

# VESDA® VLI PIPE NETWORK BACK FLUSH APPLICATION NOTE

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## **Preface**

This Application Note provides guidelines on the VESDA VLI pipe network maintenance via means of back flushing. These guidelines when followed will ensure reliable system performance.

## **Related Products**

VESDA VLI detectors.

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# 1 Introduction

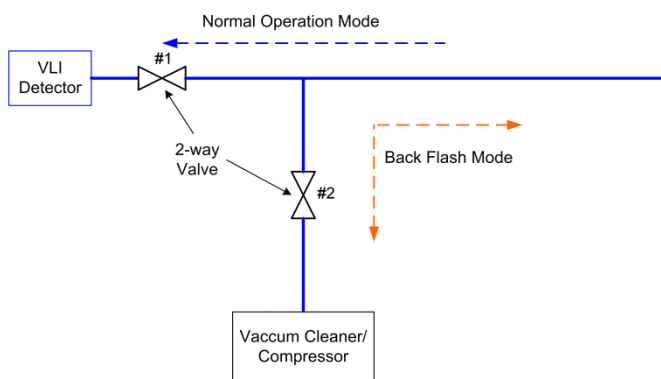
Reliable detection performance of the VESDA VLI system is ensured with proper and regular maintenance of the pipe network. Pipe network maintenance is intended to dislodge dust and contaminants from sampling holes and clean the pipe network. Such objective is met with back flushing the pipe network through the application of vacuum pressure or compressed air.

## 2 Back Flush

The back flush setup is implemented close to the VLI detector (downstream from sampling holes). Two back flush setups can be used: (i) 2 x 2-way valves (Figure 1), (ii) 1 x 3-way valve (Figure 2). With both setups, the use of ball valves is recommended.

### 2 x 2-way valves Setup

During normal sampling (Normal Operation Mode), valve #1 is open and valve #2 is closed. To back flush the pipe network (Back Flush Mode), valve #1 is closed and valve #2 is open.



(a) Setup

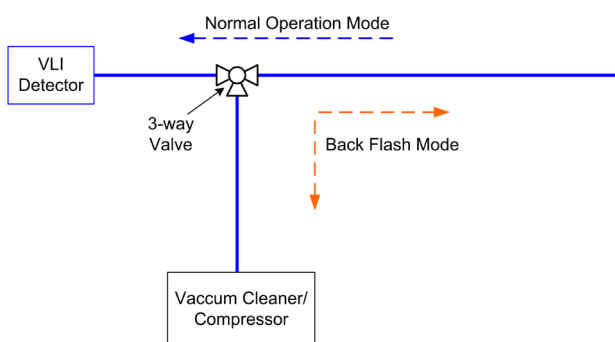


(b) 2-way valve - Example

Figure 1: Back Flush: 2 x 2-way valves Configuration

### 3-way valve Setup

The 3-way valve can be easily set to divert the flow intended for the Normal Operation and Back Flush modes.



(a) Setup



(b) 3-way valve - Example

Figure 2: Back Flush: 1 x 3-way valve Configuration



#### Note!

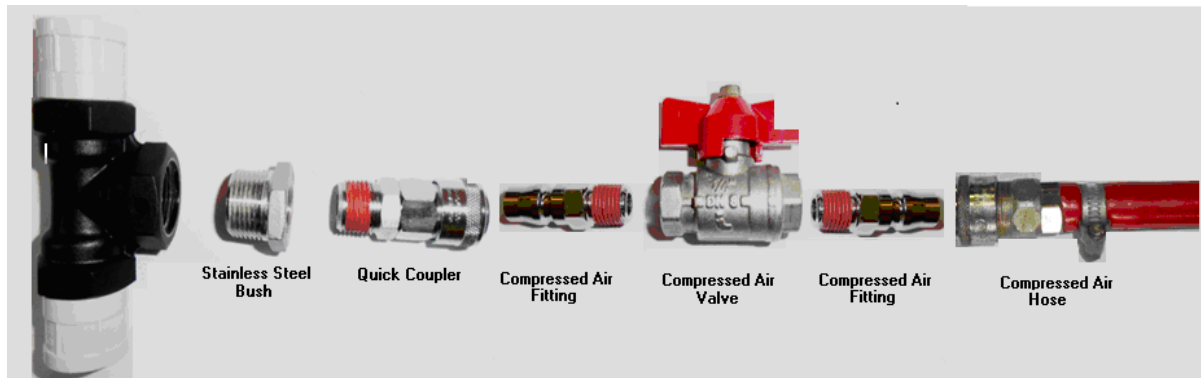
The pipe ends must be solvent glued onto the valve's end connectors.

### Normal Operation Mode

When in Normal Operation Mode, the 2-way or 3-way valves should provide an open flow path and not restrict the flow of air in the sampling pipe as this will affect the transport time of the VLI system. To ensure minimal flow restriction the internal effective diameter (not the inlet and exhaust ports) of the valve(s) must be similar to the internal diameter of the sampling pipe (a deviation less than 10% is accepted). Where this inspection is not possible then information must be obtained from the manufacturer. Where such information is not available then the valve should not be used.

### Back Flush Mode

An example of a setup for back flushing using compressed air is shown in Figure 3. The setup comprises stainless steel bushing, valve and fittings for connection to the compressed air hose which can be readily sourced from most suppliers.



*Figure 3: Compressed Air Line Component Setup*

Back flush frequency is expected to vary in accordance with the ambient background level where sampling occurs. The following steps will assist in identifying the appropriate back flush frequency for any environment.

1. Following 1 month normal operation, record the VLI detector Flow (L/min). Perform a smoke transport time test and note the time to detector response.
2. Set pipe network to Back Flush Mode.
3. Apply vacuum pressure using an industrial vacuum cleaner or compressed air using a compressor for a 4min period. Ensure both methods can deliver 300 to 500kPa pressure.
4. Set pipe network to Normal Operation Mode.
5. Record VLI detector Flow (L/min). Perform a smoke transport time test and note the time to detector response.
6. Normalise the airflow of the VLI detector.

A deviation in excess of 10% between Step 1 and 5 results will denote the appropriate interval for the back flush activity. If deviation is less than 10% repeat above steps ensuring that with each repeat the duration of the VLI system operation is increased by a one month interval. For example: 2 months for the first repeat, 3 months for the second repeat, etc.



#### **Note!**

When the valves are controlled automatically the control system and actuators should be robust and reliable. It is recommended that the de-energise state of any valve is such that, when power fails, the valve resorts to the *Normal Operation Mode*.

## **3 Further Support**

Contact an Xtralis office or distributor for further information.

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