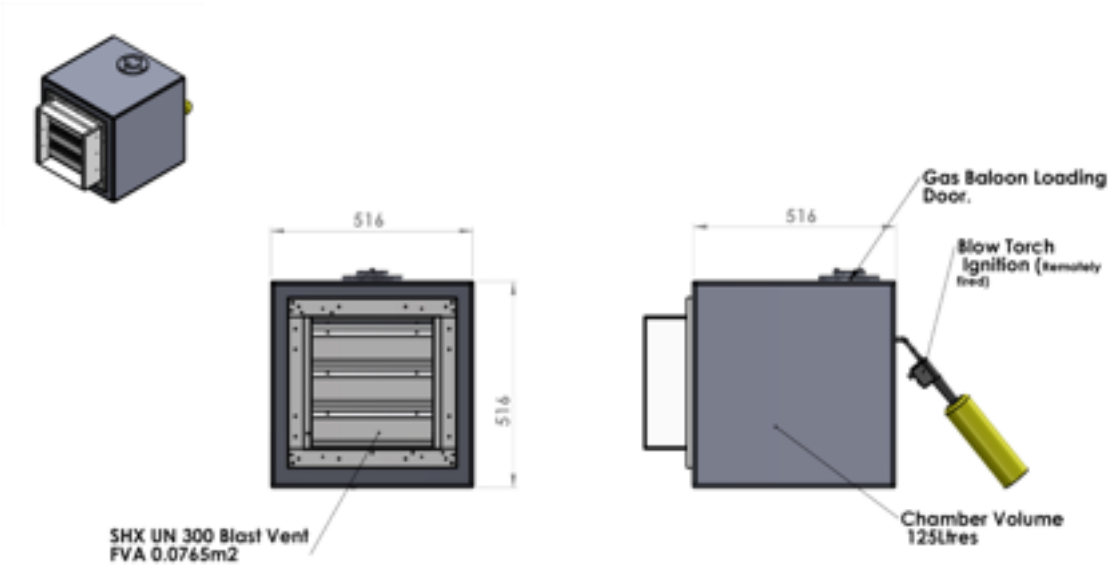
SHX-UN Explosion Blast Test Report

Report on a series of blast test to determine the operation and maximum working pressures of AFP Air Tech Ltd SHX-UN vent design.

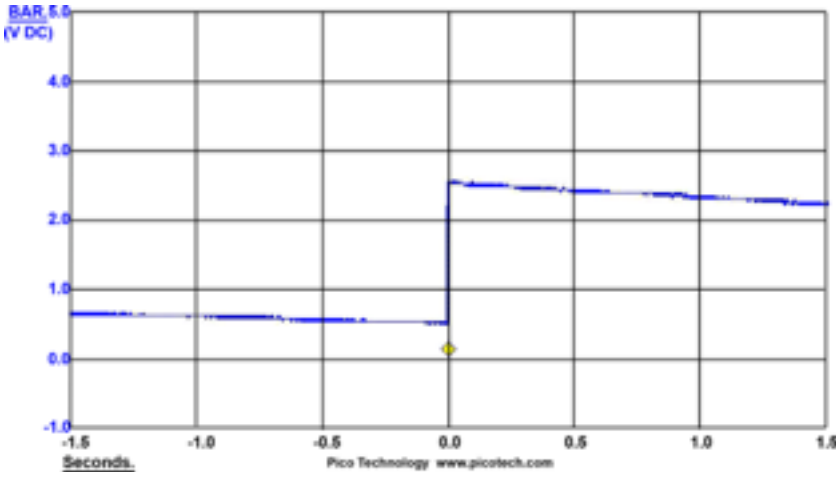
These tests were carried out over 2014 on the SHX-UN300 Pressure Vent.

1. Test Chamber.



2. Test Chamber Construction.A steel chamber was used made of 8mm steel plate with a volume of 125Litres. An SHX UN 300 was fixed to the open face. Gas was provided by filling a balloon with a gas air/gas oxygen mix and suspending it in front of a blow torch. The blow torch was ignited via a pull chord and trigger mechanism (not drawn).
3. Gas mix, Propane.Concentration aim between 3 to 5% propane with air. This required a balloon sphere with a radius between 9.64 and 11.43cm of propane. Intended to mix with the air in the test chamber before ignition.
4. Acetylene/OxygenSuggested ratio 2 Oxygen to 1 Acetylene. Balloon radius of 10cm used with volume of approximately 3 litres mix. (not intended to mix with the air in the test chamber. Ignited directly via balloon)
5. Measuring Instruments.We used a High resolution ICP pressure sensor model 112A22 from PCB Europe coupled with aPICO 2204A Oscilloscope for the pressure readings.

6. Test Results



Peak pressures achieved ranged from 1.4 to 2.6 BAR with the vent blades free to open. This is for Propane only. Acetylene and oxygen mix max pressures to be added at a later date.Maximum pressure calculated for propane air mix with no venting would be 6.8 BAR.

7. Acetylene/Oxygen Tests

Using an Acetylene/Oxygen ignition mix we used a high speed camera running at 1000 FPS to measure the speed at which the SHX-UN blades could react to a detonation which is typically found with the supersonic shock wave produced by such an ignition. We managed to repeat several times a fully closed to fully open louver blade in 11 to13 milliseconds without any vent parts becoming dislodged or structurally impaired. At these explosion rates there was a distortion of the vent flange but in normal installations the flange is on the inside of the enclosure as opposed to just being held in place by 4 x M6 nuts and bolts. We are currently in the process of doing pressure readings of these kinds of explosions and will put a maximum recommended operating pressure to the product soon.

Blast Features of SHX UN Pressure Relief Vent

1. Maximum Enclosure pressure potential 6.8 BAR (Propane. Possible 20bar to be updated re Acetylene)
2. Reaction time from closed to open 11ms
3. 4 hour fire rated.
4. Standard Item supplied off the shelf in all sizes.
5. 300, 500, 700, and 1000 sizes available
6. Can be motorised open for ventilation re (SHX UN MOT)

AFP Air Tech Ltd
Morden Lodge | Morden Hall Road | Morden | Surrey | SM4 5JD
Tel: 020 8819 5740 | Email: sales@afpairtech.co.uk | Website: www.afpairtech.co.uk