Australian Fire Technologies

Pressure Relief Venting

Australian Fire Technologies

It is necessary to verify the operation of any over / under pressurisation vents installed within the hazard area during the Room Fan Integrity Test procedure.

It is the responsibility of the building owner to advise the contractor of the strength of the protected enclosure.

Fan Testing should be used prior to the selection / installation of the Gaseous Fire Suppression System to confirm venting requirements

STRENGTH AND ALLOWABLE PRESSURE FOR AVERAGE ENCLOSURES		
Construction Type	**Typical Structures**	**Allowable over-pressure, Pa**
Light	Lightweight partitions including glazing	250
Normal	Brick	500
Vault	Reinforced Concrete	1000

Notes:-

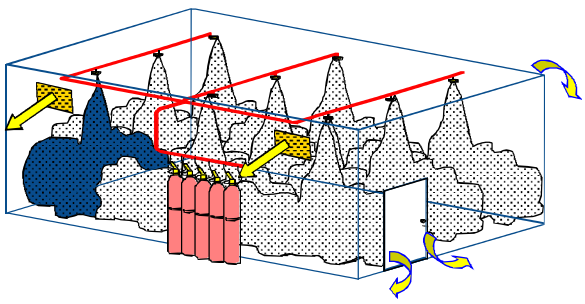
- The above table has been sourced from the previous Australian Standard AS 4214 – 2002, The University of Manchester and the UK Building Code.
- With large fires, the negative pressure resulting from the discharge of halocarbon / synthetic agents should also be considered.

Pressure Relief Venting
Australian Fire Technologies
Introduction

Below is an extract from Australian Standard AS ISO 14520.1 clause 7.4.1 pertaining to the requirements for venting.

7.4 Enclosures

7.4.1 The protected enclosure shall have sufficient structural strength and integrity to contain the extinguishant discharge. Venting shall be provided to prevent excessive over- or underpressurization of the enclosure.



Pressure Relief Venting — Testing

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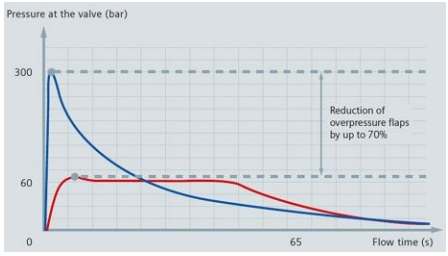
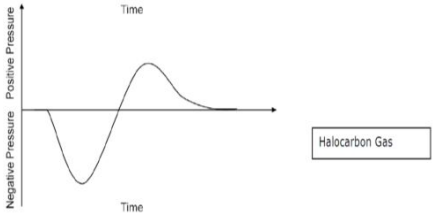
Considerations:

- Room over / under pressures
- Inert Gases – Consideration for Room Overpressure only
- Synthetic Gases – Consideration for both Room Over & Under pressures



INERT GASES - OVERPRESSURE



SYNTHETIC GASES- OVER / UNDER PRESSURE

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1. Document from Fire Industry Association (FIA) UK ***"Guidance on the pressure relief and post discharge venting of enclosures protected by gaseous fire fighting systems"***
2. Design Calculator Tool.
3. Final Verification via Room Fan Integrity Test procedure.

Fire Industry Association

Pressure Relief Venting

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Testing

1. FIA (Fire Industry Association) “Guidance on the pressure relief and post discharge venting of enclosures protected by gaseous fire fighting systems” vents should have a Minimum operating pressure for PRD’S of at least 50 Pascal’s to avoid nuisance opening
2. It also may be acceptable to take into account the natural leakage area (ELA) of the enclosure as determined by the room fan integrity test.
3. LPG Fire Australia are the distributors of the PUMA range of Pressure Relief Dampers.
4. The PUMA PRD will commence opening at approximately 60pa, depending on the natural ELA of the enclosure.
5. An extremely “tight” enclosure may get the PRD opening at 60pa dependant on the “natural” leakage measured in the enclosure from the fan test.
6. Part of the commissioning procedure is that the installation / maintenance contractor would test the PRD by using the fan integrity test equipment to verify the PRD’s operating pressure

Pressure Relief Venting

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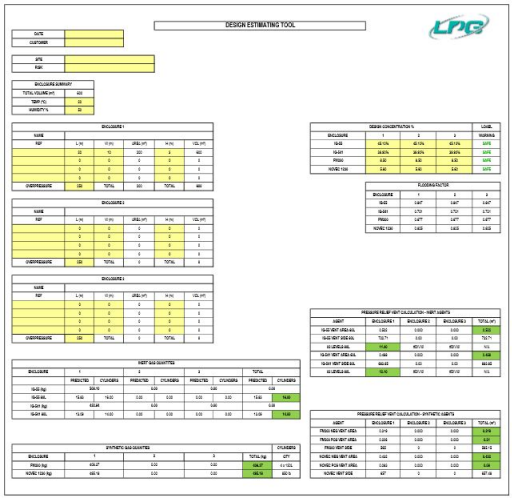
Design Calculator Tool

Inert Agents Example



Pressure Relief Venting — Australian Fire Technologies — Design Calculator Tool

Inert Agents Example

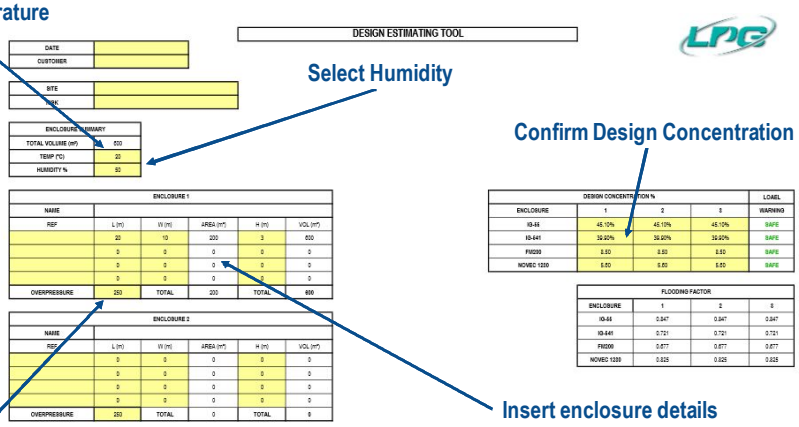
Select temperature

Select Humidity

Confirm Design Concentration

Insert enclosure details

Insert maximum overpressure (250, 500 or 1,000pa)



Pressure Relief Venting — Australian Fire Technologies — Design Calculator Tool

Inert Agents Example

INERT GAS QUANTITES								
ENCLOSURE	1		2		3		TOTAL	
	PREDICTED	CYLINDERS	PREDICTED	CYLINDERS	PREDICTED	CYLINDERS	PREDICTED	CYLINDERS
IG-55 (kg)	508.10		0.00		0.00		0.00	
IG-55 80L	15.83	16.00	0.00	0.00	0.00	0.00	15.83	16.00
IG-541 (kg)	432.84		0.00		0.00		0.00	
IG-541 80L	13.09	14.00	0.00	0.00	0.00	0.00	13.09	14.00

SYNTHETIC GAS QUANITIES					CYLINDERS
ENCLOSURE	1	2	3	TOTAL (kg)	QTY
FM200 (kg)	406.37	0.00	0.00	406.37	4 x 120L
NOVEC 1230 (kg)	495.18	0.00	0.00	495.18	850 lb

Cylinder sizes and gas quantities are is calculated here for all agents

Pressure Relief Venting — Australian Fire Technologies — Design Calculator Tool

Inert Agents Example

PRESSURE RELIEF VENT CALCULATION - INERT AGENTS				
AGENT	ENCLOSURE 1	ENCLOSURE 2	ENCLOSURE 3	TOTAL (m²)
IG-55 VENT AREA 80L	0.522	0.000	0.000	0.522
IG-55 VENT SIDE 80L	722.71	0.00	0.00	722.71
02 LEVELS 80L	11.40	#DIV/0!	#DIV/0!	N/A
IG-541 VENT AREA 80L	0.468	0.000	0.000	0.468
IG-541 VENT SIDE 80L	683.85	0.00	0.00	683.85
02 LEVELS 80L	12.10	#DIV/0!	#DIV/0!	N/A

Estimated vent size is calculated here

PRESSURE RELIEF VENT CALCULATION - SYNTHETIC AGENTS				
AGENT	ENCLOSURE 1	ENCLOSURE 2	ENCLOSURE 3	TOTAL (m²)
FM200 NEG VENT AREA	0.319	0.000	0.000	0.319
FM200 POS VENT AREA	0.206	0.000	0.000	0.21
FM200 VENT SIDE	565	0	0	565.15
NOVEC NEG VENT AREA	0.432	0.000	0.000	0.432
NOVEC POS VENT AREA	0.083	0.000	0.000	0.08
NOVEC VENT SIDE	657	0	0	657.48

Pressure Relief Venting — Australian Fire Technologies — Design Calculator Tool

Inert Agents Example

Select vent from PUMA data sheet

Twelve Vent Sizes Available

Model Number	Free Vent Area in m²	Hole Cut-out for FIS Only	Weight kg	Hole Cut-out for FIS & CF or CF Only	Weight kg	Hole Cut-out for FIS, TD/ WS & CF	Weight kg	Weather Louvre Free Vent Area in m²
		Width x Height		Width x Height		Width x Height		
PRD 150	0.021	205 x 205	4.35	215 x 215	6.9	225 x 225	12	0.02
PRD 225	0.042	280 x 280	6.0	290 x 290	10.0	300 x 300	16	0.04
PRD 300	0.079	355 x 355	7.4	365 x 365	12.4	375 x 375	20	0.072
PRD 375	0.124	430 x 430	8.75	440 x 440	14.25	450 x 450	23	0.104
PRD 450	0.178	505 x 505	12.0	515 x 515	17.25	525 x 525	28	0.143
PRD 525	0.252	580 x 580	16.35	590 x 590	26.1	600 x 600	31.2	0.188
PRD 600	0.317	655 x 655	20.6	665 x 665	32.45	675 x 675	45	0.24
PRD 675	0.417	730 x 730	25.0	740 x 740	40.0	750 x 750	52	0.297
PRD 750	0.515	805 x 805	31.85	815 x 815	47.85	825 x 825	64	0.36
PRD 825	0.623	880 x 880	34.5	890 x 890	52.5	900 x 900	72	0.43
PRD 900	0.741	955 x 955	37.0	965 x 965	57.5	975 x 975	76	0.51
PRD 975	0.870	1030 x 1030	39.5	1040 x 1040	62.5	1050 x 1050	81.5	0.59

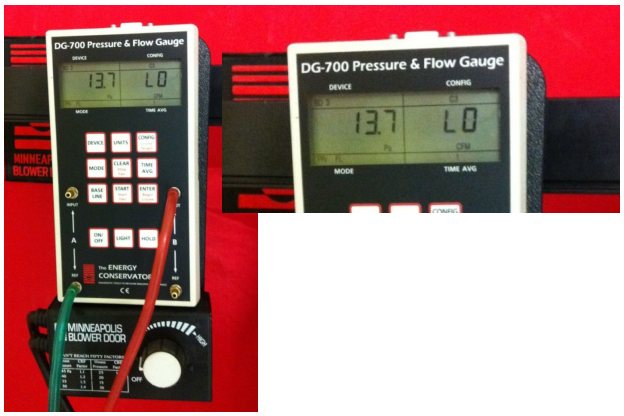
For Inert Gas Systems such as IG-541, IG-55 use the PRD vent

PRD Fire Integrity Section (FIS)
Telescopic Duct (TD) and Cat Flap (CF)
Typical Order Code -

PRD 300 FIS-0-TD-CF

Step 1:-

Pressurise room using Fan Test Equipment by slowly ***increasing*** the Room Pressure noting the Pressure the Vent operates / opens from on the DG900 controller

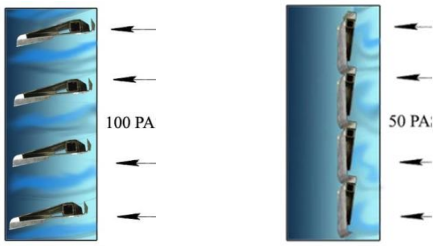


Step 2:-

Record the Pressure from the DG900 Controller to which the vent operated.

If applicable enter the details into the fan integrity test software

Vent should operate between 50 to 100pa noting maximum allowable Room Overpressure (i.e.:- 1,000pa)

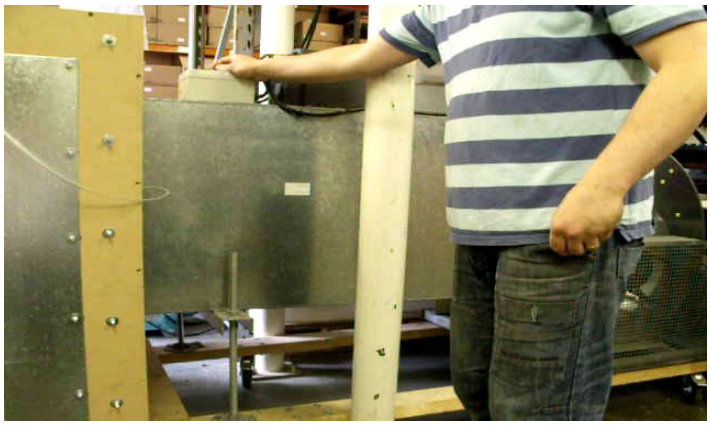


Pressure Relief Venting Australian Fire Technologies Testing – Inert Agents

Pressure Relief Venting

Australian Fire Technologies

Testing – Inert Agents



Pressure Relief Venting

Australian Fire Technologies

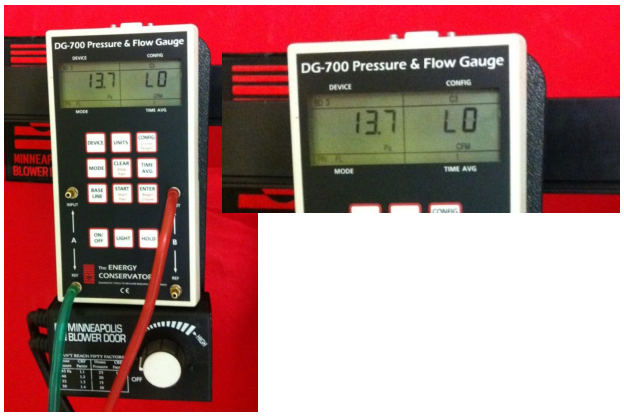
Testing – Inert Agents

For Synthetic Gas Systems such as FM200 and NOVEC use the DF PRD Dual Flow Pressure Relief Vent

Pressure Relief Venting Australian Fire Technologies Testing – Synthetic Agents

Step 1:-

Pressurise room using Fan Test Equipment by slowly ***increasing*** the Room Pressure noting the Pressure the Vent opens on the DG900 controller



Step 2:-

Record the Pressure from the DG900 Controller to which the vent operated.

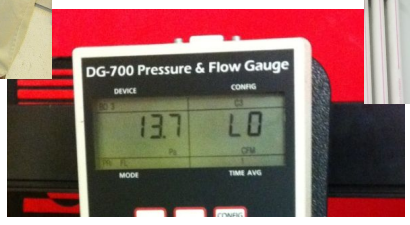
If applicable enter the details into the fan integrity test software

Vent should operate between 50 to 100pa noting maximum allowable Room Overpressure (i.e.:- 1,000pa)

Pressure Relief Venting Australian Fire Technologies Testing – Synthetic Agents

Step 3:-

Turn the Fan around and ***Depressurise*** room using Fan Test Equipment by slowly ***increasing*** the Room Pressure noting the Pressure the Vent opens on the DG900 controller



Step 4:-

Record the Pressure from the DG900 Controller to which the vent operated.

If applicable enter the details into the fan integrity test software

Vent should operate between 50 to 100pa noting maximum allowable Room Overpressure (i.e.:- 1,000pa)

Pressure Relief Venting Australian Fire Technologies Testing – Synthetic Agents

Pressure Relief Venting

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Examples

No installed Pressure Relief Vent - Inert Gas System

Pressure Relief Venting

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Examples

No installed Over / Under Pressure Relief Vent - FM200 System

Pressure Relief Venting

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Examples

No installed Over / Under Pressure Relief Vent - FM200 System

Pressure Relief Venting

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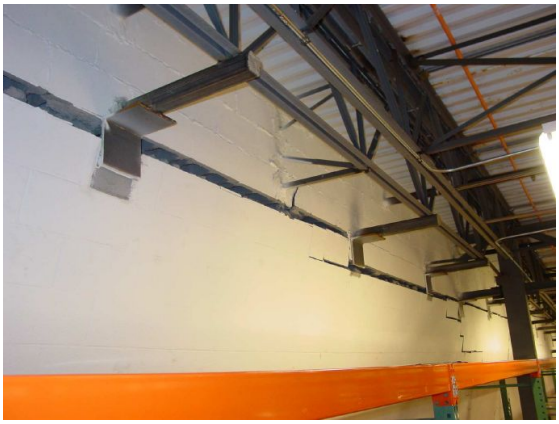
Examples

No installed Over / Under Pressure Relief Vent - FM200 System



Pressure Relief Venting

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Examples

No installed Over / Under Pressure Relief Vent - FM200 System

Pressure Relief Venting

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Examples

No installed Over / Under Pressure Relief Vent - FM200 System

Pressure Relief Venting

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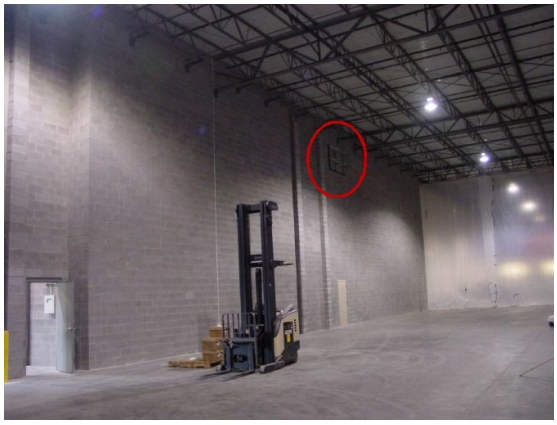
Examples

Installed Over / Under Pressure Relief Vent - FM200 System



Pressure Relief Venting

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Examples

Installed Over / Under Pressure Relief Vent - FM200 System

Pressure Relief Venting

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Examples

Installed Over / Under Pressure Relief Vent - FM200 System

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QUESTIONS ?