spraying the canned smoke directly into the detector or the pipe inlets.
- Avoid prolonged bursts - use in short bursts of less than 2 seconds.

Note: Prolonged use of canned smoke can damage plastic components and the detector itself, thereby, invalidating the detector's warranty.

6 Annual testing

Local code guidelines may state that system and detector tests be conducted on a regular basis. Xtralis recommends that such tests be conducted, at least, annually. However, there are some environments in which it is necessary to conduct maintenance and testing more frequently, refer to *Appendix B: Recommended frequencies for general maintenance and filter cartridge replacement* on page 27.

Note: A sample maintenance and testing log is provided in *Appendix C: Example Of A Typical Maintenance Log* on page 29.

Important Note: Xtralis strongly recommends that all persons who install, commission, service and maintain VESDA systems attend the VESDA accreditation training. Please contact your local Xtralis office for more information.

6.1 Detector tests

Check the following items to ensure that performance is still satisfactory:

1. Recorded faults - If any faults are present, record and rectify them before beginning any maintenance.
2. Power supply - Ensure that the input voltage is within the operating requirements.
3. Backup battery (if installed) - Check that the batteries are fully charged and the charging voltage is functioning correctly.
4. Airflow - Check the airflow for each sample pipe in use. Compare to previous site visit data to ensure that there is no degradation in performance due to pipe blockages, leaks, breaks or contamination.
5. Smoke test - Inject an appropriate level of smoke into the required sampling holes.

6. Record Transport Time - This figure should be consistent with your previous maintenance visit or your original commissioning documentation. Refer to your local standards for allowable variations.
7. Local detector display - Ensure that the detector's front panel display responds appropriately to any faults and smoke levels, within the time specified in your local code guidelines.
8. Relay performance - Ensure that the detector's fire and fault relays are functioning correctly.
9. Remote detector display - Ensure that any associated remote detector displays (if installed) respond appropriately to any faults and smoke levels, within the time specified in your local code guidelines.
10. Record results - Xtralis recommends that you photocopy the sample maintenance log in *Appendix C: Example Of A Typical Maintenance Log* on page 29 and record all results on the copy. Store the log in an appropriate known location on-site.
11. Compare all results to previous recorded tests - Ensure that there is no degradation in performance. If a noticeable change is observed, maintenance of the detector and/or sample pipe network may be necessary.
12. Schedule next visit - Determine the appropriate time for the next site visit by referring to *Appendix B: Recommended frequencies for general maintenance and filter cartridge replacement* on page 27.

6.2 System fire panel notification tests

Your detector alarm and fault tests should register on the monitoring system, within a time frame consistent with local standards. System notification results should be recorded in the detector maintenance log.

7 Replacing detector components

7.1 Replacing LaserPLUS and LaserSCANNER filter cartridges

The service interval of an air filter depends upon the environment. You can use the LCD Programmer or VESDA PC Software guides to change the service interval for filters. The system will generate a minor fault when the filter has reached 80% and an urgent fault when it reaches 120% of its capacity. We recommend that the installation date and replacement date be written on the air filter cartridge label as a physical reminder of when the next service is expected.

Important Note: The detector must have the power turned on while the air filter cartridge is being replaced.

The procedure and diagrams outlined below provide the steps to be followed when replacing the air filter cartridge in the VESDA LaserPLUS (VLP) and VESDA LaserSCANNER (VLS) detectors:

1. Slide down and remove the air filter cover (A) in Figure 1 below.
2. Unscrew the recessed phillips head screw (B) in Figure 1 below.

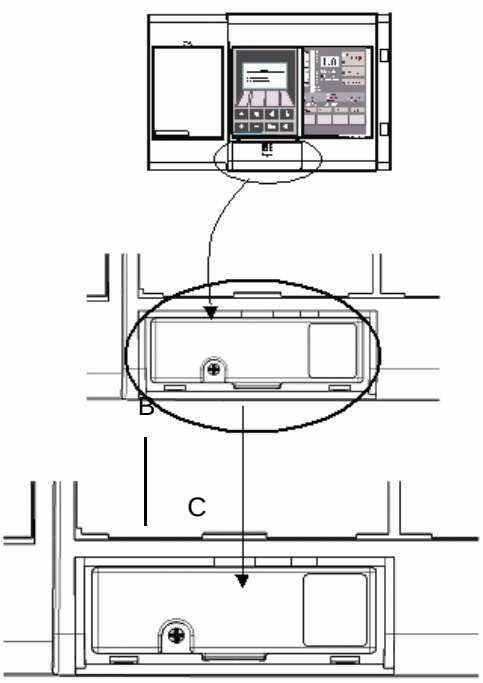


Figure 1: Replacing air filters in VLP and VLS detectors

3. Pull out the air filter cartridge (C) in Figure 1 above. This will stop the aspirator. If the aspirator does not stop, replace the filter switch.
4. Insert the replacement air filter cartridge (VSP-005).
5. Tighten the filter screw.
6. Replace the air filter cover.
7. Reset the filter counter using either the LCD Programmer or a PC running VSC/VSM4.

7.2 Replacing the LaserCOMPACT filter cartridge

The service interval of an air filter depends upon the environment. You can use the LCD Programmer or VESDA PC Software guides to change the service interval for filters. The system will generate a minor fault when the filter has reached 80% and an urgent fault when it reaches 120% of its capacity. We recommend that the installation date and replacement date are written on the air filter cartridge label as a physical reminder of when the next service is expected.

Important Note: The detector must have the power turned on when the air filter cartridge is being replaced.

The procedure and diagrams outlined below provide the steps to be followed when replacing the air filter cartridge in the VESDA LaserCOMPACT (VLC) detector:

1. Open the front cover
2. Locate the air filter cartridge (A), inside the detector compartment, as indicated in Figure 2 below.
3. Undo the recessed phillips head filter screw (B) in Figure 2 below.
4. Lift out the air filter cartridge.

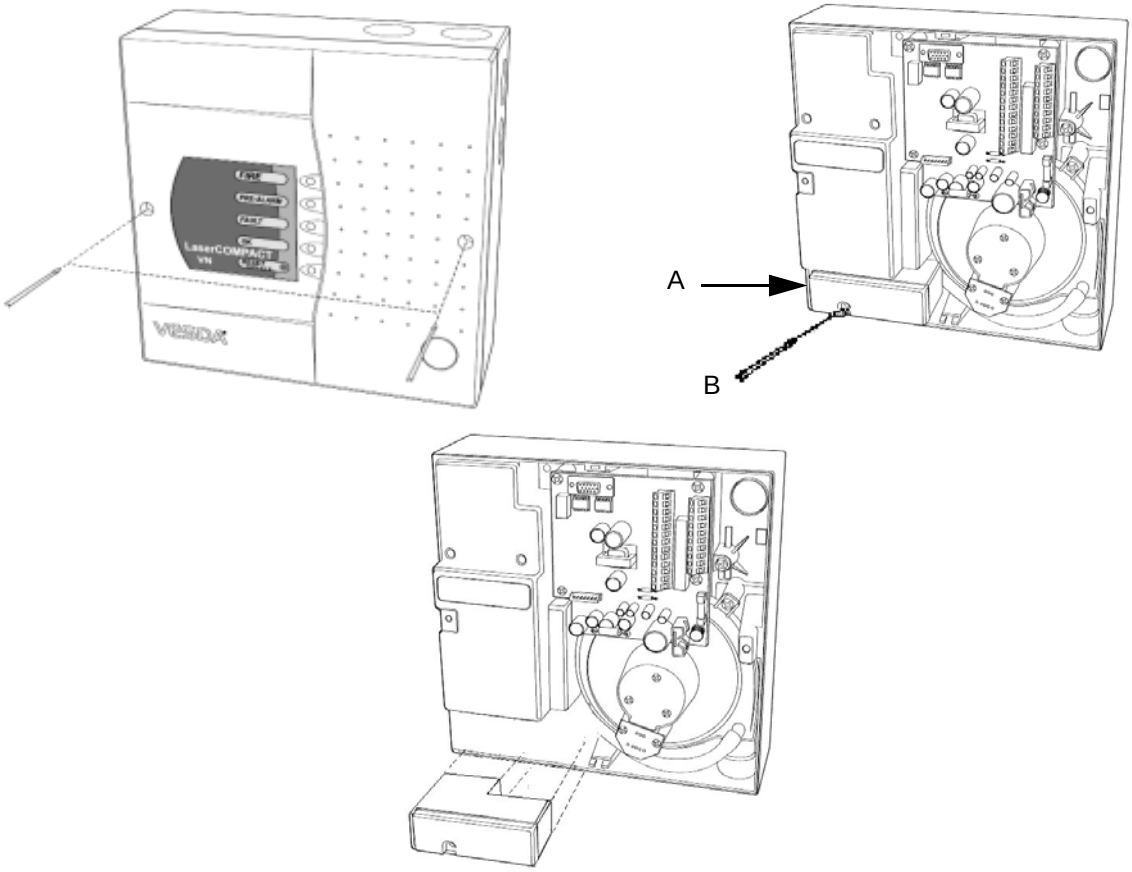


Figure 2: Replacing the air filter cartridge in VLC detectors

5. Insert a new air filter cartridge (A) in Figure 2 above.
6. Tighten the filter screw (B) in Figure 2 above.
7. Reset the filter counter by connecting a LCD programmer or a PC with VSC software to the programming socket.
8. Using a PC only (applicable to RO version) or a PC with a PC-Link HLI (Applicable to VN version only), reset the filter by entering your user level and PIN number to Log ON to the detector then Initiate the Reset Filter Settings command located under the device menu.
9. Close up the detector.

7.3 Replacing the LaserFOCUS filter cartridge

The VESDA LaserFOCUS (VLF) detector uses a disposable dual stage air filter cartridge. This filter removes dust contamination from sampled air and provides a clean air bleed to preserve the detector chamber optics. The detector constantly monitors filter efficiency. To maintain the operational integrity of the smoke detector, it is recommended that the filter be replaced every 2 years or when a filter fault occurs. More frequent filter replacement is necessary in environments where there are high levels of contamination.

A fault is raised on the detector, when the filter needs to be replaced. During the replacement process, the detector must be told that a new filter has been installed.

Note: Prior to any work or maintenance being carried out on the VESDA VLF, take the necessary steps to advise the monitoring authority that power may be removed and that the system will be disabled.

Ensure that the area surrounding the filter is clear of dirt and debris, prior to

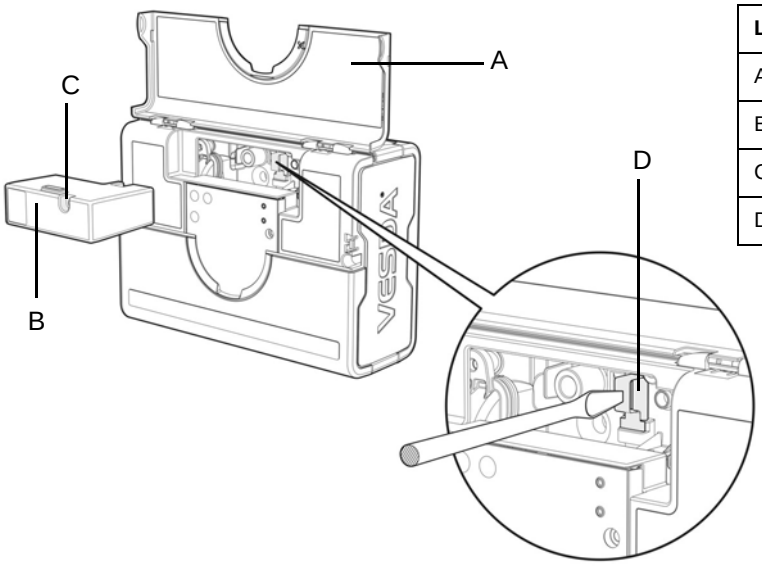
replacement.

The filter is for single use only, it cannot be cleaned and re-used.

Ensure that the detector remains powered up during filter replacement and that a new filter cartridge is available:

The procedure and diagrams outlined below provide the steps to be followed when replacing the air filter cartridge in the VLF detector:

1. Push in the security tab and lift up the field service access door (A) in Figure 3 below.
2. Set the detector to 'Standby' mode by pressing the Disable button for 6 seconds. The Disabled LED begins to flash rapidly. After releasing the Disable button the disabled LED will flash more slowly.
3. Undo the recessed retaining screw (C) and pull out the old filter (B) in Figure 3 below.



Legend	
A	Field service access door
B	Dual stage air filter cartridge
C	Retaining screw
D	Filter switch

Figure 3: Replacing the air filter cartridge in a VLF detector

4. Using your finger, firmly press the filter switch (D), in the filter recess of the detector, 5 times within 5 seconds to confirm with the detector that a new filter is about to be installed (see inset). A LED next to the serial interface will flash each time you push the filter switch, and will continue flashing once you have successfully pressed the switch 5 times in 5 seconds.
5. Insert the new filter (VSP-005) and tighten the retaining screw.
6. Press the Disable button for 6 seconds to return the detector to normal operating mode.
7. Record the filter replacement date on the filter.
8. Close the field service access door.

7.4 Replacing LaserPLUS and LaserSCANNER chassis

You must disassemble the VESDA LaserPLUS (VLP) or VESDA LaserSCANNER (VLS) detectors, before replacing their chassis, as follows:

1. Isolate the detector 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 output from the detector to a fire alarm panel or monitoring system.
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. Turn off the power by disconnecting the power cables.
4. Remove the front panel by first opening the cover plate and screw covers, then unscrewing the cover plate screws as shown in Figure 4 below.

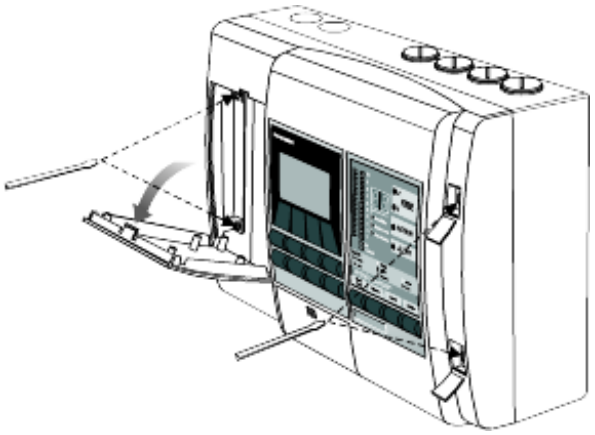


Figure 4: Removing the VLP or VLS front cover for chassis replacement

5. Disconnect the data cables that connect the chassis assembly to the termination card. These include the front panel modules (if fitted) and manifold (behind chassis). Refer to Figure 5, *"Removing data cables for VLP or VLS chassis replacement,"* on page 15.

Important Note: Performing this step with live power can result in lost detector calibration data. Should this occur, detector warranties shall be void and service charges will be incurred.

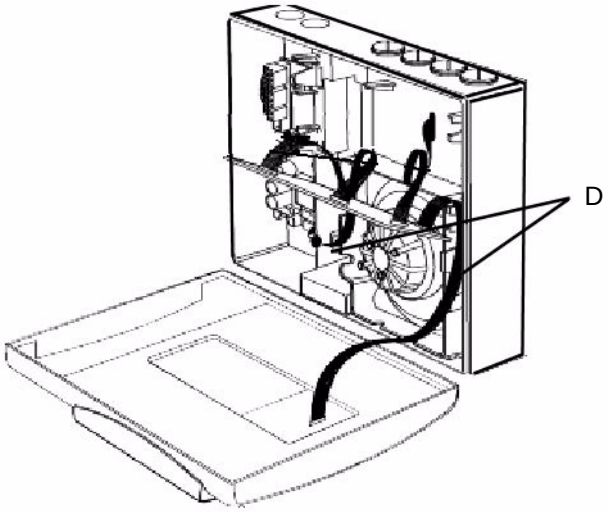


Figure 5: Removing data cables for VLP or VLS chassis replacement

6. Unscrew the 2 recessed retaining screws (D) in the Figure 5 above.
7. Remove the 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 if necessary. Refer to Figure 6 below.

Note: The part number for the VLP chassis is VSP-006; for the VLS chassis, the part number is VSP-009.

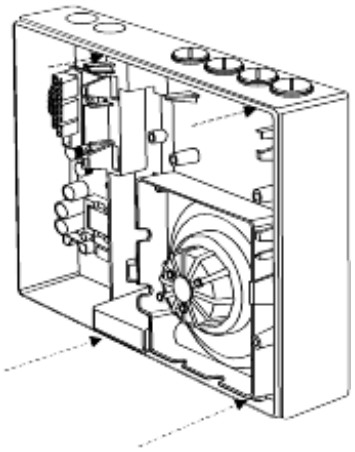


Figure 6: Removing the VLP or VLS chassis

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

Note: The detection 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.

8. Disconnect the flow sensor lead.
9. Unscrew the manifold retaining screws.
10. Remove the Manifold by sliding it downward, away from the pipe network as shown in Figure 7.

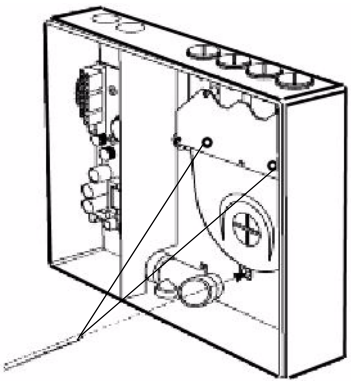


Figure 7: Removing Pipe Inlet Manifold during VLP and VLS chassis replacement

11. Attach the replacement Manifold and Chassis by reversing the procedure above.

Note: Ensure that power is turned off before reconnecting Data cables. All Data cables must be connected properly before power is turned on. Failure to observe this requirement may cause data corruption that requires factory re-calibration.

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.

7.5 Replacing LaserPLUS and LaserSCANNER aspirators

When replacing the VESDA LaserPLUS (VLP) or VESDA LaserSCANNER (VLS) detector aspirators, follow the instructions below:

1. Isolate and power down the detector.
2. Open the front cover.
3. Locate and unplug the cable loom that connects from the head processor card (HPC) to one of the modules located on the front panel. Mark out this connector position, if unsure about the cabling.
4. Remove the air filter cartridge, refer to Figure 7, *"Removing Pipe Inlet Manifold during VLP and VLS chassis replacement,"* on page 16.

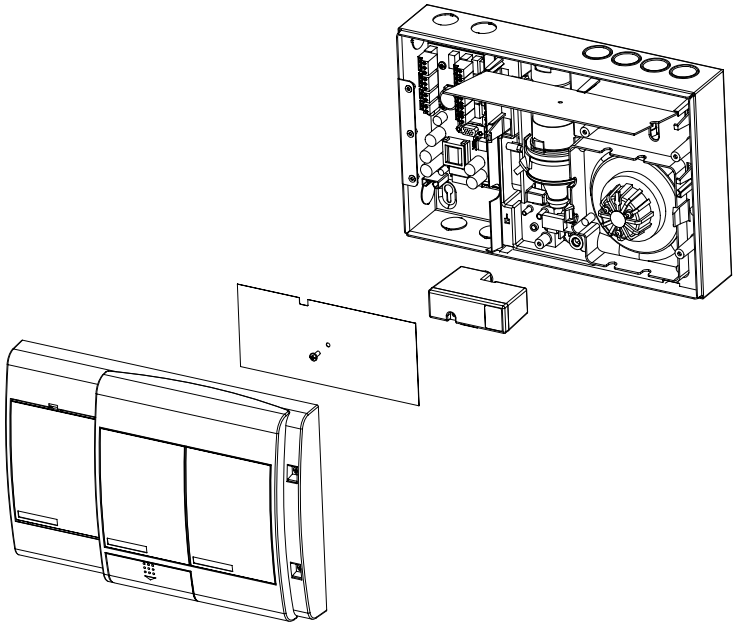


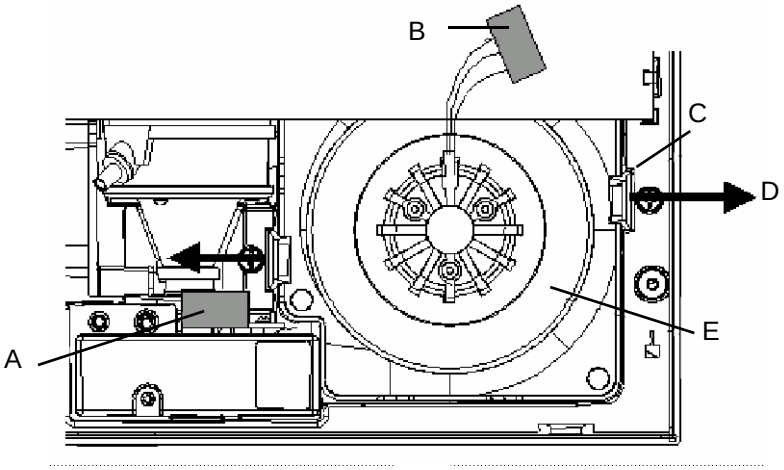
Figure 8: Removing the Air Filter Cartridge for VLP or VLS aspirator replacement

5. Remove the HPCs securing screw.



Warning: Hold the HPC at the edges. Static charges may damage it.

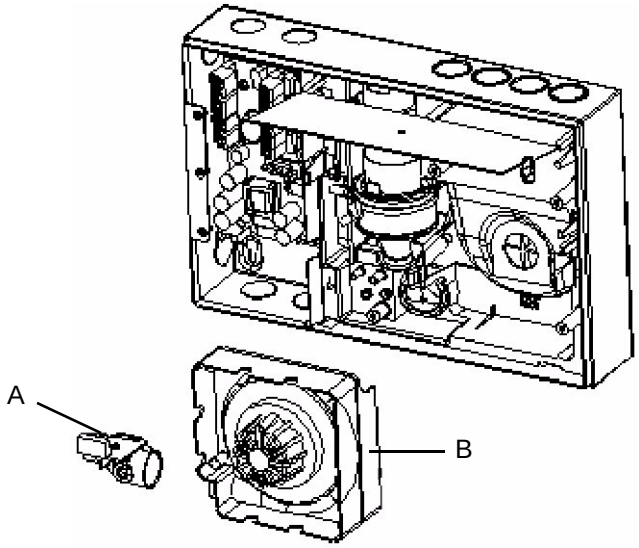
6. Remove the brown insulating sheet and lift up the HPC.
7. Locate the aspirator cable loom (red, white and blue wires) and disconnect the connector from the HPC.



Legend	
A	Filter switch connector socket
B	Aspirator loom connector
C	Aspirator locking fingers
D	Move both locking fingers outwards
E	Aspirator (Lift upwards)

Figure 9: Removing the HPC and Disconnecting the aspirator cable loom

8. Locate the two plastic fingers securing the aspirator to the chassis (D) in Figure 9 above.
9. Push fingers outwards (E) and lift the aspirator out.
10. Remove the exhaust pipe elbow and filter card assembly (A) from the aspirator (B) as shown in Figure 10, *"Removing the Exhaust Pipe Elbow and Aspirator,"* on page 18.



Legend	
A	Exhaust pipe elbow with filter card switch
B	Aspirator

Figure 10: Removing the Exhaust Pipe Elbow and Aspirator

11. Reattach the exhaust pipe elbow and filter card assembly (A) to the aspirator (B) exhaust outlet as shown in Figure 10 above.
12. Wipe the manifold outlet flange surface if dirty.
13. Slide the aspirator between the fingers until fingers lock over aspirator. Check that the aspirator does not come off when lifted.
14. Reconnect the aspirator cable loom to the cable socket on the HPC.
15. Secure the HPC to the chassis, ensuring that the card locks under the plastic fingers.
16. Place the insulating sheet over the HPC and secure it with the screw.
17. Re-attach the air filter cartridge.
18. Re-connect the cable loom to the module on the front panel.
19. Check that all wires are secured to the connectors or terminals.
20. Power up the detector and check the aspirator is running.

21. Close the detector, refer to Figure 4, *“Removing the VLP or VLS front cover for chassis replacement,”* on page 15.

7.6 Replacing the LaserCOMPACT aspirator

Aspirators, in VESDA LaserCOMPACT (VLC) detectors are replaced as follows:

1. Isolate and power down the detector.
2. Remove the four screws securing the termination card.
3. Disconnect the aspirator cable loom from the connector on the aspirator.
4. Gently pull the termination card out, away from the interface card (connected behind). Take care not to dislodge any wires connected to the termination card and leave it suspended by these wires.
5. Remove the air hose from the aspirator pipe by pulling.
6. Undo the three Phillips head screws securing the aspirator; these screws are captive.
7. Turn the aspirator anti-clockwise, using the exhaust port as the pivot point.
8. Push the aspirator upward to remove it.

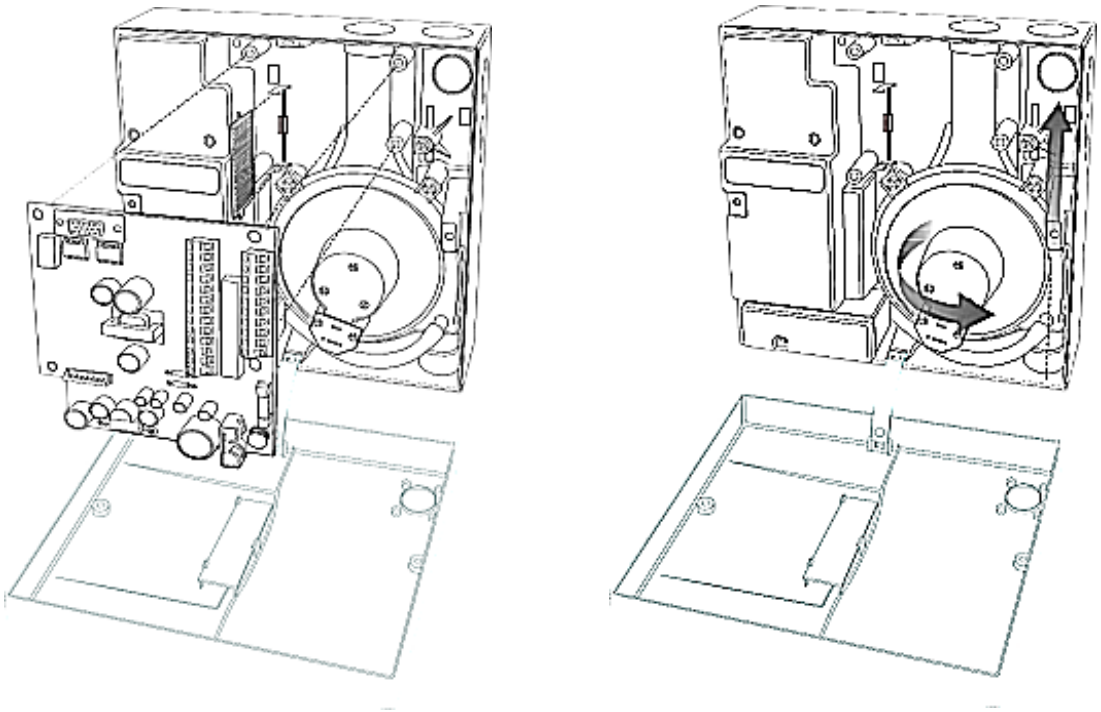


Figure 11: Replacing the Aspirator in a VLC detector

9. Check that the new aspirator has a gasket on the inlet flange and three attached screws.
10. Wipe the manifold outlet flange surface.
11. Secure the aspirator with the three screws.
12. Reconnect the previously removed air hose to the pipe on the aspirator. Ensure a tight fit over the pipe.
13. Reinsert the termination card into the interface card.
14. Secure the termination card with the four screws.
15. Connect the aspirator cable connector to the socket on the aspirator; the connector is keyed and can only be inserted one way.
16. Check that all wires are secured to their connectors or terminals.
17. Power up the detector and check that the aspirator is running.

18. Resolve all Fault conditions.
19. Close the detector.
20. Reset Isolate to normal conditions and check that the airflow % has returned to the level it was at before Disassembly.

7.7 Replacing the LaserFOCUS aspirator

Important Note: Prior to replacing the aspirator, advise the monitoring authority that power is to be removed and the system disabled.



Caution: Electrostatic discharge precautions need to be taken, prior to removing the front cover from the detector, otherwise damage may occur.

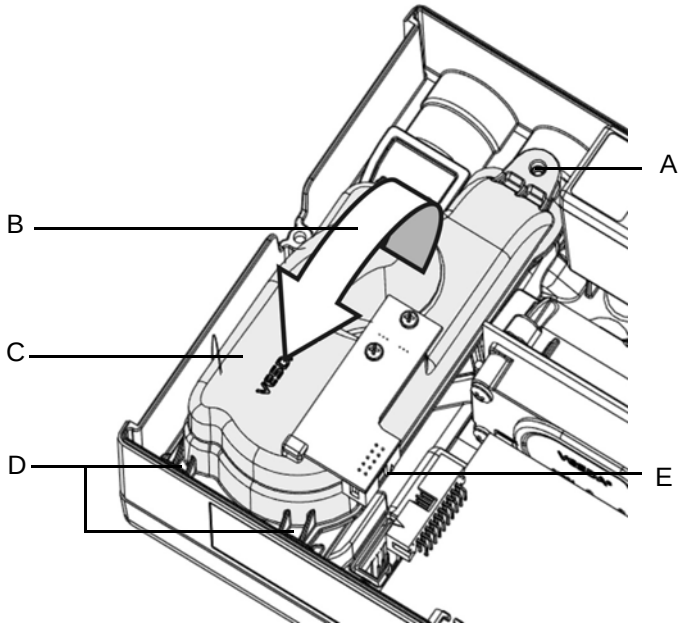
The following Aspirator removal instructions assume normal mounting, refer to Figure 12 below:

1. Disconnect power to the detector.
2. Push in the security tab and lift up the field service access door.
3. Unscrew the two front cover retaining screws, lift and swing down the front cover.
4. Only disconnect the fan wiring loom from the connection point (E) at the aspirator.
5. Undo the retaining screw on the aspirator (A).
6. Swing the aspirator out then lift and remove it from the detector.

Note: Any time the aspirator is removed ensure that the area surrounding it is clear of dirt and debris before it is replace.

Care must be taken, during aspirator replacement. The aspirator must be correctly seated; this is essential to ensure that gaskets are not damaged or dislodged from the underside of the aspirator.

7. Clip the aspirator (VSP-715) into the retaining clip (D) and swing it back into the detector.
8. Tighten the retaining screw (A) but do not over tighten.
9. Reconnect the fan loom to the aspirator (E).
10. Replace the front cover and screw it into place.
11. Close the field service access door.
12. Reconnect the power to the detector.



Legend	
A	Aspirator securing screw
B	Swing aspirator out to remove
C	Aspirator
D	Retaining clip points
E	Fan loom connector **must** be disconnected here

Figure 12: Replacing the aspirator in a VLF detector

7.8 Replacing LaserPLUS and LaserSCANNER termination cards

Important Note: Disconnect the detector power supply before commencing replacement of the termination card. Only reconnect the 24 VDC power supply once the replacement termination card is secured.

Follow the instructions below to replace the VLP or VLS termination cards.

1. Mark out the wire positions on each terminal socket before removing them.
2. Remove all terminal plugs (C) from sockets, leaving the wires attached to the plugs, refer to Figure 13 below.
3. Remove the 10 wire and 13 wire cable looms from their socket (B) in Figure 13 below.
4. Remove the five Phillips head screws (A) in Figure 13 below.
5. Remove the termination card.
6. Attach the Termination Card with five Phillips head screws (A).
7. Reattach the 10 wire and 13 wire cable looms to the sockets. (B) The connectors can only be inserted into the socket one way. Turn the connector around if the connector does not fit into its socket.
8. Reconnect the terminal plugs to their sockets, ensuring the plugs are connected to their correct socket (C).

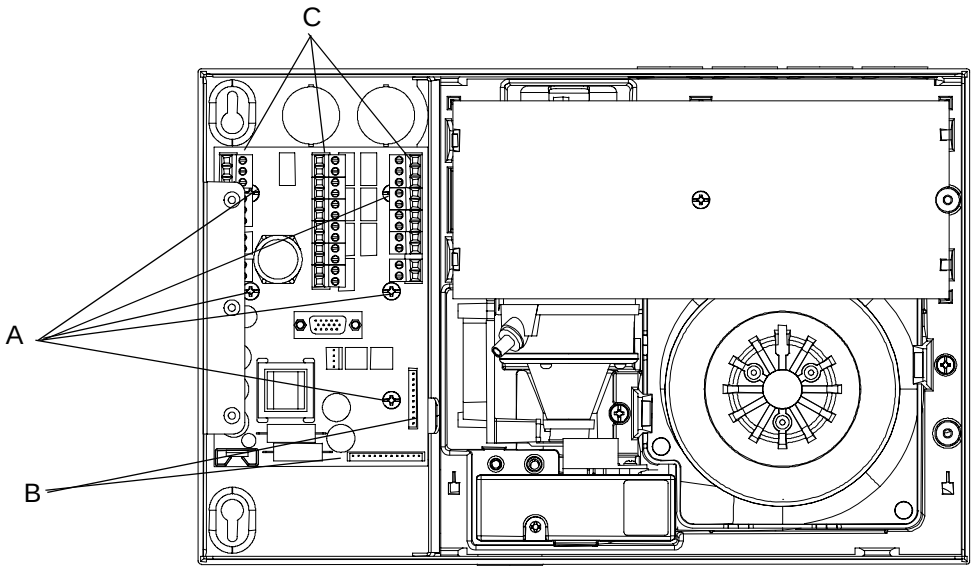


Figure 13: Replacing VLP/VLS head termination cards

7.9 Replacing the LaserCOMPACT termination card

Follow the instructions below to replace the VESDA LaserCOMPACT (VLC) detector termination card:

1. Remove the front cover of the detector (refer to Figure 2, *"Replacing the air filter cartridge in VLC detectors,"* on page 13).
2. Isolate and power down the detector before you begin.
3. Record all wiring connections to the termination card so that you can connect the replacement card properly.
4. Disconnect the wiring for power, communications and relays from the 45 deg screw terminals.
5. Remove the four screws securing the termination card.
6. Disconnect the 3-way aspirator cable loom from the connector on the termination card.
7. Disconnect the 5-way front panel LED cable from the termination card.
8. Gently pull the termination card away from the interface card (connected behind).
9. Secure the replacement termination card with the four screws.
10. Reconnect the 3-way aspirator cable loom to the connector on the termination card.
11. Reconnect the 5-way front panel LED cable to the termination card.

Note: Both the 3-way aspirator cable and the 5-way front panel LED cable are keyed so that they can only be connected in one orientation.

12. Reconnect the wiring for power, communications and relays to the 45 deg screw terminals.
13. Check that all wires are secured to their correct terminals.
14. Power up the detector and check that the aspirator is running.
15. Resolve all Fault conditions.
16. Close the detector.
17. Reset Isolate to normal conditions and check that the airflow % has returned to the level it was at before disassembly.

7.10 Replacing LaserPLUS and LaserSCANNER detector modules

Important Note: Isolate and power down the detector before you begin.

Follow the instructions below to replace VESDA LaserPLUS (VLP) and VESDA LaserSCANNER (VLS) detector modules:

1. Insert a screwdriver at the top between the Module and the Front Cover (refer to Figure 4, *"Removing the VLP or VLS front cover for chassis replacement,"* on page 15),
2. Gently remove the module from the front cover by levering the screwdriver.
3. Disconnect the wire loom from the module processor card.
4. Connect the wire loom to the respective 10 or 11 way connector(s) on the module processor card.
5. Secure the modules to the front cover by gently snapping the module into place ensuring that none of the EMC Screening is trapped.
6. Power up the detector.

7.11 Inspecting and cleaning LaserSCANNER valves

The VESDA LaserSCANNER has four valves that open and close to allow the detector to draw air from one sample pipe at a time. Since the air that reaches the valves has not been filtered, it may contain dust, dirt, and background pollution such as soot or coal dust.

To inspect and clean VLS valves, follow the instructions below:

1. Remove the pipes leading into the VLS detector.
2. Press, and hold down, the Silence/Scan button on the front of your VLS detector. The valve scan test will start. If your VLS does not have a Silence/Scan button, use your PC and VESDA System Configurator (VSC) to start the valve scan test (step 3 to 6).
3. Logon to VSC
4. Select the VESDA Laser Scanner detector from the Device Tree
5. Select Device from the Main Menu
6. Select Start Manual Scan Test. A dialogue box confirms that you wish to proceed with the test. Select Yes to continue.
7. Once the valve scan test is complete, look inside the inlet ports to see that the valves are periodically opening and closing. Also look for evidence of a build-up of dirt.
8. If dirt is found, you will need to remove the chassis before flushing the valves. Refer to *Replacing LaserPLUS and LaserSCANNER chassis* on page 14 for details.
9. Remove the air inlet manifold and clean it with compressed air. The manifold is sensitive so do not clean with more than 87 KPa (6 bar) compressed air.
10. Once clean, reassemble the detector and perform a test to ensure system integrity.

Appendix A: Laser Products Parts List

Category	Part number	Description
VLP	VSP-000	Blank plate, non-EMC painted, with VESDA logo
	VSP-001	Programmer Module
	VSP-002	Display Module
	VSP-005	Filter Cartridge
	VSP-006	VLP Detector Chassis Assembly complete with Manifold
	VSP-013	Detector Cover Assembly complete with EMC shields
	VSP-014	7-relay Head Termination Card (HTC7)
	VSP-015	VLP Detector Aspirator Assembly
	VSP-019	Filter Cover
	VSP-021	Imperial Pipe Adaptors (25 mm to 27 mm) (4 off) (US only)
	VSP-100	Blank plate with FIRE 1 & OK LEDs, non-EMC painted, with VESDAlogo
	VSP-101	Blank plate with French FIRE 1 & Fault (FF) LEDs, non-EMC painted, with Printed logo
	VSP-200	Blank plate, EMC painted, without VESDA logo
	VSP-540	Exhaust Deflector (black)
VLS	VSP-000	Blank plate, non-EMC painted, with VESDA logo
	VSP-001	Programmer Module
	VSP-004	Scanner Display Module
	VSP-005	Filter Cartridge
	VSP-009	Scanner Chassis Assembly complete with Manifold
	VSP-013	Detector Cover Assembly complete with EMC shields
	VSP-014	7-relay Head Termination Card (HTC7)
	VSP-015	VLP Detector Aspirator Assembly
	VSP-016	12-relay Head Termination Card (HTC12)
	VSP-019	Filter Cover
	VSP-021	Imperial Pipe Adaptors (25 mm to 27 mm) (4 off) (US only)
	VSP-100	Blank plate with FIRE 1 & OK LEDs, non-EMC painted, with VESDAlogo
	VSP-101	Blank plate with French FIRE 1 & Fault (FF) LEDs, non-EMCpainted, with Printed logo
	VSP-200	Blank plate, EMC painted, without VESDA logo
	VSP-540	Exhaust Deflector (black)

Category	Part number	Description
VLC	VSP-005	Filter Cartridge
	VSP-021	Imperial Pipe Adaptors (25 mm to 27 mm) (4 off) (US only)
	VSP-501	VLC Aspirator
	VSP-502	VLC VN Remote Display Module
	VSP-509	VESDAlink™ RS232 9-pin to 9-pin Serial Cable
	VSP-510	VLC RO Termination Card (CTC-RO)
	VSP-515	VLC VN Termination Card (CTC-VN)
	VSP-540	Exhaust Deflector (black)
VLF	VSP-005	Filter Cartridge
	VSP-021	Imperial Pipe Adaptors (25 mm to 27 mm) (4 off) (US only)
	VSP-540	Exhaust Deflector (black)
	VSP-702	VLF Remote Display Module
	VSP-715	VLF Aspirator
Modules	VSP-001	Programmer Module
	VSP-002	Display Module
	VSP-004	Scanner Display Module
	VSP-007	0-relay Remote termination card (RTC0)
	VSP-008	7-relay Remote termination card (RTC7)
	VSP-016	12-relay Head Termination Card (HTC12)
	VSP-200	Blank plate, EMC painted, without VESDA logo
	VSP-208	12-relay Remote termination card (RTC12)
	VSP-300	Blank plate, non-EMC painted, without VESDA logo
Accessories	VSP-003	VESDAnet Socket Kit
	VSP-102	Detector Relay Processor Module (Blank + DRP)
	VSP-103	Scanner Relay Processor Module (Blank + DRP)
	VSP-200	Blank plate, EMC painted, without VESDA logo
	VSP-300	Blank plate, non-EMC painted, without VESDA logo

Appendix B: Recommended frequencies for general maintenance and filter cartridge replacement

Environment Class	Typical Application	Background Smoke Level	Recommended Filter Replacement Frequency	Recommended Maintenance Period	Factors that may affect filter replacement frequency. Recommendations of use
1	Fully enclosed, and strictly no leakage, fully air-conditioned, usually with HEPA filters fitted, strictly maintained to high standards of cleanliness such as Clean Room classification 1, 10,100 in accordance with US Federal Standard 209D, computer rooms with restricted access, medical facilities with positive pressure, installations within medical and semiconductor equipment etc.	Usually less than 0.006% obs/m (average) {<0.002% obs/ft} (average)	At least every 60 months	At least every 24 months (code requirements typically call for 12 month Service Intervals	Higher clean room classification, protection of other areas such as wet bench, subject to contamination due to frequent access or minor building leakage
2	Fully enclosed and usually air-conditioned with some filters fitted, high airflow extraction systems or standalone AHU, routinely maintained to acceptable health recommendations for occupants. Frequent access. May be multi-function facility. General office building, telecommunication base station, equipment switch rooms, shopping mall, heritage building, churches, document storage and general warehouse type building (including cold storages) with high ceiling.	Usually between 0.006-0.009% obs/m {0.002-0.003% obs/ft}	At least every 36 months	At least every 24 months (code requirements typically call for 12 month Service Intervals)	Frequent access and/or excessive building leakage/ doors connected to a highly polluted ambient environment, infrequent HVAC maintenance, high relative humidity, activities such as cooking, production, dusty spaces like ceiling void, suspension floor, regular wash downs.
3	Similar to Environment Class 2 in countries with high levels of pollution and no filtration of outside air. Facilities with light industrial sites, manufacturing and processing without noticeable airborne particles, prison cells, etc.	Usually less than 0.015% obs/m {<0.005% obs/ft}	At least every 24 months	At least every 12 months	Low ceiling, higher airborne particles level, high relative humidity. May require water trap in high humidity climate.
4	Partially enclosed, no air-conditioning but may use extraction system from time to time.Usually industrial sites with noticeable air pollution, loading bays, dusty production, underground platform, equipment rooms, facilities using natural air ventilation.	Usually less than 0.03% obs/m {<0.01% obs/ft}	At least every 18 months	At least every 12 months	High relative humidity, frequent wash-down.May require water-trap in high humidity climate.
5	Open environments, airborne particle clearly visible, sometime require wash-down to maintain acceptable health standard for occupants. May use extensive stage smoke or fog.Applications like amusement park rides, coal fired power station, fertiliser factory, waste-treatment, tunnels, bus terminals, etc.	Usually above 0.03% obs/m {>0.01% obs/ft}	At least every 12 months	At least every 6 months	Refer to Class 6 (Special Case). May require water-trap in high humidity climate.

Environment Class	Typical Application	Background Smoke Level	Recommended Filter Replacement Frequency	Recommended Maintenance Period	Factors that may affect filter replacement frequency. Recommendations of use
6(Special Cases)	Usually fits within "High" and "Extreme" definitions. Regular fumigation (such as tobacco storage), corrosive, radiative, irregular process, high level of fine dusty environment such ascement, textile, welding, oily, steamy, etc.	Varied	Closely monitor for the first 3 to 6 months to develop a filter replacement guideline	Closely monitor for the first 3 to 6 months to develop a maintenance schedule	Consult with Risk Manager, refer to local codes, standards and regulations to ensure compliance.Regular smoke tests are required. May require water-trap in high humidity climate.

Appendix C: Example Of A Typical Maintenance Log

Customer:		Date of visit:	
Site:		Technician's name:	
Service company name:		Address:	
		Phone number:	
Visit type:	scheduled / fault call out / annual test (circle appropriate visit)		

VESDA detector type: Detector serial no.:

Detector location:

Before you record any more information:	
1. Record airflow	use table below
2. Download and save event log via VSC	Yes / No
3. Download and save configuration file via VSC	Yes / No
4. Give a copy of event log and configuration file to site manager	Yes / No

Flow (before):	%	actual	Flow (after):	%	actual
Pipe 1			Pipe 1		
Pipe 2			Pipe 2		
Pipe 3			Pipe 3		
Pipe 4			Pipe 4		

Detector faults present:	Actions to fix:

Parts replaced:		Clean pipes:	
filter	Yes / No	pipe flush	Yes / No
others		in-pipe sampling holes	Yes / No
		capillaries	Yes / No

Have you done the following?		Comments

reviewed service history	Yes / No	
checked power supply/UPS	Yes / No	
checked battery backup	Yes / No	
checked battery charging	Yes / No	
tested fire alarm and fault notification at detector	Yes / No	
tested fire alarm and fault notification at monitoring system	Yes / No	
compared current results to commissioning data	Yes / No	
returned the system to normal operation mode	Yes / No	

Record any other activities undertaken:

Circle the detector's environment class:	1	2	3	4	5	6
Record filter replacement frequency:	months		Exp. Date			
Record detector maintenance period:	months		Next visit:			

Signatures:	
Technician:	Site Manager:
Date:	Date: