




# VESDA | Installation

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# Agenda

## CONTENTS

- Introduction to Xtralis
- Introduction to Aspirating Smoke Detection (ASD) and Main Applications
- Product Overview (VESDA and VESDA-E)
- System Design and Practical Exercise (Concept, Layout AutoCAD, ASPIRE Software)
- **Installation Details**
- Commissioning, Testing and Maintenance

# Module Objectives

## Installation Details

**Things you will learn:**

- Pre-installation Check List
- How to verify required items and accessories (type, model, …)
- Site requirements
- Main instructions for mounting items (detector, pipes & fittings, and supporting items)

# Pre-installation

You should read the following documents prior to installation.
These are posted on www.xtralis.com as part of the System Design Manual.

- Product Data Sheet
- VESDA Pipe Network Design Guide
- VESDA Pipe Network Installation Guide
- Product Manual

These documents have more specific content than this training module, and should act as your main guide, except as superseded by local code.

# Pre-installation Check List

- Have you read related product manuals, and the pipe installation guide?
- Do you have pipe layout drawings & calculations from the main contractor, end user, designer, or a qualified distributor's engineer, *which will tell you pipe and hole spacing?*
- Have you prepared pipe and pipe fittings according to Xtralis (VESDA's) recommendations?
- Do you have all tools and permissions at hand?



# Pipes and Fittings

**CPVC**


- Pipe is typically installed in a plastic material for ease of handling and Xtralis offer a range of CPVC pipe. In some circumstances (environmental or where LSF is required) alternative pipe may be specified and could be copper, steel or stainless-steel”
- Check with local distributer for availability and packages

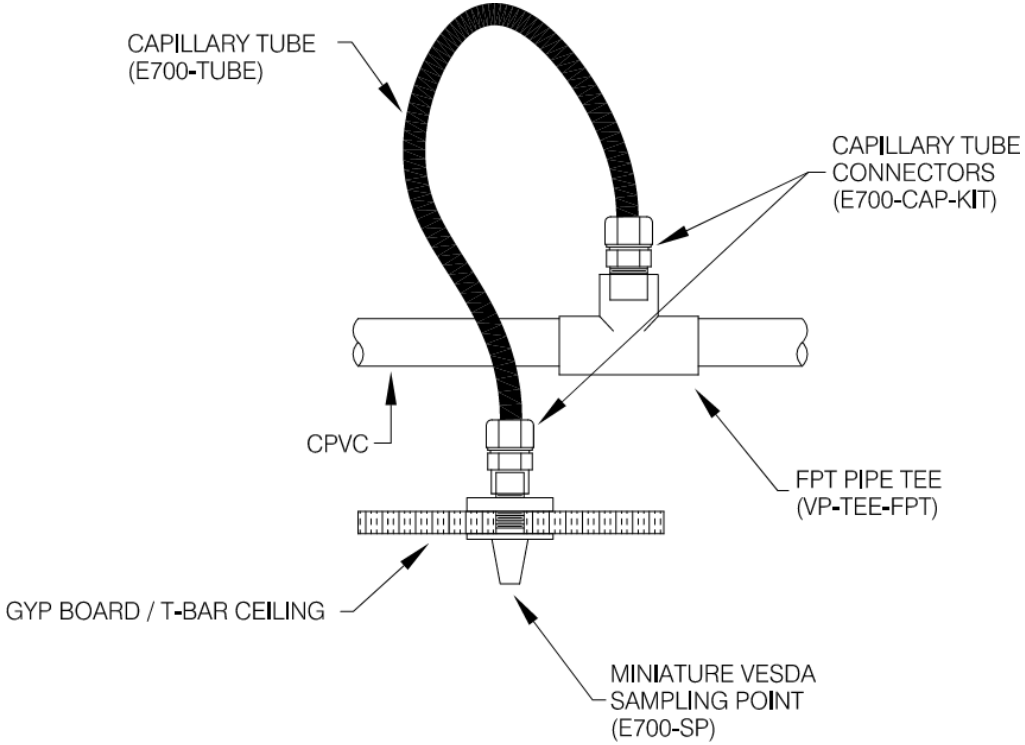
# Bends

- 90° bends are available, based on pipes & fittings approval.

- 45° bends.

# Tees

Tees, are used for branching a sampling pipe or attaching capillaries and drop pipes.




CAPILLARY SAMPLING POINT DETAIL

SCALE: NTS

**Capillary kit consists of threaded T, Sample Point and compression fittings**

# Capillary Sampling

Where to use Capillary Sampling?

- **Below false ceiling**
- **In-cabinet detection**
- Where there is a requirement for aesthetics, security, or unobtrusive protection


**Capillaries come as separated fittings in UL**

- **Ordering capillaries differ from region to another (Size, Type, Material, …) check with local distributer.**
- **Any nylon compression fittings are not plenum rated.**



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# Coupling & Socket Unions

Couplings & socket unions are used to connect pipes together.

Coupling Joint

Socket Unions

# Clips

Several types of pipe clips are locally available.

Clip or support the VESDA piping every 5 feet with any UL approved clip or support

# Clean Out Tee Kit (VSP-COT-KIT)

Clean Out Tee Kit installed at each detector inlet allows for convenient access to the pipe network. When properly installed, clean out tee kit provides a simple to use, accessible location to perform regular pipe cleaning.

The Xtralis Clean Out Tee Kit has been designed to simplify cleaning and enhance suitability providing robust, normally open flow operation. With a ball valve open/close feature and an accompanying tee port with brass plug the clean out tee kit provides technicians a method to close the flow of air to the detector with the ball valve and attach a shop vacuum or compressed air tool into the tee allowing instantaneous cleaning of the pipe network. Be aware of the environment when choosing to blow out or suck out the pipe network for cleaning. We do not recommend blowing out pipes if contaminates may be present in the pipe and allow for distribution through the pipe network and could be harmful humans.

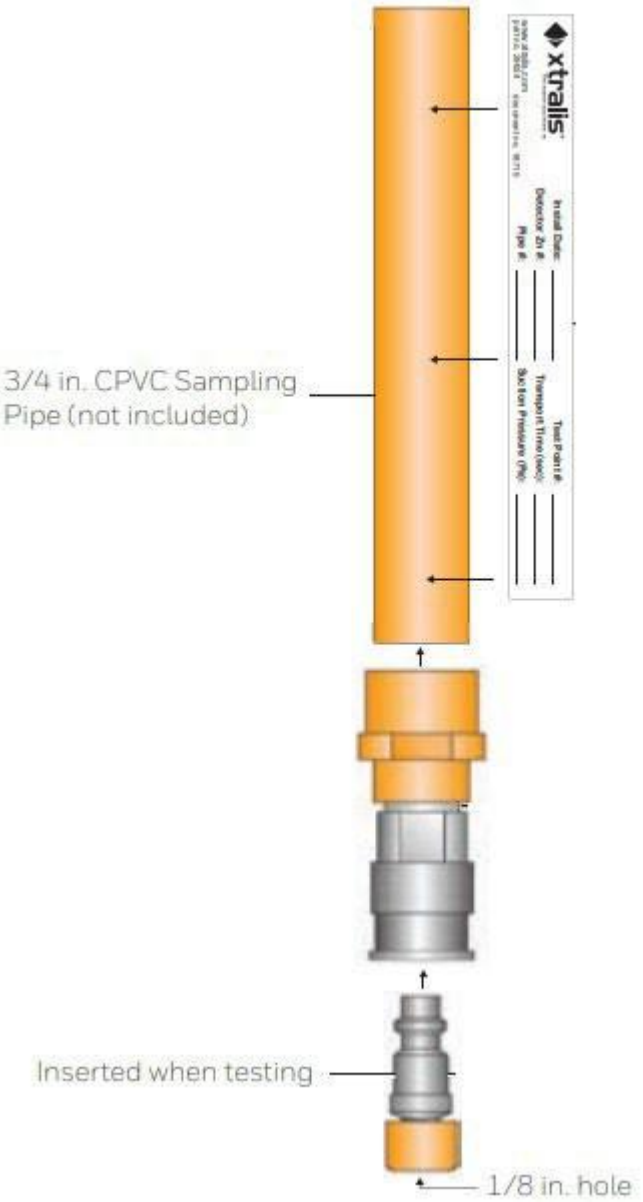
# Benchmark Test Points (VSP-TP-KIT-US)

Testing from a point along each pipe run furthest from the ASD detector provides a means to validate system and pipe network integrity. When properly designed and installed, test points are positioned at an accessible height and location and provided with a means to open temporarily when testing.

It comes in CPVC:

- Benchmark Test Point kit which includes (Test Point Labels, CPVC Socket x ½ in MNPT Adapter fitted with Brass Quick Connect & Coupler Plug)

****Test points are required at the end of every pipe**



# VEA Tubes and Sample Points*

| | |
|---|---|
|  | VESDA-E VEA 6mm Microbore Tube UL-compliant Plenum-rated |
|  | VESDA-E VEA 4mm Microbore Tube UL-compliant Plenum-rated |
|  | VESDA-E VEA 4/ 6mm Standard Sampling Point (White/ Black) |
|  | VESDA-E VEA 4/ 6mm Surface Mount Sampling Point (White/ Black) |

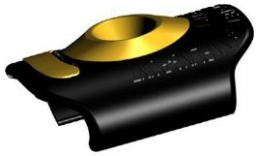
**Tube Fittings**

| | | | |
|---|---|---|---|
|  |  |  |  |
| Reducer | Straight Union | Right Angle Joiner | Blanking Plug |

* For all accessories, refer to Xtralis Safety Solutions Product Catalogue (Doc# 27787)

# Sample hole Clips

- Sample hole clip for standard and harsh environments
- Colour code (acc. to resistor code) for clear hole size identification
- Ready to install, no on-site assembly
- Reduces dust and dirt assembly, airflow faults as well as maintenance and troubleshooting cost
- Holes diameter from 2millimetres to 6.5 millimetres



## Standard Environment Clip


## Harsh Environment Clip

# Use Pipe Cutter


- **Use pipe cutting shears or wheel type plastic tube cutter**. It is important that the cutting edge of the shears and cutter are sharp.
- Don’t use a saw

- Remember to remove all dust and shavings created when cutting the pipe
- **Vacuum piping before connecting to VESDA detector**



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# Water Trap

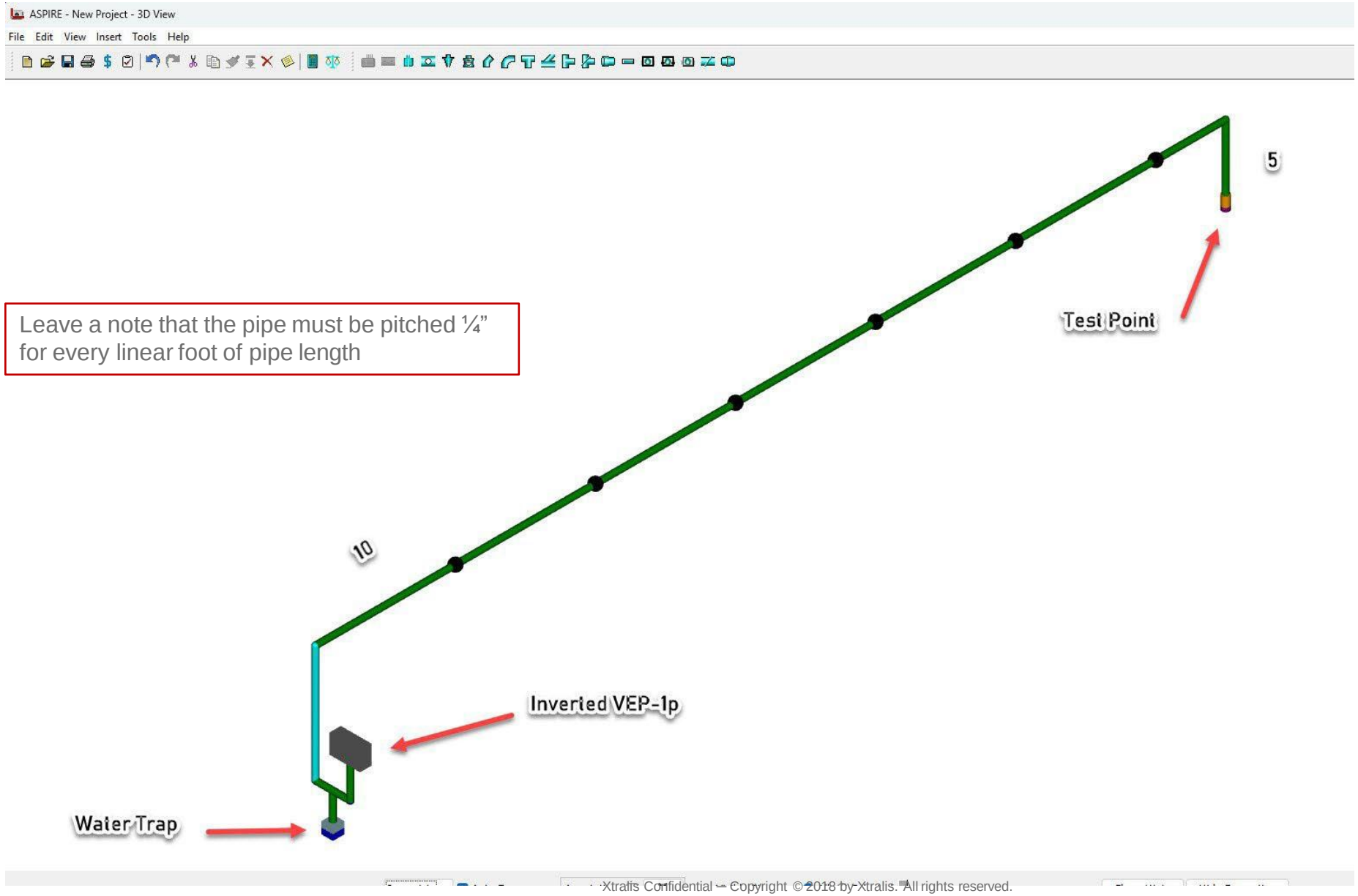
Water traps are necessary under vastly varying environmental conditions where internal sampling pipe condensation is a possibility.

To install a water trap, a Tee section of pipe must be fitted to the pipe entering the inverted detector. Water will pool at the stop valve on the downwards pointing arm of the Tee.

Water will condensate when the warmer sampled air (humid) comes into contact with cooler pipes an that water traps are best positioned at the colder spots, before detector entry (inverted). The water trap is intended to catch sampling pipe condensation and prevent water from reaching the detector.

Note: Water trap stop valves and end caps MUST be closed as soon as the water has been drained. Leaving the pipe open will affect the airflow.

# Water Trap, Test Point, Inverted VEP, and note



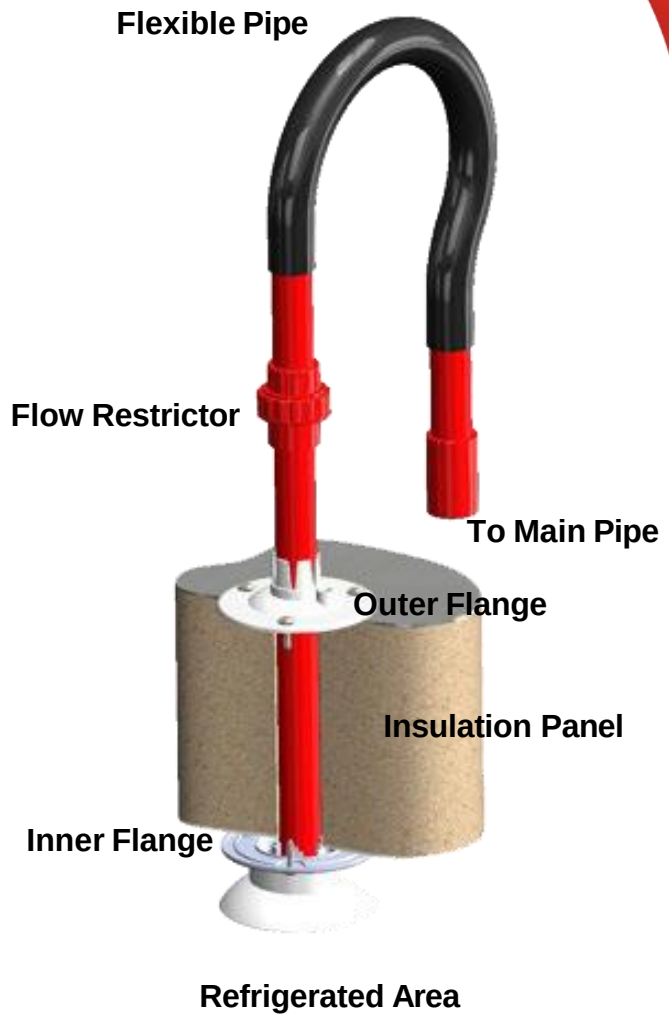

Leave a note that the pipe must be pitched ¼” for every linear foot of pipe length

# Refrigerated Storage Sampling Kit (VSP-860-US)

- Refrigerated Storage Sampling Kit is an innovative sampling arrangement recommended for refrigerated storage facilities, with or without ceiling cavities, experiencing frequent ice build up issues.

- The sampling kit branches off the main pipe and with its unique design the sampling hole is transposed to an upstream location while maintaining an open ended pipe inside the refrigerated area.

- Suitable for temperatures down to -40°C (-40°F) and comprises two sets of parts:
  - Above refrigerated storage ceiling
  - Below refrigerated storage ceiling



# VESDA Sensepoint XCL

- Gas detector that connects to the Xtralis VESDA pipe network to deliver a combined smoke detection and environmental monitoring solution.

- VESDA Senspoint XCL has two types:

1) **VESDA Sensepoint XCL – Large Bore gas detector is a gas detection solution that utilizes the ASD pipe network to deliver superior gas** detection via remote and multi-hole (multi-point) sampling.

2) **VESDA Sensepoint XCL – Micro Bore gas detector is a gas detection solution that utilizes VESDA-E VEA tube networks** for remote gas detection.

# 4 Sensor Life

The life of gas sensors is related to the sensing technology and environmental conditions.

The life of the flammable gas sensor that use catalytic beads is directly related to the amount of catalytic poisons they are exposed to including silicon or sulphur-based compounds e.g. silicon-based furniture polish, electrical contact releasing sprays, lubricants, etc.

*Table 1: Gas Type – Detection Principle – Typical Sensor Life*

| Gas Type | Detection Principle | Typical Sensor Life |
|---|---|---|
| Carbon Monoxide | Electrochemical | 2 years |
| Flammable | Catalytic (CAT) | 2 years |
| Hydrogen | Electrochemical | 2 years |
| Carbon Dioxide | Infrared | 5 years |
| Carbon Dioxide | Infrared | 5 years |
| Hydrogen Sulphide | Electrochemical | 2.5 years |
| Nitrogen Dioxide | Electrochemical | 2 years |
| Ammonia | Electrochemical | 2 years |
| Oxygen | Electrochemical | 2 years |

The storage life of Electrochemical gas sensors are 6 months, IR and CAT gas sensors are 12 months. Gas sensor once purchased should be installed within the "Install By" date printed on the gas detector label.

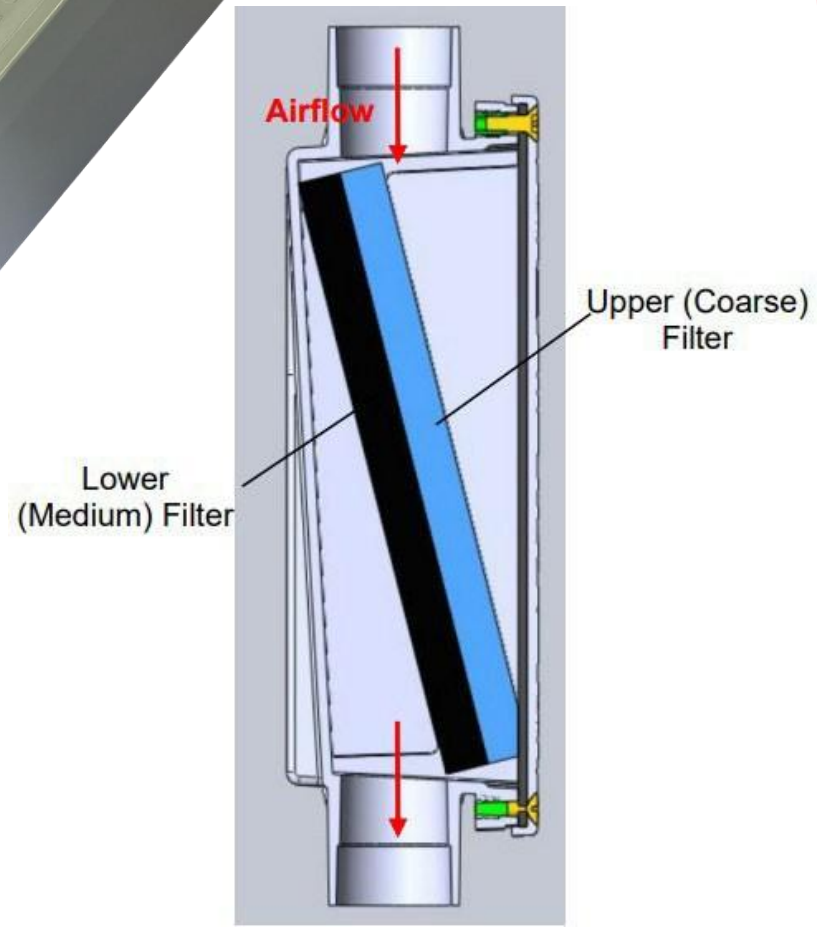
# Inline Filter (VSP-850)

In-Line Filter provides the ability to address a wide range of environments with high levels of airborne contaminants in a simple and cost-effective manner.

In-Line Filter can be fitted in line with the sampling pipe without the need for any additional pipe fittings hence reducing the cost of installation.

In-Line Filter consists of two carefully selected foam elements placed at an angle inside the housing. The upper filter is a course medium while the lower is a finer medium.

In-Line Filter can be installed in the vertical or horizontal orientation at an accessible location (normally close to the detector) for ease of maintenance. Ensure at least a 0.5m (1.64 ft) straight pipe section to the detector inlet manifold.

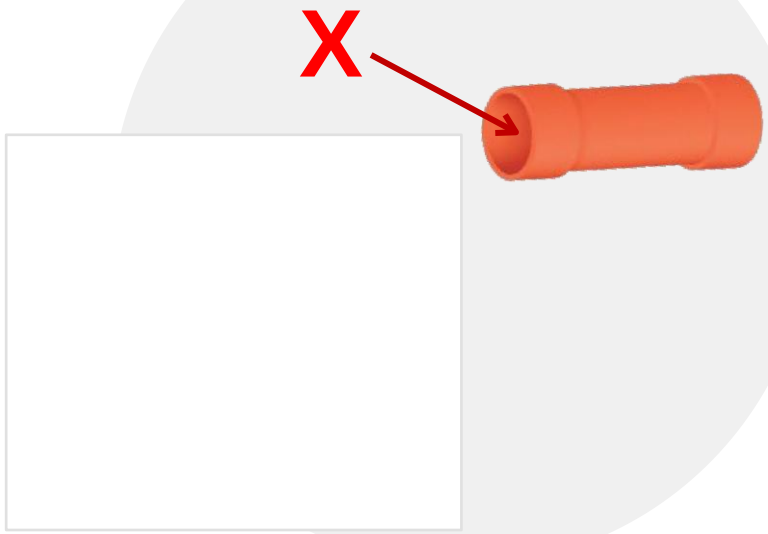
# Straight Pipe at Detector Entry

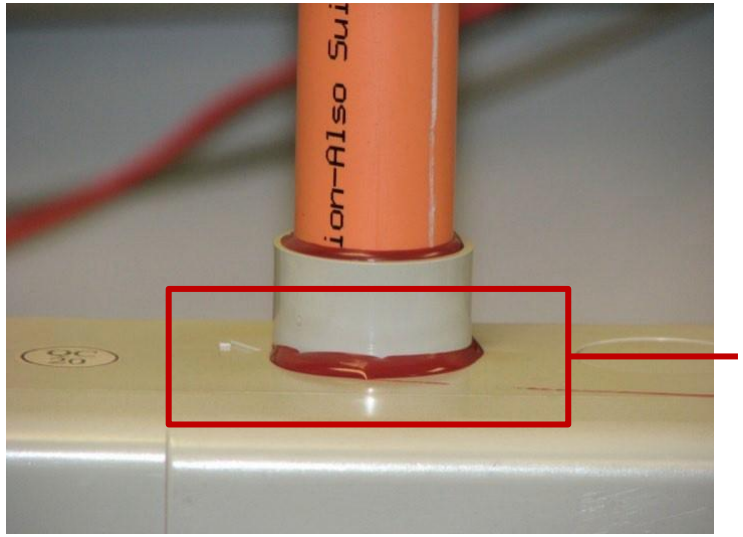

This short entry piping will NOT allow for accurate flow monitoring.

- There is a **minimum of 20”.** (500mm) of straight pipe recommended before the pipe enters the detector. This is due to flow monitoring and allows airflow to become stable before entering the flow sensor.

# Be Careful with Glue

- All joints (except the joint to the detector) should be bonded using appropriate solvent cement
- **Don’t apply solvent cement on the pipe inlets**
- Apply solvent cement on the pipe not on the fittings
- Thread the end caps if possible



Don’t apply solvent cement at the pipe entry


We recommend Spears 1-Step Cement

# Pipe Work/Tips

- **Apply glue on the outside of the pipe** before joining
- **UL Listed Fastener spaced every 1.5m (5ft.)**
- Ensure appropriate fixings are used
- Minimize bends where possible
- Follow the rules in Pipe Network Design Guide
- **Never glue pipes into the detector manifold**
- Keep the pipe work neat and tidy
- Buy a separate set of drill bits only for VESDA sample holes
  - They will remain sharp

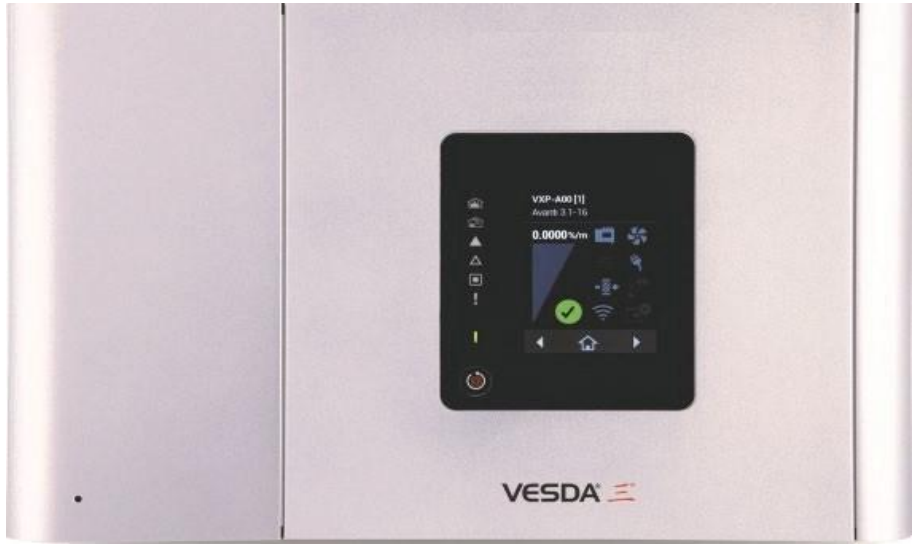
# Hole Label

- All sampling holes are required to have labels

# Detector Location

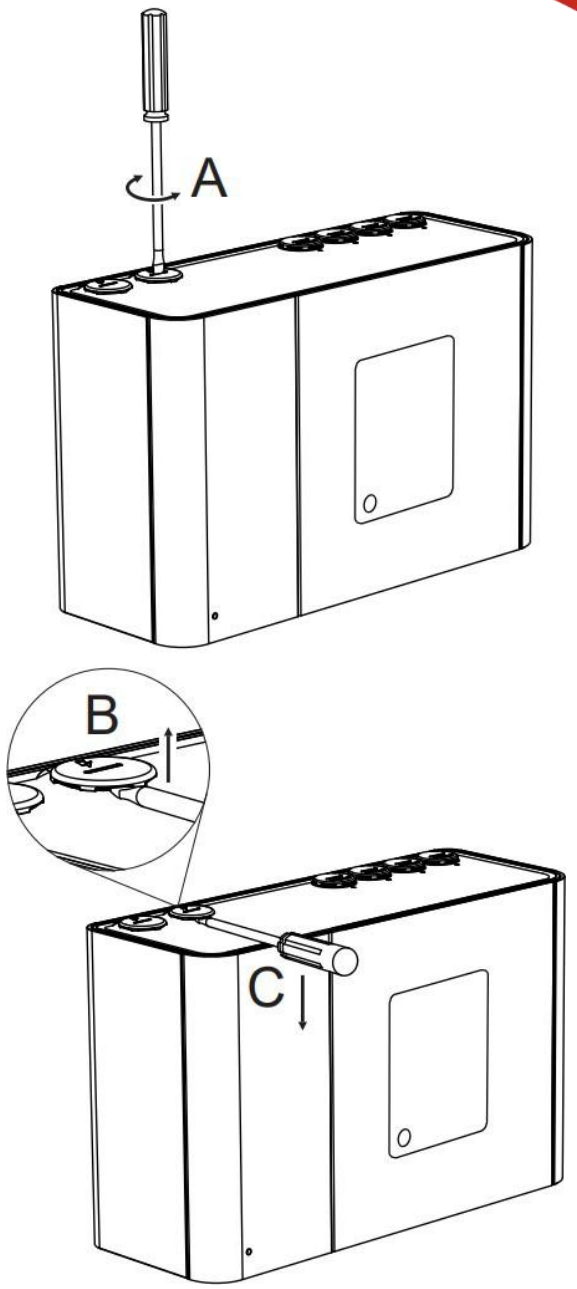
**The detector should be installed at a location where:**

- **It is accessible, normally the height is 4-5ft (1.6m) to the floor or catwalk. The purpose of this is for future maintenance**
- **It is safe**
- **It is out of corrosive or hazards area**
- **The environmental temperature is normal**



# Prepare the Detector

- Remove tape from the exhaust port.
- Invert the fascia if required. (follow invert steps in product guides)
- Remove cable and pipe inlet plugs as required. Place a large screwdriver in the large slot and twist (A), or use a small screwdriver in the side slots (B) to lever the plug out.
- Use the edge of the detector (C) for a lever point to avoid marking the case.

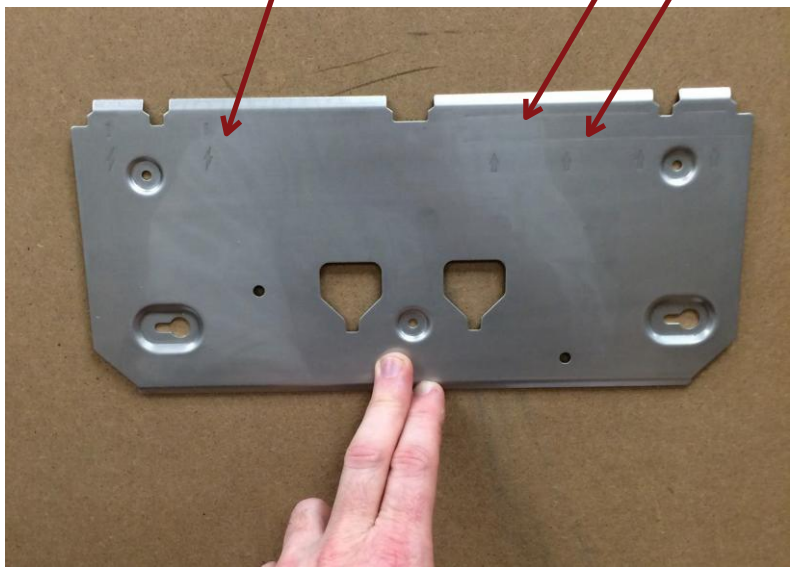


# Mounting the Detectors

Electrical Conduit alignment marks

Top ¾ inch pipe depth line

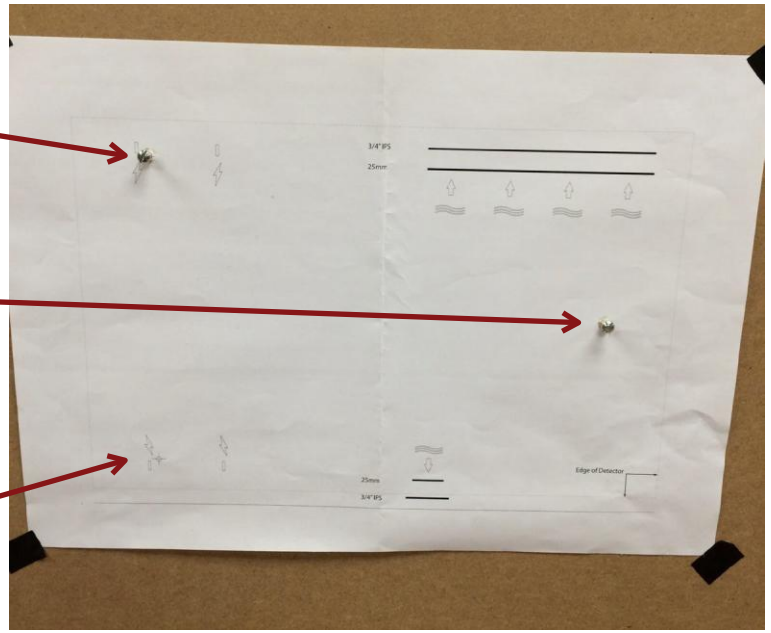
Bottom 25 millimeters pipe depth line



Position A

Position B

Position C



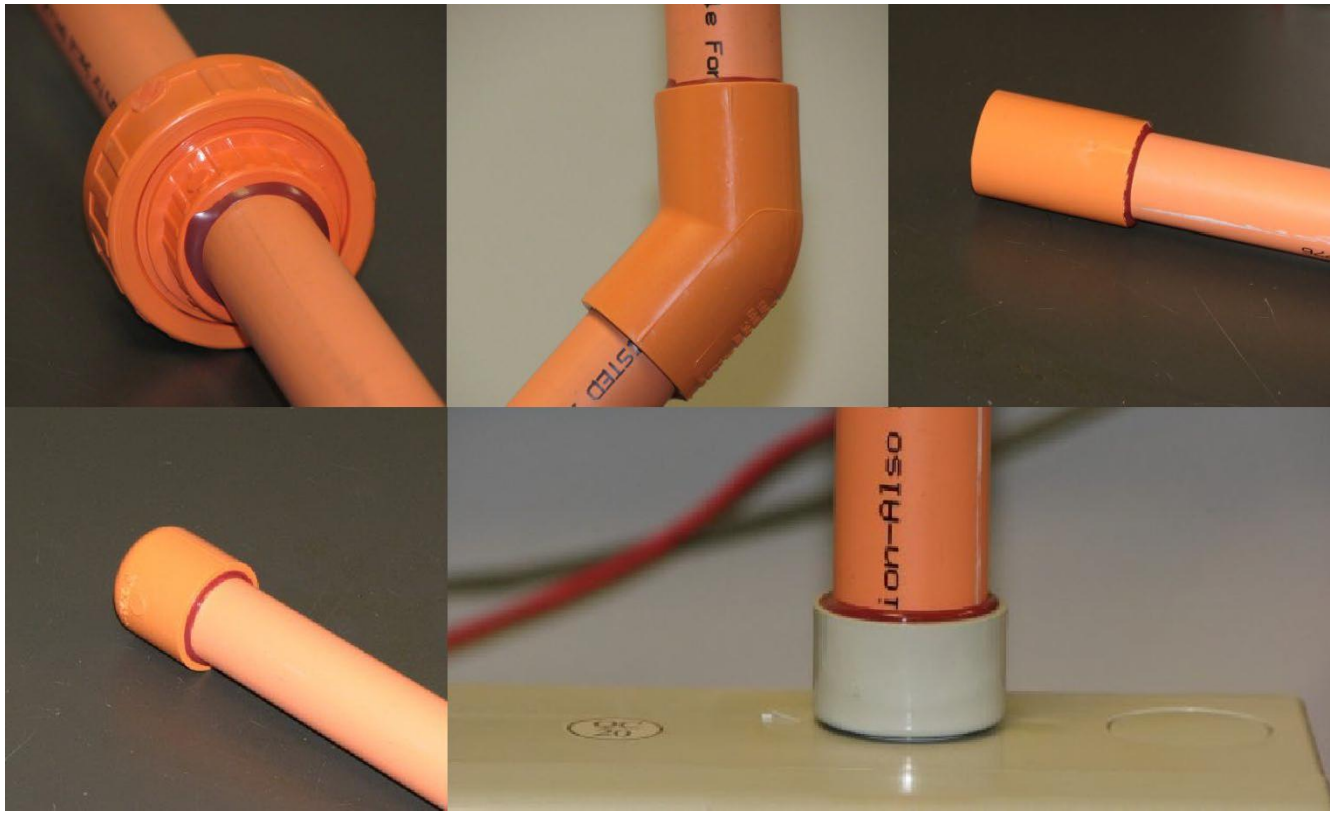
# Good Installation Examples

- Detector and pipe labels,
  all pipework straight and neat


# Good Installation Examples

- Detectors mounted neat, evenly spaced, and in line with all units labeled clearly

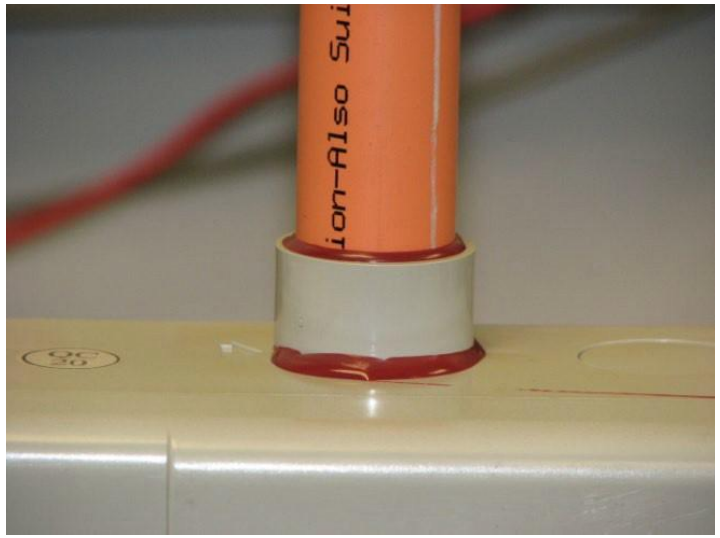
# Examples of Properly Glued Pipe (Do's)

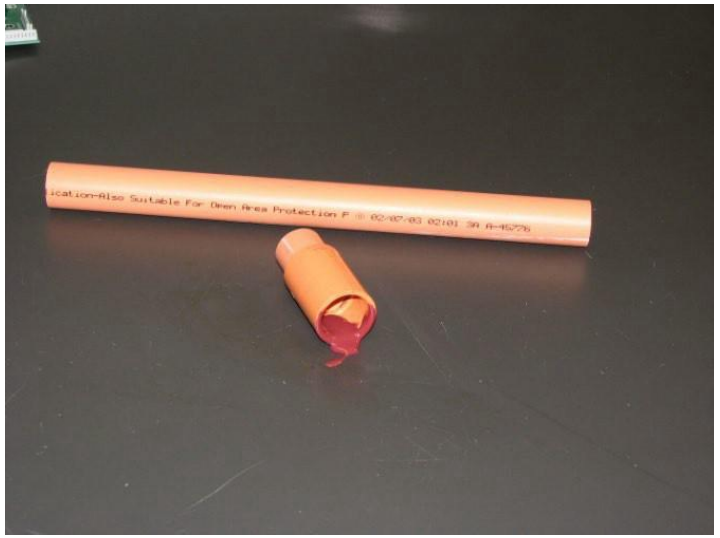


- These joints have proper cement applied with a solid, visible bead

# Example of Poorly Glued Pipes (Don’ts)

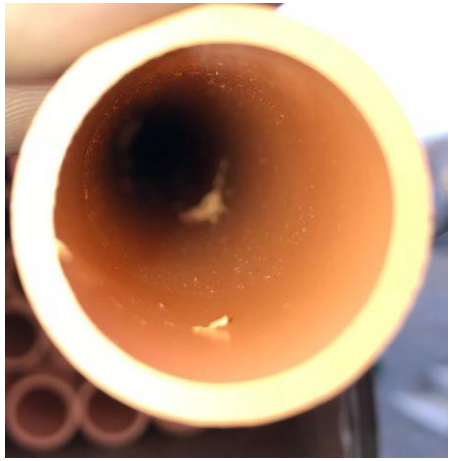
- Never cement the adaptor (grey) into the manifold
- Never cement the outer thread of a union
- Never apply cement to the inner surface of the joint





# The pipes must be cleaned. Introduce clean dry compressed air 40 PSI for 2 minutes at the detector end of each pipe, blow towards an open end.

* clean the pipe before installing the End Cap



# Installation Problems


# Installation Do’s

**In order to get a quality installation, you have to do the following:**

- Read product manual and pipe installation guide
- Get drawings from related department, such as designer, main contract, which will tell pipe spacing and hole spacing
- Understand which sampling method will be used in your project
- Prepare right pipes and fittings
- Install detectors at an accessible location
- Leave minimum 500 millimetres (20”) straight pipe before entering detector
- Install pipe support clips on average of 1.5m (5ft) maximum
- Use glue to bond all pipes except joint to the detector or perhaps threaded EC
- Label all sampling holes

# Don’ts

**In order to get a quality installation, you should also consider:**

- If you don’t have drawings and don’t know pipe spacing, hole spacing, please don’t start to install
- If you don’t have installation Data Pack, please don’t drill holes
- Don’t use glue at pipe entry
- Don’t use a saw to cut pipes
- Don’t install a detector at an inaccessible location
- **Don’t make field changes without re-checking ASPIRE**

# Summary

## Installation Details

- Distinguish between different items (capillary, elbows, pipe clips, …)
- Preparing the detector
- Preparing site for commissioning