Software



FanTestic Integrity (Venting Calculator)



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1 Installation instructions

While FanTestic Integrity software may identify clean agent peak pressure and hold time risks, use of this software does not in any way guarantee the elimination of those risks.

1.1 Minimum system requirements

- Microsoft Windows O/S: XP (SP2 or greater) or newer (Vista/7/8) –current with all updates
- Processor: 1 GHz
- RAM: 512 MB
- Disk space: 600MB (32-bit) or 1.5 GB (64-bit)
- Microsoft Word: 2007/2010+ (or Word 2003 with 2007 support add-in)
- Internet connection with Microsoft Internet Explorer (for automatic software updates)
- .NET 4.0 framework (will update automatically with the FanTestic Integrity installation)

1.2 Download FanTestic Integrity

Go to: <u>http://www.retrotec.com/support/software-downloads</u>

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(p://www.retrotec.com	/support/softwar	e-downloads	s 🔞 ک – ک	oftware & Drive	er Downloa	a ×	- Pl =	<u></u>
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Products -	Applications -	Training	Support	Photos & Videos	Contact	Blog	Locate a Test	er	
Softwa	re Downloa	ads							
Testing a	nd Reporting S	oftware							
FanTestic	c (Lite/Pro/6/24)								
	0		1 C C C C C C C C C C C C C C C C C C C	tion, data collection, ar			Download	Learn More	
			79-10 and AS	TM 1827, ATTMA TSL1	and ATTMA 1	TSL2,	Dominous	Loanninoro	
CGSB	49.10, EN 13829, U	SACE							
FanTestic	c Integrity								
Enclosu	ure Integrity testing	software for ca	alculating and	d reporting Hold times,	Peak Pressu	res, and	Download	Learn More	
				fire supression system	S.		Dominoad	Leannmore	
In comp	pliance with standa	rds: NFPA 200	1, ISO 14520,	EN 15004					

Click the "Download" button next to FanTestic Integrity

			and the second second			
	-)	🛞 ht	://www. retrotec.com /software/integri 🎗 👻 🕻	🛞 Integrity	×	6 😪 🔅
F	ile Edit	View	Favorites Tools Help			
	Ret	rote				
	Inte					
	Inco	Jyn				
	Nama					
	Name:	11	egrity			
	Version	n: 5	.10.13			
	Publish	er: R	roter			
	T GDIISH					
	The follo	owing p	requisites are required:			
		• D	32 USB Device Driver			
		• M	rosoft .NET Framework 4 (x86 and x64)			
			dows Installer 3.1			
			nts are already installed, you can <u>launch</u> the a nstall the prerequisites and run the application		le	
	Inst	all				
			<u>Retrotec Customer Support</u> :: <u>C</u>	ickOnce and .NET Framework Resour	ces	
		_				

- Click the "Install" button on the window that opens.
- When prompted with "Do you want to run or save setup.exe?" click on the "Run" button.

	http://www.retrotec.com/software/integri 🔎 🕆 🖒 😭 Integrity 🗙 👘 🏠 🔅								
File Edit Vie	ew Favorites Tools Help								
Retrot	Retrotec								
Integr									
Integr	icy								
Name:	Integrity								
Version:	5.5.10.13								
Publisher:	Patratac								
Publisher:	Renolec								
The following	g prerequisites are required:								
	DM32 USB Device Driver								
	Microsoft .NET Framework 4 (x86 and x64)								
•	Windows Installer 3.1								
	ponents are already installed, you can <u>launch</u> the application now. Otherwise, click the / to install the prerequisites and run the application.								
button below									
Install									
	Do you want to run or save setup.exe (431 KB) from retrotec.com ?								
	Run Save 🔻 Cancel								

- If not prompted, go to the Downloads menu option on your web browser and double-click on the file you have just downloaded (which is called "setup.exe").
- The "Application Install Security Warning" window will open:



• click on the "Install" button.

(2%) Installing Integrity
Installing Integrity This may take several minutes. You can use your computer to do other tasks during the installation.
Name: Integrity
From: www.retrotec.com
Downloading: 625 KB of 28.1 MB
Cancel

- If the User Account Control (UAC) asks for permission, you must give administrator permission for the software to install the USB driver.
- After installation, FanTestic Integrity will open on your desktop.

Retrotec FanTestic Integrity (5.5.10.23)		x
File Test History Tools Settings Help		
Test History	Enclosure leakage design (Show details))
NEPA-US 2014-02-11 2210	- -	+

The first time you run FanTestic Integrity, you need to make some choices about how you will use FanTestic Integrity – access from the "Settings" menu as described in the next sections.

1.3 Start FanTestic Integrity

There are two ways to start the program:

- Click on Windows "Start Menu" → "All Programs" → "Retrotec" → "FanTestic Integrity",
- or click the FanTestic Integrity icon
 - on your desktop.

FanTestic Integrity (FTI) will run in demo mode with full functionality for 60 days after you first install. Once the demo version expires, you will not be able to generate the MS Word reports or export your test data to MS Excel. You will still be able to enter test data and see the results on-screen.

Obtain a license and instructions for activating the software with the license before your demo expires by contacting <u>sales@retrotec.com</u>. The license will be valid for the period of time specified for the license, and once the license expires, you will not be able to generate the MS Word reports or export your test data to MS Excel. You will still be able to enter test data and see the results on-screen.

If your demo or license has expired you will see a dialog window similar to the following when you start FanTestic Integrity:

	23
Your demonstration of this software expired on 2012-11-16. Please contact Retrotec Sales via email at sales@retrotec.com for licensing assistance.	
ОК	

1.4 Enter a license key

- Open FanTestic Integrity, if not already open.
- Once in the program click "Settings"

File 1	Fest History	Tools	Settings	Help
New test - NFPA 200		001 (201	Cho	oose formula to use for peak pressure calculation
	Test	Test History	Cha	nge Standard used for new tests
	Test		Ente	er license details
NEPA 2	NFPA 2014-02-24 1345		Cha	ange language
			Adv	vanced - view or change default program parameters

• Then click "Enter license details".

Options		
airflow systems since 1980 www	v.retrate.com	
FanTestic Integrity, Version # 5.5.26, Demo license Expired		
Install License Key		
Select a standard		*
NFPA 2001 (2012 ed.), metric In compliance with NFPA 2001 (2012 edition) Annex	C, metric	
NFPA 2001 (2012 ed.), imperial In compliance with NFPA 2001 (2012 edition) Annex	x C, imperial	
ISO 14520 (2006 ed.), metric In compliance with ISO 14520 (2006 edition) Annex E,	metric	
C EN 15004 (2008 ed.), metric In compliance with EN 15004 (2008 ed.) Annex E, metric	ic	
Select an older edition of a standard		
ISO 14520 (2000 ed.), metric In compliance with ISO 14520 (2000 edition) Annex E,	metric	
NFPA 2001 (2004 ed.), imperial In compliance with NFPA 2001 (2004 edition) Annex	x C, imperial	
NFPA 2001 (2004 ed.), metric In compliance with NFPA 2001 (2004 edition) Annex	C, metric	
		*
Software user's company	Retrotec	
Software user's name		
Software user's email		
Language to use	English (United States) -	
		OK Cancel

• Click on the "Install License Key" button

Options	
	tec
FanTestic Integrity, Version # 5.5.26, Demo license Expired	
Paste in the license key below.	
	Paste from clipboard Install License k Cancel
Select a standard	·
NFPA 2001 (2012 ed.), metric In compliance with NFPA 2001 (2012 edition) Annex	C, metric E
NFPA 2001 (2012 ed.), imperial In compliance with NFPA 2001 (2012 edition) Anne	ex C, imperial
ISO 14520 (2006 ed.), metric In compliance with ISO 14520 (2006 edition) Annex E	, metric
C EN 15004 (2008 ed.). metric In compliance with FN 15004 (2008 ed.) Annex F met	
Software user's company	Retrotec
Software user's name	
Software user's email	
Language to use	English (United States)
	OK Cancel

- then copy and paste the license key from the email you received into the text box that appears, being sure to include the "===START_KEY===" and "===END_KEY===" portion of the key. If selecting from an email, be sure that the email has not inserted any odd items into the string, such as an "emailto" link. The email containing the key that is sent out from Retrotec will be a "Text only" email, not HTML based, in order to try to minimize license corruption.
- Click on the "Install License" button below the text box.

Options		
		tec
FanTestic Integrity, Version # 5	5.5.20, Demo license Expired	
Paste in the license key below.		
	===START_KEY===xxxxxxxxxxxxxxxxxxxxx	END_KEY===
		Paste from clipboard Install License K Cancel
		Paste from clipboard
Select a standard		*
	mpliance with NFPA 2001 (2012 edition) Anne	C. metric
	ompliance with NFPA 2001 (2012 edition) Ann	
	npliance with ISO 14520 (2006 edition) Annex	
○ EN 15004 (2008 ed.). metric In com	poliance with FN 15004 (2008 ed.) Annex F. me	tric *
So	oftware user's company	Retrotec
	Software user's name	
	Software user's email	
	Language to use	English (United States)
		OK Cancel

• Next, select a standard, and then fill in the user name and email address and then click "OK". "Software user's company" will be filled in automatically from the license that was entered.

1.5 Select a testing standard to use

- Open FanTestic Integrity, if not already open.
- Click on Settings:

File Test History Tools	Settings	Help	
New test - NFPA 2001 (201	Cho	oose formula to use for peak pressure calculation	E
	Cha	nge Standard used for new tests	
Test History	Ente	er license details	ess
NFPA 2014-02-24 1345	Cha	nge language	
NFPA 2014-02-24 1545	Adv	anced - view or change default program parameters	

• then click on "Change Standard used for new tests"

Options				
airflow systems since 1980 www	w.retrolec.com			
FanTestic Integrity, Version # 5.5.26, Demo license Expired				
Install License Key				
Select a standard		*		
NFPA 2001 (2012 ed.), metric In compliance with NFPA 2001 (2012 edition) Annex	C, metric			
NFPA 2001 (2012 ed.), imperial In compliance with NFPA 2001 (2012 edition) Anne	x C, imperial			
ISO 14520 (2006 ed.), metric In compliance with ISO 14520 (2006 edition) Annex E	, metric			
EN 15004 (2008 ed.), metric In compliance with EN 15004 (2008 ed.) Annex E, met	ric			
Select an older edition of a standard				
SO 14520 (2000 ed.), metric In compliance with ISO 14520 (2000 edition) Annex E	, metric			
NFPA 2001 (2004 ed.), imperial In compliance with NFPA 2001 (2004 edition) Annex C, imperial				
🔘 NFPA 2001 (2004 ed.), metric In compliance with NFPA 2001 (2004 edition) Annex	C, metric			
		Ŧ		
Software user's company	Retrotec			
Software user's name				
Software user's email				
Language to use	English (United States)			
		OK Cancel		

- Next, select a standard from the list, and then click "OK". For NFPA, you can choose to see the values in metric units or imperial/mixed units (imperial units for all items except pressure is in Pascals). Access is also provided to doing calculations based on the old version of the standard, only for comparison with results from tests performed with the old and discontinued CA2001 software.
- Changes can be made any time, but a new test file must be created for the new settings to be used.
- If a test file is already open when changes are made, you will be warned before the software creates the new file. If you do not let the software create a new file at that point, the old file will remain open with the old settings until you click "File" → "New", or use the "New test" link on the Test History menu, to create a new test using the new standard you chose.

1.6 Change language for user interface (and generated reports)

File Test History Tools	Settings Help	
New test - NFPA 2001 (201	Choose formula to use for peak pressure calculation	F
	Change Standard used for new tests	H
Test History	Enter license details	essi
NFPA 2014-02-24 1345	Change language	
NFPA 2014-02-24 1345	Advanced - view or change default program parameters	



2 Calculate Pressure Relief Vent leakage area needed for system design

Enclosure leakage design (hide details)	
Start venting calculator Calculate Pressure Relief Vent new	eded for system design 🕐
Warning for Inert Agents: VdS and FIA equations use peak mass flow rates to calculate the "required vent area", and these have been defaulted to rates consistent with experiments. Entering smaller rates may result in undersized vents.	1200 1000 800 (e) 900 0 10 20 30 40 50 60 70 80 90 100 Time (sec)
Warning for Halocarbon Chemical Agents: VdS equations use peak mass flow rates to calculate the "required vent area" and assume only positive pressures occur during a discharge which is not consistent with experiments where negative peak pressures were often greater than the positive. FSSA or FIA equations are recommended.	100 -
Warning for gaseous Carbon Dioxide: VdS, FIA and NFPA12 equations use peak mass flow rates to calculate the "required vent area" and have been defaulted to rates consistent with experiments of other inert gases. Entering smaller rates may result in undersized vents.	1200 1000 800 600 200 0 10 200 0 10 20 10 20 30 40 50 60 70 80 90 100 100 100 100 100 100 100

2.1 Open Venting Calculator

Click on the "start venting calculator" button on the "Enclosure leakage design" expander tab.

Alternatively you can click on the Tools menu and use the "Calculate Pressure Relief Vent needed for system design" menu option:



The venting calculator will open:

Venting Calculator			Σ	23
File				
retroitec				
Venting Calculator				*
units $ extsf{eq}$ metric $ extsf{eq}$ mixed $ extsf{eq}$ imperial	enclosure			
venting equation FSSA for NFPA2001 🔻	Maximum flooded volume, V	1,000	m³	
enclosure leakage Standard NFPA 2001 (2012) 🔻	Maximum flooded height, H ₀	3	m	
discharge type Descending Interface 🔻	Lower leakage fraction, F	0.5		
Extinguishing Agent Info: performance criteria				
Agent Argon [IG-01]	Enclosure pressure limit:	500	Pa	
Initial concentration 40 %	Protected height	2.8	m	
Discharge time 60 s				
	Hold time	10	min	
	for given Hold time, enclosure leakage cannot b	e more than		
Enclosure conditions prior to discharge			cm²	
Temperature during discharge 20 c	% of this leakage used for venting	0	%	
	amount of this leakage used for venting		cm²	
Pressure Relief Vent area needed				
Calculate Positive PRV area needed is: cm ²				
No significant negative pressures occur during Inert Agent discharges.				

Figure 1: Venting Calculator using metric units

2.2 Choose units for values in the calculator

Venting Calculator

units	\odot metric \bigcirc mixed \bigcirc imperial

You may wish to change to mixed units (imperial for all units except pressure which is in Pascals) or imperial units (where pressure is in PSF).

Of the party of the P

🗈 Venting Calculator				
File				
Venting Calculator			*	
units 🔍 metric 💿 mixed 🔍 imperial	enclosure			
venting equation FSSA for NFPA2001 🔹	Maximum flooded volume, V	35,311 _{cu ft}		
enclosure leakage Standard NFPA 2001 (2012)	Maximum flooded height, H ₀	9.8 ft		
discharge type Descending Interface 🔻	Lower leakage fraction, F	0.5		
Extinguishing Agent Info: performance criteria				
Agent Argon [IG-01]	Enclosure pressure limit:	500 _{Pa}		
Initial concentration 40 %	Protected height	9.2 _{ft}		
Discharge time 60 s				
	Hold time	10 _{min}		
	for given Hold time, enclosure leakage cannot b	e more than		
Enclosure conditions prior to discharge		sq in		
Temperature during discharge 68 °F	% of this leakage used for venting	0 %		
	amount of this leakage used for venting	sq in		
Pressure Relief Vent area needed				
Calculate	Positive PRV area needed is:	sq in		
No significant negative pressures occur during Inert Agent discharges.				

Figure 2: using mixed imperial and metric units

2.3 Choose venting equation to use for peak pressure

ator	
units 🔍 metric	mixed imperial
venting equation	FSSA for NFPA2001 👻
enclosure leakage Standard	FSSA for NFPA2001
discharge type	VdS FIA
igent Info:	NFPA12 for CO2

2.3.1 Warning about venting equations

If you choose NFPA12, FIA or VdS, please heed the following warnings:



If you choose to use equations relying on peak mass flow rate to calculate peak pressure and minimum leakage required to relieve the peak pressure, entering smaller peak flow rates to override default values may result in under-estimating minimum venting area required. Such an under-estimation would lead to over-pressurization if a smaller than necessary vent is installed.

2.4 Choose enclosure leakage standard for calculating max hold time



2.5 Choose agent discharge model used in calculations

Select which type of fire suppression system discharge model will be assumed for calculation of the maximum leakage for the specified hold time.



There are two options, defined according to how the extinguishing agent behaves after a discharge in the enclosure:

"Descending Interface "– Agent is discharged at near-ceiling level into the enclosure. An 'interface' with a constant concentration (known as the Initial Concentration) descends from the discharge level as gas leaves the enclosure through leaks. The time it takes for this 'interface' to reach the Minimum protected height is defined as the "hold time". "Continuous Mixing" – Agent is discharged at near-ceiling level into the enclosure. Fans circulate gas throughout the room, resulting in a uniform agent concentration. This concentration begins at Initial Concentration and reduces until it eventually reaches the specified Minimum Concentration. The time it takes for the Initial Concentration to reach the Minimum Concentration is defined as the "hold time".

2.1 Choose the extinguishing agent

The list of extinguishing agents will depend on the choices in the venting equation and enclosure leakage standard drop downs.

• "Agent"

Select which agent is used for the enclosure's fire suppression system.

venting equation	SSA for NFPA2001 💌
enclosure leakage Standard	NFPA 2001 (2012) 🔻
discharge type De	scending Interface 🔻
jent Info:	per
Agent	Argon [IG-01] 🔹
	Argon [IG-01]
Initial concentration	
Discharge time	ARGO55 [IG-55] ECARO-25 [HFC-125]
	FE-13 [HFC-23]
	FE-25 [HFC-125]
	FE-227 (NFPA) [HFC-227ea] 🛽
ions prior to discharge	FM200 (NFPA) [HFC-227ea]
tons prior to discharge	IG-541
Temperature during discharge	IG-55
i competence denning enseminge	INERGEN [IG-541]
	NAF S 125 [HFC-125]
	NAF S 227 [HFC-227ea]
	Novec 1230 [FK-5-1-12]
	ProInert [IG-55PI]
	PyroShield [IG-55]
Calculate	SAPPHIRE [FK-5-1-12]

Figure 3: Available extinguishing agents for NFPA2001 with FSSA

	1
venting equation	FSSA for NFPA2001 🔻
enclosure leakage Standard	ISO 14520 (2006) 🔻
discharge type De	escending Interface 🔻
it Info:	ре
Agent	Argon [IG-01]
Initial concentration	Argon [IG-01] Argonite [IG-55]
Discharge time	ARGO55 [IG-55]
Temperature during discharge	FE-13 [HFC-23] FE-25 [HFC-125] FE-227 (ISO) [HFC-227ea] FM200 (ISO) [HFC-227ea] IG-541 IG-55 INERGEN [IG-541] NAF S 125 [HFC-125] NAF S 227 [HFC-227ea] Novec 1230 [FK-5-1-12] ProInert [IG-55PI] PyroShield [IG-55] SAPPHIRE [FK-5-1-12]

Figure 4: Available extinguishing agents for ISO14520/EN15004 with FSSA

Venting Calculator	
units 🔍 metric 🧕	mixed imperial end
venting equation	VdS 🔹
enclosure leakage Standard	ISO 14520 (2006) 🔻
discharge type De	scending Interface 👻
Extinguishing Agent Info:	per
Agent	Argon [IG-01] 🔹
	Argon [IG-01]
Initial concentration	Argonite [IG-55]
Discharge time	ARGO55 [IG-55] CO2
	CE21
Peak mass flow rate	ECARO-25 [HFC-125]
	FE-13 [HFC-23]
Enclosure conditions prior to discharge	FE-25 [HFC-125]
	FE-227 (ISO) [HFC-227ea]
Temperature during discharge	FE-36 [HFC-236fa] FIC-13I1
	FM200 (ISO) [HFC-227ea]
	Halon [Halon 1301]
	Halotron II [HFC Blend B]
	IG-541 —
	IG-55 ure
Calculate	INERGEN [IG-541]
	NAF SIII [HCFC Blend A] NAF S 125 [HFC-125]
No significant negative pressures occur during Inert Ag	NAF S 227 [HFC-227ea]
	Novec 1230 [FK-5-1-12]
	ProInert [IG-55PI]
	PyroShield [IG-55]
	SAPPHIRE [FK-5-1-12]
\wedge	

Figure 5: Available extinguishing agents for ISO14520/EN15004 with VdS

Of the sector of

ig Calculator

units 🔘 metric 🤇	mixed imperial enclo
venting equation	Vds
enclosure leakage Standard	NFPA 2001 (2012) 🔻
discharge type	escending Interface 🔻
uishing Agent Info:	perfo
Agent	Argon [IG-01] 🔹
	Argon [IG-01]
Initial concentratio	Argonite [10-55]
Discharge tim	ARGO55 [IG-55]
Peak mass flow rat	CF3I
ure conditions prior to discharge	FE-13 [HFC-23] FE-241 [HFC-124] FE-25 [HFC-125]
Temperature during discharg	FE-227 (NEPA) [HEC-227ea]
	FM200 (NFPA) [HFC-227ea]
	Halon [Halon 1301]
	Halotron II [HFC Blend B]
	IG-55 e R
	INERGEN [IG-541]
Calculate	NAF SIII [HCFC Blend A]
nificant negative pressures occur during Inert A	NAF S 125 [HFC-125]
	NAF S 227 [HFC-227ea]
	Novec 1230 [FK-5-1-12]
	ProInert [IG-55PI] PyroShield [IG-55]
	SAPPHIRE [FK-5-1-12]
A	

Figure 6: Available extinguishing agents for NFPA2001 with VdS



Figure 7: Only CO2 is available as an agent if NFPA12 equation is chosen

2.2 Enter extinguishing agent details

units 🔍 metric 🖉	mixed 🔍 imperia	al
venting equation	SSA for NFPA2001	•
enclosure leakage Standard	NFPA 2001 (2012)	•
discharge type De	scending Interface	•
ent Info:		_
Agent Argon [IG-01] 🔻		
Initial concentration	40	96
Discharge time	60	s

• "Initial concentration" [% volume]

The initial concentration, as a percent of volume, of agent in the enclosure immediately after a complete discharge (i.e. the concentration of agent at the beginning of the hold time). Defaulted to 40% for inert agents and 7% for halocarbon agents. It is used along with the entered enclosure volume to calculate the agent mass, behind the scenes.

• "Discharge time" [s]

The agent's discharge time in seconds. This value should be obtained from the fire suppression system design specifications. FanTestic Integrity defaults this value to typical discharge times: 60 s for inert agents and 10 s for halocarbon agents.

2.2.1 Case of Inert gas extinguishing agents with FSSA:

Uses a leak to volume ratio for the calculation of pressure relief vent area which depends on the chosen agent, so no peak mass flow needs to be entered. Thus the peak mass flow rate data entry box is not available in the user interface.

units 🤍 metric 🖉	mixed 🔍 imperia	al
venting equation	SSA for NFPA2001	•
enclosure leakage Standard	NFPA 2001 (2012)	•
discharge type De	scending Interface	•
gent Info:		_
Agent Argon [IG-01] 🔻		
Initial concentration	40	96
Discharge time	60	s

2.2.2 Case of Halocarbon gas extinguishing agents with FSSA and FIA:

Uses a leak to volume ratio for the calculation of pressure relief vent area which depends on the chosen agent, so no peak mass flow needs to be entered. Thus the peak mass flow rate data entry box is not available in the user interface.

units in	incurie.	macu	mpene	
venting equ	ation	FIA		•
enclosure leakage Star	ndard	NFPA 2001	1 (2012)	•
discharge ty	pe De	scending I	nterface	•
ent Info:				_
/	Agent	FE-25 [HFC	5-125]	•
Initial conce	ntration		7.5	96
Discha	rge time		10	s

2.2.3 Case of Inert gas extinguishing agents with VdS and FIA:

Uses a peak mass flow rate for the calculation of pressure relief vent area, which is defaulted to a value consistent with experiments for each agent.

venting equation	VdS 🔹
enclosure leakage Standard	NFPA 2001 (2012) 🔻
discharge type	Descending Interface 🔻
Extinguishing Agent Info:	
Agent	Argon [IG-01]
Initial concentrati	on 40 %
Discharge tir	me 60 s
Peak mass flow ra	120.0 Ib/s

2.2.4 Case of Halocarbon gas extinguishing agents with VdS:

Uses a peak mass flow rate for the calculation of pressure relief vent area, which is defaulted to a value consistent with experiments for each agent.

 Г
•
•
• •
•
96
s
lb/s

2.2.5 Case of gaseous CO2 extinguishing agent with NFPA12:

Uses a peak mass flow rate for the calculation of pressure relief vent area, which is defaulted to a value consistent with experiments.



2.3 Enter enclosure conditions during hold time

Enter the minimum anticipated temperature that the enclosure could experience during a discharge.

Enter the minimum and maximum relative humidity in %, in cases where it is necessary as outlined in the next sections:

2.3.1 Case of Inert gas extinguishing agents with FSSA:

Adjustments are made using temperature in the calculation of pressure relief vent area, so only temperature is available to be entered.

Enclosure conditions prior to discharge		
Temperature during discharge	68	٩F

2.3.2 Case of Halocarbon gas extinguishing agents with FSSA and FIA:

Adjustments are made using temperature and relative humidity in the calculation of pressure relief vent area, so all are available to be entered.

Enclosure conditions prior to discharge		
Temperature during discharge	68	°F
Minimum humidity, RH _{min}	30	96
Maximum humidity, RH _{max}	80	96

2.3.3 Case of Inert gas extinguishing agents with VdS and FIA:

Adjustments are made using temperature in the calculation of pressure relief vent area, so only temperature is available to be entered.

Enclosure conditions prior to discharge	
Temperature during discharge	68 _{°F}

2.3.4 Case of Halocarbon gas extinguishing agents with VdS:

Adjustments in VdS equations are made using temperature in the calculation of pressure relief vent area, so only temperature is available to be entered.



2.3.5 Case of gaseous CO2 extinguishing agent with NFPA12:

Adjustments are made using temperature in the calculation of pressure relief vent area, so only temperature is available to be entered.

Enclosure conditions prior to discharge		
Temperature during discharge	68	۰F

2.4 Enter enclosure details

35,311	cu ft
9.8	ft
0.5	
	9.8

• "Maximum flooded volume"

Calculate and enter the enclosure volume that is to be flooded with agent.

• "Maximum flooded height"

Enter the maximum flooded height, which is the height of the installed nozzles for the agent discharge.

• "Lower leakage fraction"

Enter a value between 0.15 and 0.5 which represents how much of the leakage occurs in the lower part of the room versus the total enclosure leakage. The default of 0.5 is the most conservative value.

2.5 Enter performance criteria

2.5.1 Case of "Descending interface" as discharge model

performance criteria

Enclosure pressure limit:	500	Pa
Protected height	9.2	ft
Hold time	10	min

• "Enclosure pressure limit"

Enter the pressure limit for the enclosure. Any peak pressure higher than this value is expected to result in structural damage.

- "Protected height" Enter the protected height (the highest level of combustibles). This height is usually measured to the top of the equipment you are trying to protect.
- "Specified hold time" The required Hold time for a passing test, also known as the "hold time".

2.5.2 Case of "Continuous mixing" as discharge model

performance criteria

Enclosure pressure limit:	500	Pa
Minimum concentration	35	96
Hold time	10	min

"Enclosure pressure limit"

Enter the pressure limit for the enclosure. Any peak pressure higher than this value is expected to result in structural damage.

• "Minimum concentration"

The final concentration in the enclosure at the end of the hold time

• "Specified hold time" The required Hold time for a passing test, also known as the "h

The required Hold time for a passing test, also known as the "hold time".

3 Calculate the maximum enclosure leakage to maintain the specified hold time

Click the "Calculate" button once all the data is entered in order to view the results; gray boxes show the calculated results and are not editable.



Choose the % of the enclosure leakage available that will be used as part of the leakage for peak pressure relief.

4 Calculate Pressure Relief Vent area needed

Enter your data into all the yellow boxes – the yellow boxes indicate required entry items without default values. They will turn green after entry.

Click the "Calculate" button once all the data is entered in order to view the results; gray boxes show the calculated results and are not editable.

Pressure relief vent area is the size of the vent that will be required, already taking into account that the specified percent of enclosure leakage will also be available for peak pressure relief. This additional leakage needs to be put in place so that Peak Pressure can be lowered to the point where the structural integrity of the enclosure is not compromised during agent hold time

4.1 Case of Inert gas extinguishing agents

Only positive pressure relief will be needed, so that is all that is calculated.

	Pressure Relief Vent area needed	
Calculate	Positive PRV area needed is:	sq in
No significant negative pressures occur during Inert Agent discharges.		

4.2 Case of Halocarbon gas extinguishing agents with FSSA and FIA:

As long as data is available defining the Leak to Volume ratio for the agent, both positive and negative pressure relief area will be calculated. All the agents in the list have data.

Calculate	Pressure Relief Vent area needed		
	Positive PRV area needed is:	sc	q in
	Negative PRV area needed is:	sc	q in

4.3 Case of Halocarbon gas extinguishing agents with VdS:

VdS equations assume only positive peak pressures will occur, so no negative PRV area can be calculated, even though experiments show that negative peak pressures usually form.

Calculate	Pressure Relief Vent area needed	
VdS equations assume only positive peak pressures occur which is not	Positive PRV area needed is:	sq in
consistent with experiments where negative peak pressures were often greater than the positive. FSSA or FIA equations are recommended.		

5 Save results to a file (.docx)

u (Venting Calculator
ſh	File
/ir	Generate Report
re re re re	Venting Calculator
re es	units 🔍 metric 🖲 mixed 🔍 in
Ŀ	venting equation FSSA for NFPA
re	enclosure leakage Standard NFPA 2001 (2
н	discharge type Continuous N
2	Extinguishing Agent Info:

Test files are normally saved on your local C: drive under [MyDocuments]\Retrotec\Tests.

If you enter a new file name, the Venting calculator will create a docx file with fields for each of the items in the user interface, and then put the values from the calculator into the file.

If you chose an existing docx file, which has already been created by the Venting calculator, the fields will be updated with the values from the calculator rather than creating a new file.

You will only be able to generate the .docx report file containing the results if you have a valid, non-expired license for FanTestic Integrity. If you do not have such a license, you will be limited to seeing results on the screen.

6 Troubleshooting

6.1 Report an Issue

If you experience a problem that you cannot fix by troubleshooting, make sure you have the latest version of FanTestic software, see section 1.2 . If you are still having problems even using the updated software:

- For Technical Support, contact <u>support@retrotec.com</u>
- E-mail bugs, comments or suggestions to: <u>bugs@retrotec.com</u>

In your email, describe the problem and when it occurs, and attach the following:

- The standard are you using (click "Tools" → "Settings" → "Change Standard" to check)
- Log file from [My Documents]\Retrotec\Logs
- Test file you are using, file extension .fxml
- Settings.xml file [My Documents]\Retrotec\AppData

• A screenshot of the software running or having the error

Each test has an associated log file that is saved on your C: drive, in the Retrotec folder. These logs will help Retrotec to determine where the problem occurred. You can access the log files in your local drive, in [My Documents]\Retrotec\Logs. A new log file is created for each day, named Log_yyyy-MM-dd.txt. If you leave FanTestic Integrity running over the course of multiple days, the log file will have the date of the day when FanTestic Integrity was initially started.

 Open Share 	with E-mail New folder			!≡ • [
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🍌 Logs	2010-05-14 9:00 AI	M File folder			
🎉 Reports	2010-05-13 8:39 AI	VI File folder			
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Logs Date modified:	2010-05-14 9:21 Al 2010-05-14 9:00 A ze * Share with * Ne Documents librar Logs Name Log_2010-5-12	M File folder	Type Text Document	Arrangi Size 48 KB	
Logs Date modified:	2010-05-14 9:21 Al 2010-05-14 9:00 ze Share with Ne Documents librar Logs Name	M File folder	Туре	Arrangi Size	

The .fxml test files can be found in your local drive, in [My Documents]\Retrotec\Tests folder, and are saved by default with the date and time in the name. Send the .fxml file having the date you began the test.

The Settings.xml file is found in your [My Documents]\Retrotec\AppData folder, and contains information troubleshooting personnel can use to diagnose the problem.

Screenshots are a way to show our Technical Support staff what your error looks like on your screen. This will help us to determine the best approach to fix the problem. To capture an image of the screen you are currently looking at, push the "Print Scrn" button on your keyboard. In order to attach this image as a file for us to view, you must paste it into a document. To do this, open a new Microsoft Word or Paint document, right click on your mouse and select "Paste" (or "Edit" \rightarrow "Paste"). The captured image of your screen should appear in the document. You can now save this document and include it as an attachment when you email the files to Retrotec.

7 License

E-mail license pricing inquiries to sales@retrotec.com . Once you receive your license key in the mail, ensure that you have the latest version of FanTestic Integrity installed on your computer and then refer

to section 1.4 for detailed instructions on entering the license into the latest version of FanTestic Integrity.

You will be able to generate the .docx report file containing the results when you have a valid, non-expired license.