

A photograph showing a worker on a scissor lift inside a tunnel. The worker is wearing a yellow safety vest and a hard hat. The lift is white and yellow, with the number '268' visible on its side. The tunnel walls are made of concrete blocks. A large, dark, flexible overhead protection system is installed above the lift. The text 'Overhead Protection System (OPS)' is overlaid in the center of the image.

# Overhead Protection System (OPS)

# OPS (Overhead Protection System)

## Description

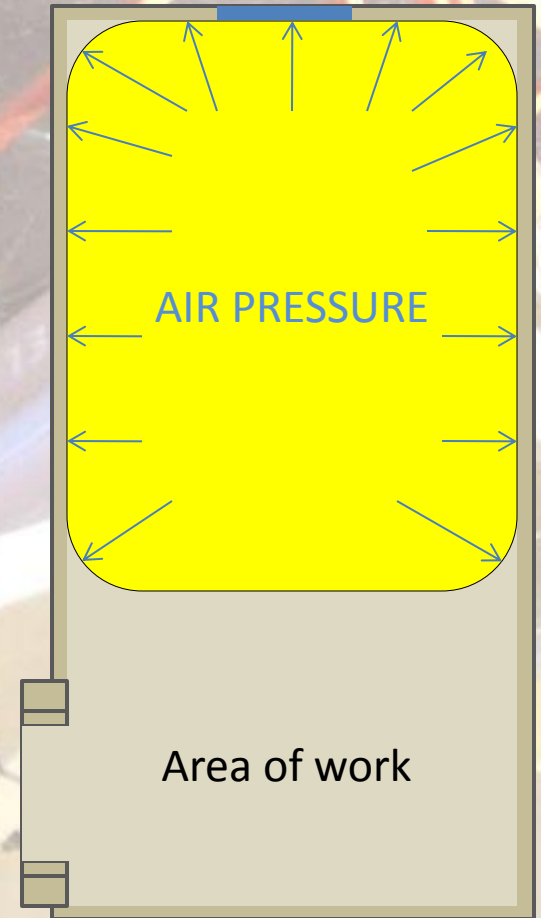
- An OPS is a re-usable, inflatable safety device that can be lowered or raised into a vessel to provide a safe work environment for personnel entering the vessel/void from falling objects, refractory or debris.



# OPS

(Overhead Protections System)

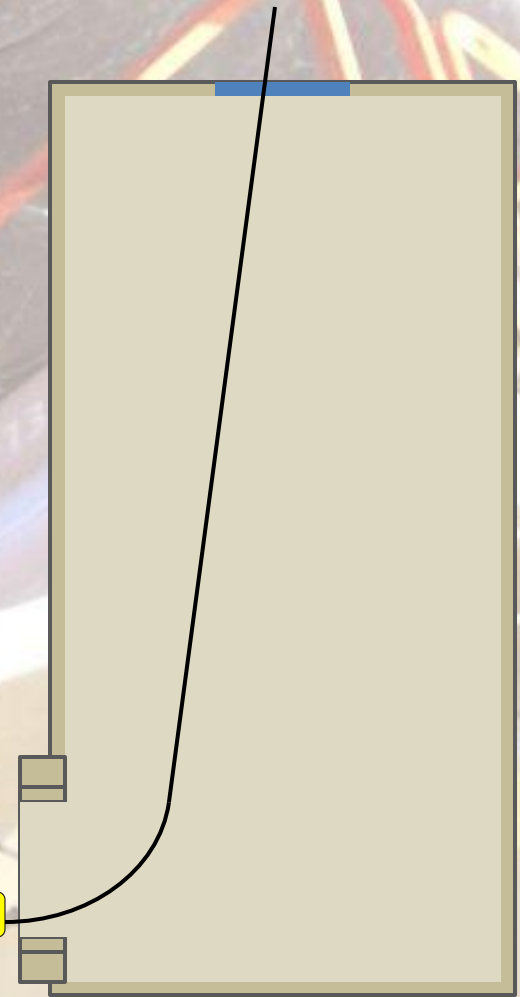
- An OPS works by applying positive pressure onto all the surfaces it comes into contact with, preventing any free fall of material, eliminating the risk.
- Nets and scaffolding are fall arrest, OPS is fall prevention.



# Installation

*(example only)*

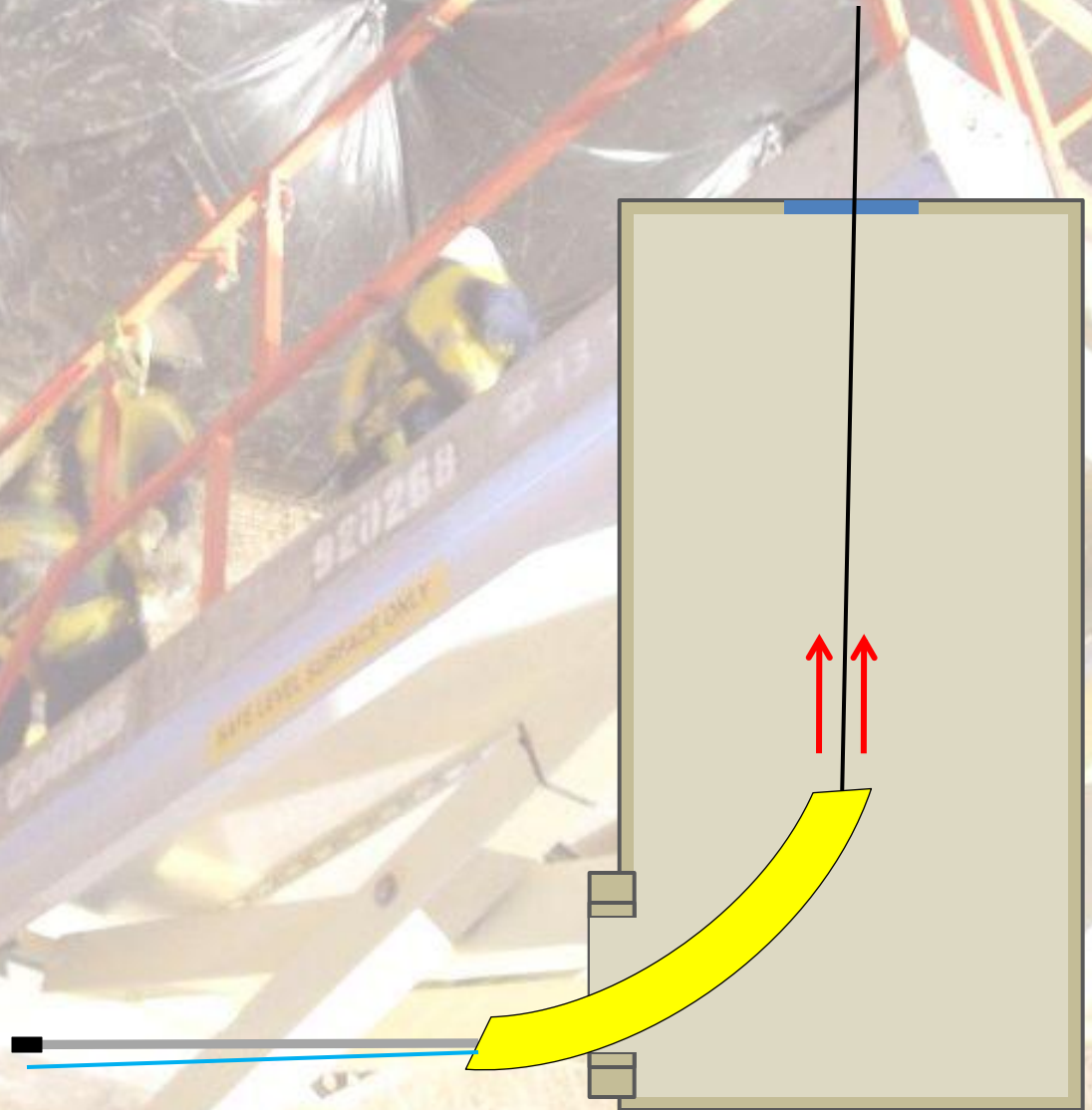
- Installation of an OPS is fast, easy and safe with zero exposure, as no personnel are required to enter the vessel. A lifting rope/cable is lowered down through an opening at the and connected to the OPS outside the vessel.



# Installation

*(example only)*

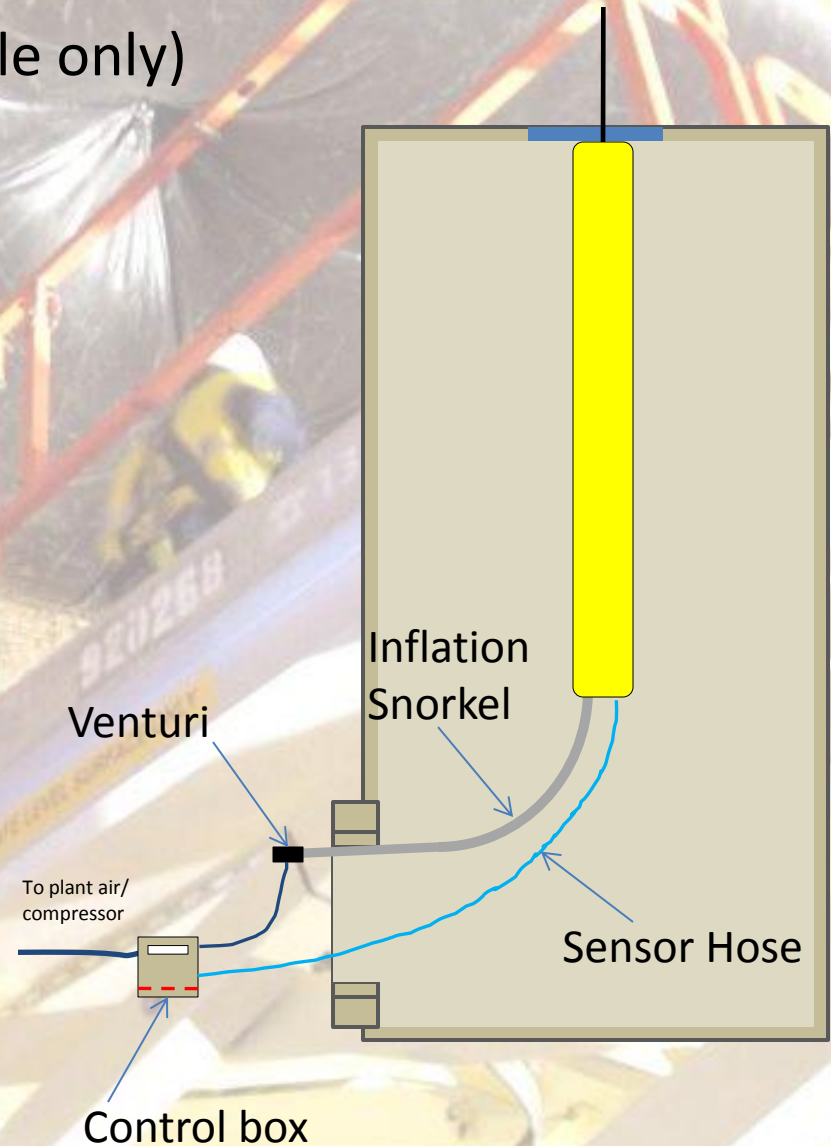
- As the OPS is lifted into position the inflation hose/snorkel and sensor hose are connected to the OPS.



# Installation

(example only)

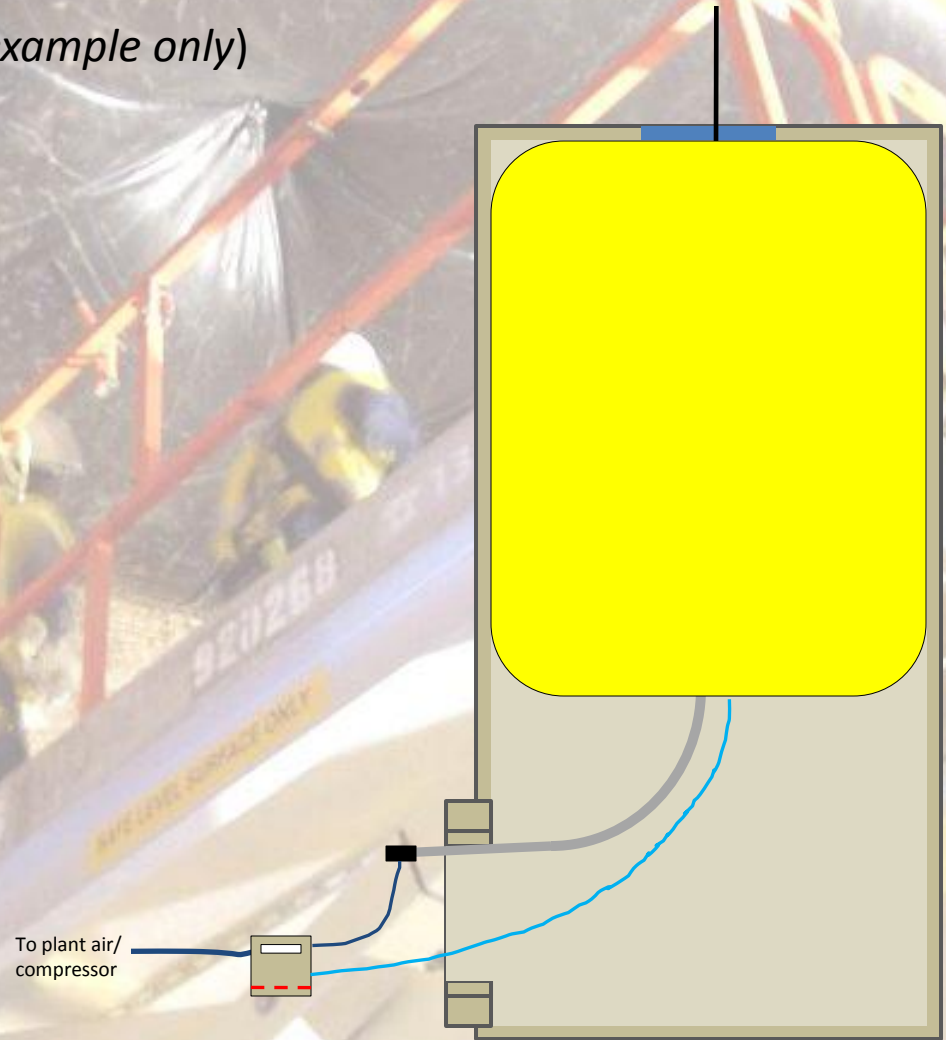
- The inflation and monitoring infrastructure is connected to the OPS prior to the system being pulled up into the vessel
- Venturi and sensor hose are connected to the air system control box, this controls and monitors air flow and OPS internal pressures.



# Installation

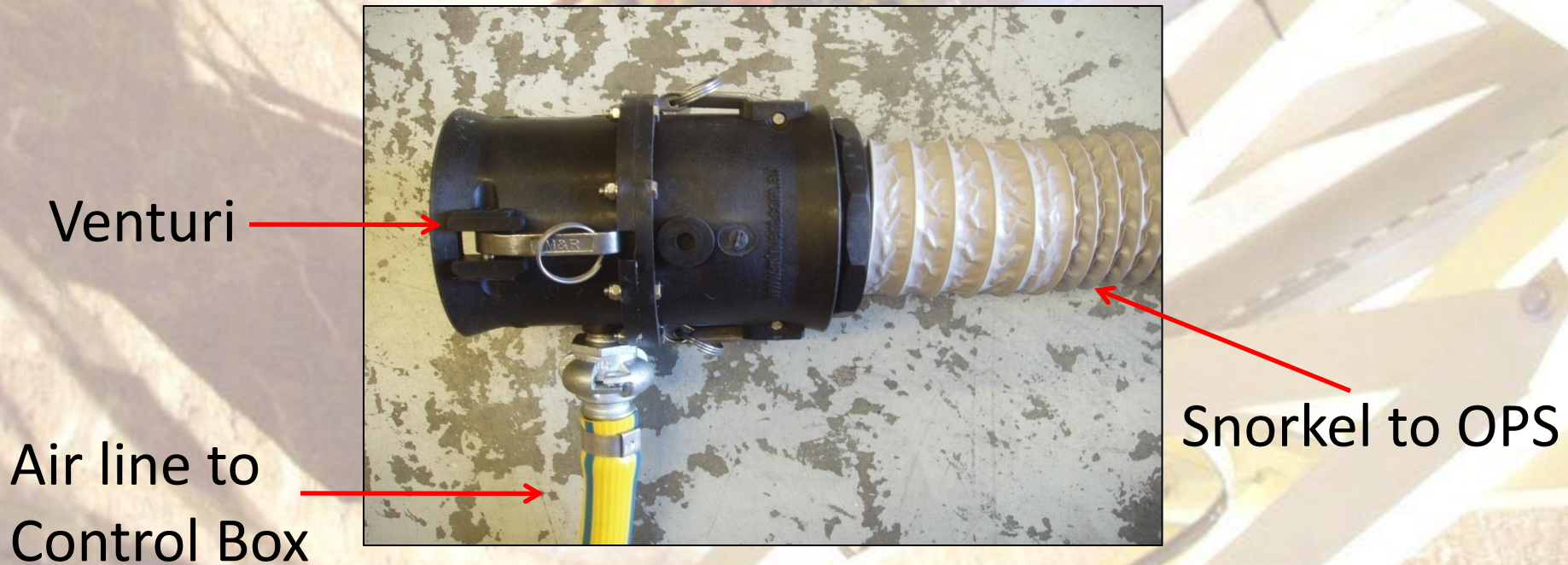
*(example only)*

- When the OPS is inflated it will self support.
- All the system are checked to be operating correctly and the “all clear” is given.
- OPS is installed and commissioned in approx 1 hour.



# Venturi

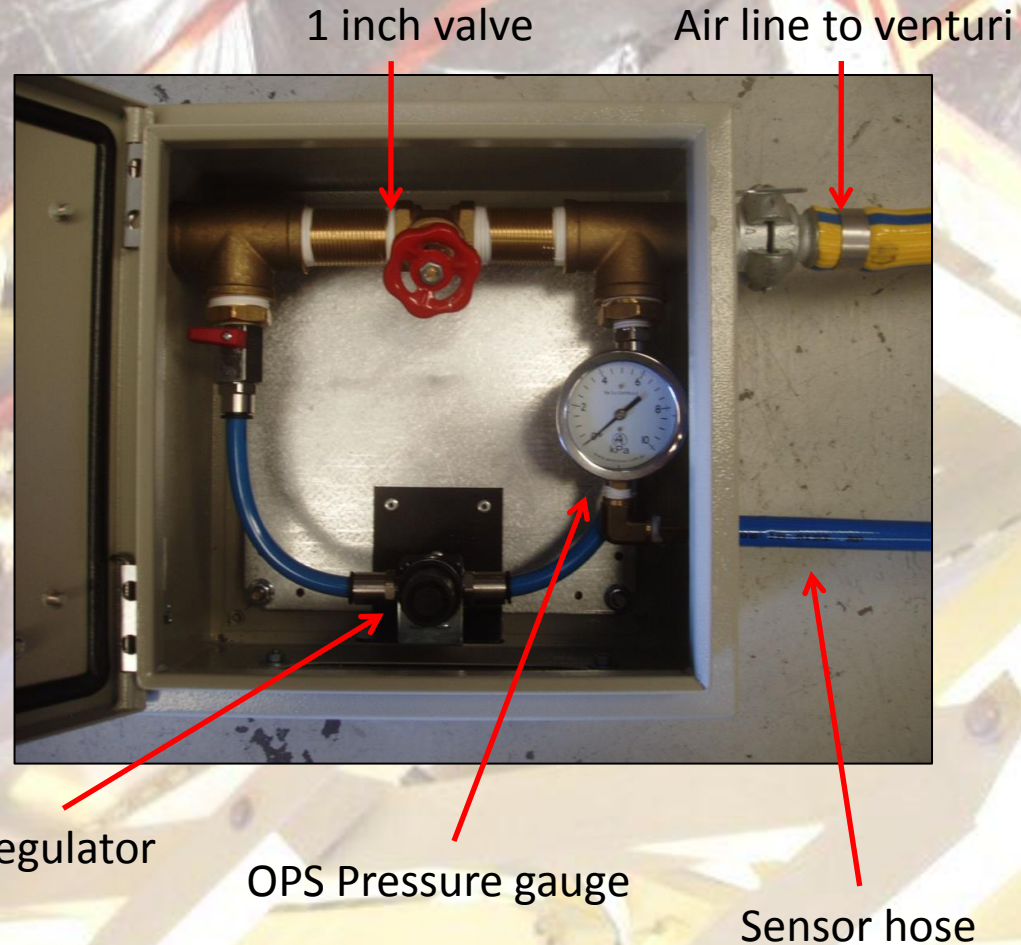
- The OPS is normally inflated by a venturi.
- A venturi converts high pressure/low volume into low pressure/high volume.
- The compressed air supplied to the venturi is regulated by the control box
- When the operating pressure inside the OPS (normally 1.5kpa )is reached, the venturi can be capped and the OPS fed via a trickle feed regulator in the control box
- Alternatively the OPS can operate with the venturi uncapped and regulated by the tap in the control box





# Control Box

- The control box regulates the flow to the venturi via the 1 inch tap or the trickle flow bypass regulator.
- The control box also houses the gauge that measures the actual pressure inside of the OPS.



# Alarm System

- Alternative to using the gauge in the control box to monitor the internal pressure of the OPS the comprehensive Audio/ visual alarm system is available.
- The sensor hose is plugged into the alarm system, which activates and signals if there is any change in the operating pressure of the OPS. The alarm senses over/under pressure, power failure and top loading. There is also battery backup.
- Operating pressure of an OPS is job specific.
- If the pressure falls below or rises above the set limits the alarm will activate with a siren and flashing light.
- The alarm system is generally placed where the confined space sentry is located, if the alarm activates the personnel can be evacuated before pressure is lost to the OPS
- Normally the airflow to the venturi can be adjusted, the system checked and the “all clear” given
- A remote audio/visual box can be plugged into the main alarm system and taken into the confined space.



# Removal

- The removal of the OPS is as easy as the installation.
- The venturi is unplugged from the snorkel and reversed, this will suck the air out of the OPS.
- When the air is sucked out, the OPS is lowered and pulled out the access point where it was installed.

# OPS Rating

*(example only)*

- The load rating for an OPS is calculated by multiplying the contact surface area ( $m^2$ ) by the force exerted by the internal air pressure, PVC has a co-efficient that needs to be factored in when calculating the load rating.
- Coefficient of static friction for the PVC is 0.9
- (e.g.) The calculated force at 1.5Kpa internal OPS air pressure is  $150Kg/m^2$ .

## Example

- Vessel: 4.0m diameter x 4.0m high, total sidewall contact only
- $0.9(50.272m^2 \times 150) = 6786.72kg$  or 6.7 ton.

# **Overhead Protection System (OPS)**

**Contact Details:**

**Minivent Solutions**

**[www.minivent.com.au](http://www.minivent.com.au)**

**[sales@minivent.com.au](mailto:sales@minivent.com.au)**

**PH: +61 8 93771129**

**FX: +61 8 93771164**



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