PROTECTING XTRALIS ASPIRATED SMOKE DETECTORS FROM INSECT INFESTATION APPLICATION NOTE

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Preface

This Application Note outlines the effective use of an Inline Mesh Strainer for the prevention of insect damage to Xtralis Aspirated Smoke Detectors.

Aspirating Smoke Detectors (ASD) have the significant advantage of flexibility in pipe arrangements, which allows for special components to be used to solve site specific problems. This Application Note addresses a case of infestation of tiny insects that may result in a detection chamber fault or possible false alarm. The addition of a commercially available inline mesh strainer can prevent this issue and preserve the long operational life of the detector.

This document provides guidance to designers and users of Xtralis ASD systems on the consideration and use of such low-risk optional components and more specifically, to define a safe “Code of Practice” for their use – without the need to individually list specific components within the approvals documentation and certificates.

This Application Note describes the use of an Inline Mesh Strainer in conjunction with a VSP-850. Additional information is available in the following application notes:

- 17785 - Xtralis In-Line Filter Application Note (VSP-805 Inline Filter).
- 18336 - Xtralis Open-Flow In-Line Components Application Note

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1 Introduction

In some areas of the world, there are very tiny mosquito insects measuring about 0.9mm x 0.1mm that can burrow through filter materials within the smoke detector and reach the detection chamber, which may then cause F840 of VESDA-E smoke detectors. Insect infestation of this type is a rare site-specific condition and is not applicable to most indoor installation sites. To protect Xtralis detectors from these tiny insects, this Application Note describes the addition of an inline mesh strainer after the in-line filter (VSP-850) as an application solution for affected sites. This practice adds maintenance to the installed system and therefore is only advised where this type of insect infestation is likely.

2 In-Line Mesh Strainer Assembly

Figure 1: In-Line Mesh Strainer Assembly

Table 1: In-Line Mesh Strainer Assembly Parts

Part	Brand	Model	Suggested Source
Philmac 25mm x 1" Metric Poly x FI BSP Pipe End Connector	Philmac	70783300	https://www.bunnings.com.au/philmac-25mm-x-1-metric-poly-x-fi-bsp-pipe-end-connector_p4813793?store=6395
Rain Bird - RBY100MPTX - 1 in. Inline WYE Filter	Rain Bird	RBY100MPTX	1. (Australia) https://smartwatershop.com.au/ 2. (US) https://www.plumbersstock.com/rainbird-rby100mptx-x14052-1-inline-male-x-male-wye-filter-200-mesh-screen.html
Rain Bird RBY200SSMX 200 (75 micron) Mesh Stainless Steel Replacement Screen	Rain Bird	RBY200SSMX	

3 Flow Impedance / Smoke Transmission

The inclusion of an in-line mesh strainer on the VESDA sampling pipe will affect airflow and smoke transmission which needs consideration. Detailed information to undertake this assessment is available in the *Xtralis Open-Flow In-Line Components Application Note (Doc. No. 18336)*.

The effect on airflow for the combined in-line mesh strainer and VSP-850 in-line filter is shown in Figure 2. The in-line mesh strainer does not have a significant effect on smoke when the system is properly maintained.

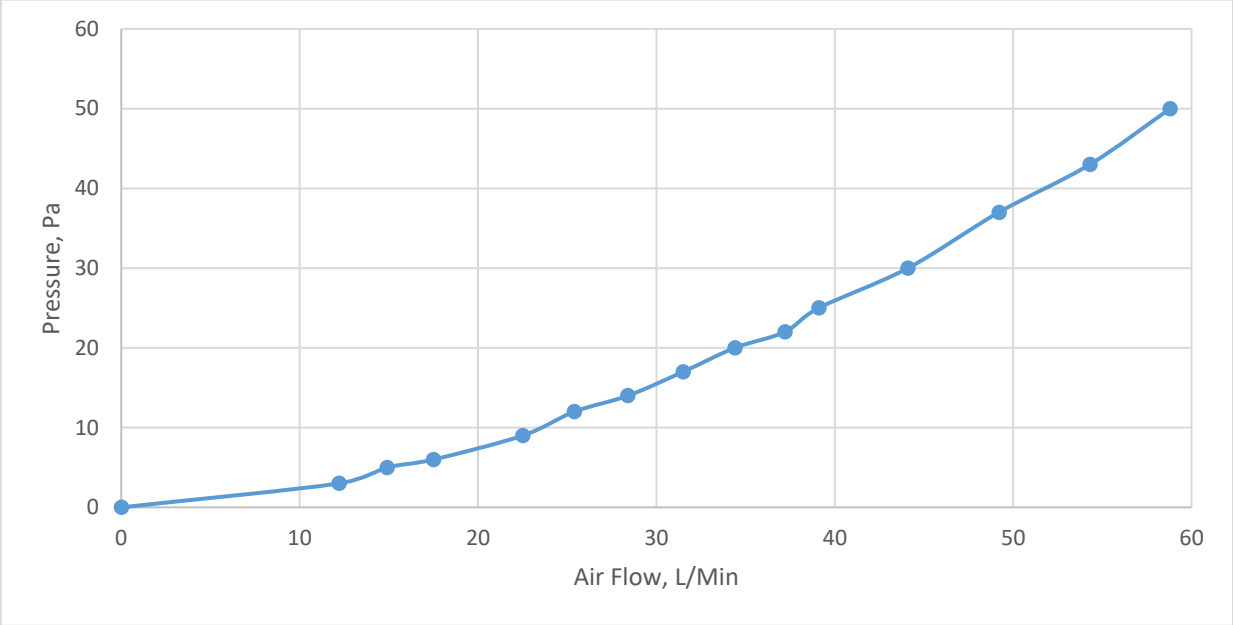

Figure 2: In-Line Mesh Strainer Impedance Curve

4 Installation

- In-line mesh strainer must be installed after the in-line filter (VSP-850) along the flow direction, that is in the direction towards the detector (see Figure 3 for an image reference of installation).
- Note that strainers are too large to be mounted next to each other on adjacent pipe and may need to be staggered for installation, as shown in Figure 3.
- There must be no sample hole between the in-line mesh strainer and the in-line filter (VSP-850).
- It is recommended that both the mesh strainer and mesh filter be co-located close to the detector for convenient servicing.
- Thread sealing compound or PTFE tape is required to seal the threads of the RBY100MPTX filter, do not apply tape or compound to the filter cap as that is sealed with an o-ring.

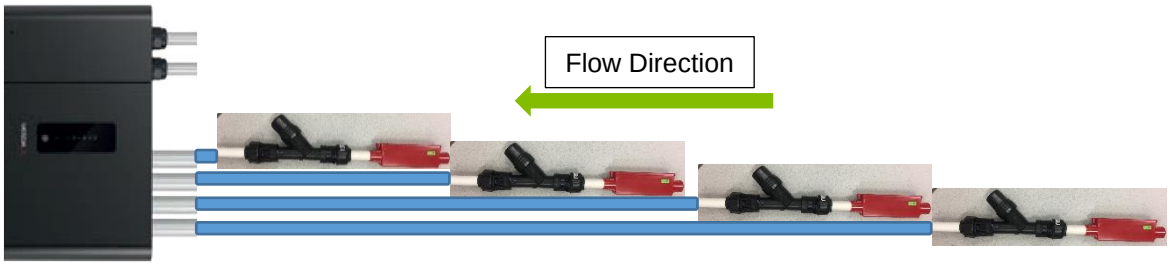

Figure 3: In-Line Mesh Strainer Installation

5 Commissioning and Maintenance

- After installation of the in-line mesh strainer or the replacement of the mesh screen, smoke tests must be conducted to verify system performance (smoke detection, smoke transport time) – refer to VESDA Commissioning Guide (No. 10195). After installation, smoke tests should be conducted for smoke detection verification.
- The in-line mesh strainer must be replaced every 1 year and the date recorded. Note that replacement of the mesh screen element is recommended as cleaning was not effective for some contaminants.
- Flow thresholds should be set to less than +/-20% to ensure proper system operation.

6 Further Support

Contact an Xtralis office or distributor for further information.

Appendix 1: Datasheet of Philmac 25mm x 1" Metric Poly x FI BSP Pipe End Connector

STANDARDS

Philmac 3G Metric™ is a complete range of mechanical fittings designed to make connections simple when joining metric PE pipes.

Philmac 3G Metric's innovative design comprises the following product mix;

Product Description	Size (mm)	Maximum Operating Pressure (KPa)
Compression fittings (PE x PE/FI BSP/MI BSP)	16-63	1600 (16 bar)
Compression fittings PE x (UTC)	16-63 (15-61)	1250 (12.5 bar)
Compression fittings PE x (Copper)	16-32 (½", ¾")	1600 (16 bar)
Tapping saddles	32-110	1600 (16 bar)
Accessories - Spanners	20-63	

Philmac 3G Metric™ is designed to comply with the requirements of the following standards:

AS/NZS4129 & 14236
Fittings for polyethylene pressure pipe systems.

AS/NZS 4020
Products for use in contact with water intended for human consumption with regards to their effect on the quality of water.

AS3688
Water supply - copper and copper alloy body compression and capillary fittings and threaded-end connectors.

ISO7.1 & BS21
Pipe threads where pressure joints are made on the threads.

PE Pipes - AS/NZS4130, ISO4427, EN12201 (formally BS6572 & BS6730)
Polyethylene pipes for pressure applications.

Copper Pipes - AS1432
Copper tubes for plumbing, gas fitting and drainage applications.

Note: Philmac 3G Metric™ is also suitable for use with pipes manufactured according to various overseas and international standards. Please consult Philmac Technical Services for information.

Appendix 2: Datasheet of RBY100MPTX

Landscape Drip
Control Zone Components

Inline RBY Filter

Static filter helps prevent plugging in a drip irrigation system

Features

- A simple and reliable filter for low-volume irrigation systems
- Simple to clean, as cap has a sealing O-ring and unthreads to provide access to the stainless steel filter element
- Strong and reliable due to its robust design and glass-filled polypropylene construction
- Male x Male threaded connections for direct connection to valves and pressure regulators
- Replacement stainless steel elements are available in 200 mesh (75 micron)

Operating Range

- Flow:
  - 3/4" units: 0.20 to 12.0 gpm (0.8 to 45.4 l/m)
  - 1" units: 0.20 to 18.0 gpm (0.8 to 68.1 l/m)
- Pressure: 20 to 150 psi (1.4 to 10.3 bar)
- Filtration: 200 mesh (75 micron)

Models

- RBY075MPTX: ¾" Inline RBY Filter with 200 Mesh Screen
- RBY100MPTX: 1" Inline RBY Filter with 200 Mesh Screen*

Replacement screen:

- RBY-200SSMX (200 mesh stainless steel screen)

Note: *Filter must be installed downstream of a control valve and not under constant pressure.*

RBY075MPTX

Pressure Loss Characteristics

Flow Rate		RBY075MPTX		RBY100MPTX	
gpm	l/m	psi	bar	psi	bar
1.00	0.8	0.1	0.00	0.1	0.00
3.00	3.8	0.4	0.01	0.3	0.01
5.0	11.4	1.1	0.03	0.5	0.02
7.0	18.9	1.6	0.08	0.8	0.03
9.0	26.5	2.7	0.11	1.4	0.06
12.0	34.1	4.5	0.19	2.2	0.10
14.0	45.4	—	0.31	3.0	0.15
16.0	53.0	—	—	3.8	0.21
18.0	60.6	—	—	4.7	0.26
	68.1	—	—	—	0.32

Note: *Pressure loss for 200 mesh filter screen*

https://www.rainbird.com/sites/default/files/media/documents/2020-09/inline-rby-filter-pressure-loss-charts.pdf

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