



DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK

CITY OF PORTLAND BUILDING PERMIT



This is to certify that HILLER NE FIRE PROTECTION
of 240 Ballardvale St, Willmington, MA 01887

For installation at 70 BEDFORD ST
USM Science Building

Job ID: 2011-07-1826-ALTCOMM

CBL: 114A- A-001-001

has permission to install NFPA 2001 Inergen system for Data Center
provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of
the Statues of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of
the buildings and structures, and of the application on file in the department.

Notification of inspection and written permission procured
before this building or part thereof is lathed or otherwise
closed-in. 48 HOUR NOTICE IS REQUIRED.

A final inspection must be completed by owner
before this building or part thereof is occupied. If a
certificate of occupancy is required, it must be

Bj. [Signature]

(58)

Fire Prevention Officer

Code Enforcement Officer / Plan Reviewer

THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY
PENALTY FOR REMOVING THIS CARD

closed

SCANNED



PORTLAND MAINE

Strengthening a Remarkable City, Building a Community for Life • www.portlandmaine.gov

Director of Planning and Urban Development
Penny St. Louis

Job ID: 2011-07-1826-ALTCOMM
Installation of NFPA 2001 Inergen
System for the Data Center

For installation at:
71 BEDFORD ST
USM Science Building

CBL: 114A- A-001-001

Conditions of Approval:

Fire

The suppression system shall be installed in accordance with NFPA 2001, *Standard on Clean Agent Fire Extinguishing Systems*. A compliance letter is required.

Suppression system supervision shall be provided in accordance with NFPA 101, *Life Safety Code*, and NFPA 72, *National Fire Alarm and Signaling Code*.

Suppression system protection shall be maintained. Where the system is to be shut down for maintenance or repair, the system shall be checked at the end of each day to insure the system has been placed back in service.



Non-Water-Based Fire Suppression System Permit

If you or the property owner owes real estate or property taxes or user charges on any property within the city, payment arrangements must be made before permits of any kind are accepted.

Installation address: 70 Falmouth St. CBL: # 2011-10799 114A-A-1 *USM overlay*

Exact location: (within structure) 2nd Floor Computer Room #237

Type of occupancy(s) (NFPA & ICC): Data Center, Normally Un-Occupied

Building owner: University of Southern Maine, Portland Campus

Managing Supervisor: Jeffrey Kidd of Hiller NE Fire Protection License No: _____

Supervisor phone: (978) 657-5550 E-mail: jeffkidd@hillerne.com

Installing contractor: Dean & Allyn, Inc. License No: _____

Contractor phone: (207) 657-5646 E-mail: dnarvaez@deanandallyn.com

The suppression work to be done will be: New: Renovation: Addition to existing system:

This is an amendment to an existing permit: Yes: NO: Permit no: _____

System Type: Inergen

NFPA Standard: 2001 Edition: Year 2008

*Non-NFPA systems are not approved for use within the City of Portland.

Download a new copy of this document from www.portlandmaine.gov/fire for every submittal. Attach all working documents as required on electronic PDF's in addition to full sized plans.

COST OF WORK: \$20,000.00
PERMIT FEE: \$230.00
(\$10 PER \$1,000 + \$30 FOR THE FIRST \$1,000)

11-5-11

Submit all information to the Building Inspections Department, 389 Congress Street, Room 315, Portland, Maine 04101.

Prior to acceptance of any fire protection system, a complete commissioning and acceptance test must be coordinated with all fire system contractors and the Fire Department, and proper documentation of such test(s) provided.

All installation(s) must comply with NFPA and the Fire Department Technical Standard(s).

Applicant signature: Jeffrey A. Kidd Date: 9/26/2011

ANSUL
INERGEN DESIGNER
Version 2.1.2

Data file name: \\Mac-server\engineering
g\Job Folder\NE2471-University of Southern Maine (Langford & Low)\Calculations\A-2471-1r0.in
Job: NE2471
Customer: Langford & Low
Address: 70 Falmouth St.
Science Building
Portland ME 04104
REMARKS: University of Southern Maine

Hazard Area Information

Area: Data Center

Design concentration 34.2% at 65° Fahrenheit
Estimated maximum concentration 50.2% at maximum hazard temperature 75° Fahrenheit
Gross volume of enclosure 6088 cubic feet
Structural volume reductions 429.9 cubic feet
Net volume of enclosure 5658.3 cubic feet
Minimum INERGEN required 2393.5 cubic feet
Approximate INERGEN supplied 3912.9 cubic feet
Flooding factor .423 cubic feet of INERGEN per cubic feet of enclosure volume
Maximum allowable wall strength 5.0 lbs./sq.ft.
Area consists of one volume
Volume 1: Length 42.4 ft Width 17.3 ft Height 8.3 ft
2 nozzles. Nozzle identifiers: 301, 302

Area: Data Center; Subfloor

Design concentration 34.2% at 65° Fahrenheit
Estimated maximum concentration 50.2% at maximum hazard temperature 75° Fahrenheit
Gross volume of enclosure 587 cubic feet
Structural volume reductions 41.4 cubic feet
Net volume of enclosure 545.4 cubic feet
Minimum INERGEN required 230.7 cubic feet
Approximate INERGEN supplied 377.1 cubic feet
Flooding factor .423 cubic feet of INERGEN per cubic feet of enclosure volume
Maximum allowable wall strength 5.0 lbs./sq.ft.
Area consists of one volume
Volume 1: Length 42.4 ft Width 17.3 ft Height 0.8 ft
2 nozzles. Nozzle identifiers: 401, 402

Agent Storage Conditions

Number of cylinders: 10 each containing 429 cubic feet of INERGEN.
Total agent 4290 cubic feet
Engineering units (ft, cu ft, psia) are specified
Calculation based on 70 degree Fahrenheit pre-discharge Pipeline Temperature
Calculation based on fixed nozzle and pipe sizes

Pipe Data Input

Sec Start	Sec End	Nominal Pipe Size	Length (ft)	Elev (ft)	90's	Side Tee	Thru Tee	Union/ Cplg	Noz Dia	EqI (ft)
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1	2	1/2 - 40 T	0.01	0.00	0	0	0	0		38.00
2	12	2 - 80 W	5.00	0.50	2	1	3	0	10 cyl	0.00
12	14	2 - 80 T	0.00	0.00	0	0	0	0		Orifice
14	22	2 - 40 T	40.30	4.30	6	0	0	0		0.00
22	24	2 - 40 T	7.80	0.00	0	0	1	0		0.00
22	28	3/4 - 40 T	17.50	-9.30	1	1	0	0		0.00
24	301	1 1/4 - 40 T	6.80	-1.00	1	1	0	0	0.594	0.00
24	302	1 1/4 - 40 T	13.30	-1.00	1	1	0	0	0.594	0.00
28	401	3/8 - 40 T	8.50	-0.50	1	1	0	0	0.188	0.00
28	402	3/8 - 40 T	8.50	-0.50	1	1	0	0	0.188	0.00

2 (End of Data Input File Printout)

ANSUL
INERGEN DESIGNER
 UL listed EX4510, FMRC Approved (J.I.) 2Y0A9.AF, ULC listed CEx1151
 Version 2.1.2

Data file name: \\Mac-server\engineering
 g\Job Folder\NE2471-University of Southern Maine (Langford & Low)\Calculations\A-2471-1r0.in
 Job Number: NE2471

Pressure Drop Results (Continued)

Sec Start	Sec End	Nominal Pipe Size	Length (ft)	Equiv Length(ft)	Elev (ft)	Tee/ Mfld	Start psia	Term psia	Flow (cfm)
14	22	2 40 T	40.3	71.3	4.3		452	576	4898.9
22	24	2 40 T	7.8	11.2	0.0	THRU	576	573	4474.
22	28	3/4 40 T	17.5	23.7	-9.3	SIDE	576	569	424.9
24	301	1 1/4 40 T	6.8	17.2	-1.0	BULL	573	564	2239.2
24	302	1 1/4 40 T	13.3	23.7	-1.0	BULL	573	561	2234.7
28	401	3/8 40 T	8.5	12.2	-0.5	BULL	569	558	212.4
28	402	3/8 40 T	8.5	12.2	-0.5	BULL	569	558	212.4

Calculation based on 70 degree Fahrenheit pre-discharge Pipeline Temperature

Pipe and Fittings

Sec Start	Sec End	Nominal Pipe Size	Length (ft)	90's	Side Tee	Thru Tee	Unions/ Cplgs	Eql (ft)
1	2	1/2 40 T	0.0	0	0	0	0	Cyl Valve 38 ft
2	12	2 80 W	5.0	2	1	3	0	
12	14	2 80 W		0	0	0	0	Man. Orifice
14	22	2 40 T	40.3	6	0	0	0	
22	24	2 40 T	7.8	0	0	1	0	
22	28	3/4 40 T	17.5	1	1	0	0	
24	301	1 1/4 40 T	6.8	1	1	0	0	
24	302	1 1/4 40 T	13.3	1	1	0	0	
28	401	3/8 40 T	8.5	1	1	0	0	
28	402	3/8 40 T	8.5	1	1	0	0	

Nozzle Performance Summary

Nozzle Number	Nominal Pipe Size	Drill Number	Drill Diameter	Quantity (cu ft) Discharged	Area Name
301	1 1/4 40 T	19/32	0.593	1962.5	Data Center

2 (Continued)

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g\Job Folder\NE2471-University of Southern Maine (Langford & Low)\Calculations\A-2471-1r0.in
Job Number NE2471 for Langford & Low
Address: 70 Falmouth St.
Science Building
Portland ME 04104
REMARKS: University of Southern Maine

Agent Storage Conditions

Storage pressure is 2175 psia at 70 degrees Fahrenheit.
429 cubic feet of INERGEN stored in each of 10 cylinders.
Total agent in storage is 4290 cubic feet.
Time to discharge 3861 cubic feet (90% of INERGEN) is 69.7 seconds
Maximum pressure downstream of manifold orifice is 1246 psia

Concentrations

Area	Volume	95% Time (sec)	Cu Ft INERGEN	Maximum Concentration at Max. Temp.	Minimum Concentration at Min. Temp.	Requested Concentration at Min Temp.
Data Center	5658.3	28	3919.4	50.3% at 75°F	49.6% at 65°F	34.2% at 65°F
				Sea level equivalent oxygen: 10.4% at 75°F		
Data Center; Subfloor	545.4	29	370.6	49.6% at 75°F	49.0% at 65°F	34.2% at 65°F
				Sea level equivalent oxygen: 10.6% at 75°F		

Free Vent Calculation

Area	Peak Rate	Maximum Wall Strength	Minimum Free Vent Area
Data Center	8275.7 cfm	5.0 lbs./sq.ft.	316 sq. in.
Data Center; Subfloor	787.1 cfm	5.0 lbs./sq.ft.	30 sq. in.

Pressure Drop Results

Sec Start	Sec End	Nominal Pipe Size	Length (ft)	Equip Length(ft)	Elev (ft)	Tee/ Mfld	Start psia	Term psia	Flow (cfm)
1	2	1/2 40 T	0.0	38.0	0.0	MFLD	1033	1000	489.9
2	12	2 80 W	5.0	22.9	0.5	MFLD	1000	995	4898.9
12	14	ORIFICE .625 INCHES		DRILL NO. 5/8			995	452	4898.9

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g\Job Folder\NE2471-University of Southern Maine (Langford & Low)\Calculations\A-2471-1r0.in
Job Number: NE2471

Nozzle Performance Summary (Continued)

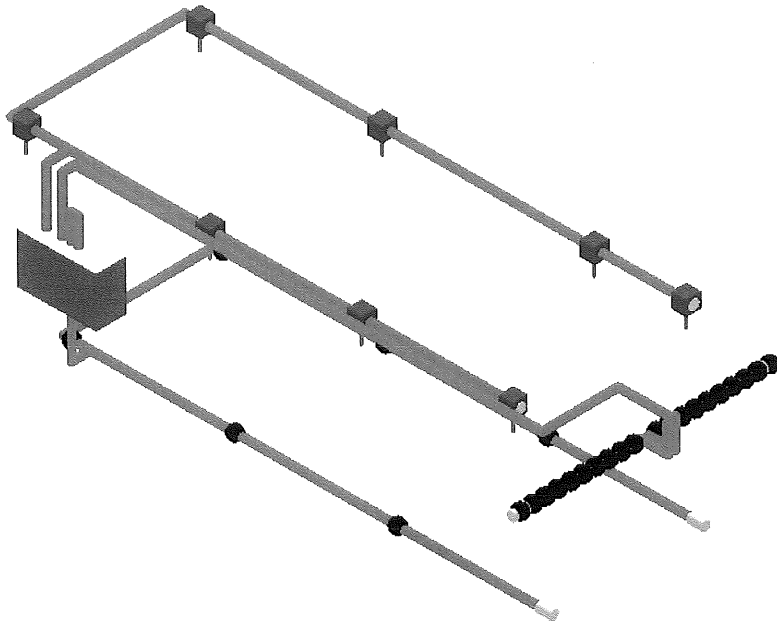
Nozzle Number	Nominal Pipe Size	Drill Number	Drill Diameter	Quantity (cu ft) Discharged	Area Name
302	1 1/4 40 T	19/32	0.593	1956.9	Data Center
401	3/8 40 T	3/16	0.187	185.3	Data Center; Subfloor
402	3/8 40 T	3/16	0.187	185.3	Data Center; Subfloor

Messages/Errors

ANSUL 150 bar INERGEN DESIGNER Version number 2.1.2
Calculation based on fixed nozzle and pipe sizes.
Calculation done on 8/10/2011 at 2:21:15 PM

Pipe schedule selected for pipe sizes downstream of the manifold orifice is based on the maximum pipe pressure for Grade A-53B, A-106B Seamless. To determine if other grades are acceptable, verify that the maximum pipe pressures for other grades are equal to or greater than the maximum anticipated downstream pressure.

Calculation by Hiller New England Fire Protection, Inc.
Engineering Department
240 Ballardvale St.
Wilmington MA 1887 USA
Telephone: 978-657-5550
Fax: 978-657-0016



Isometric View for VLP



Installation Data Pack for New Project

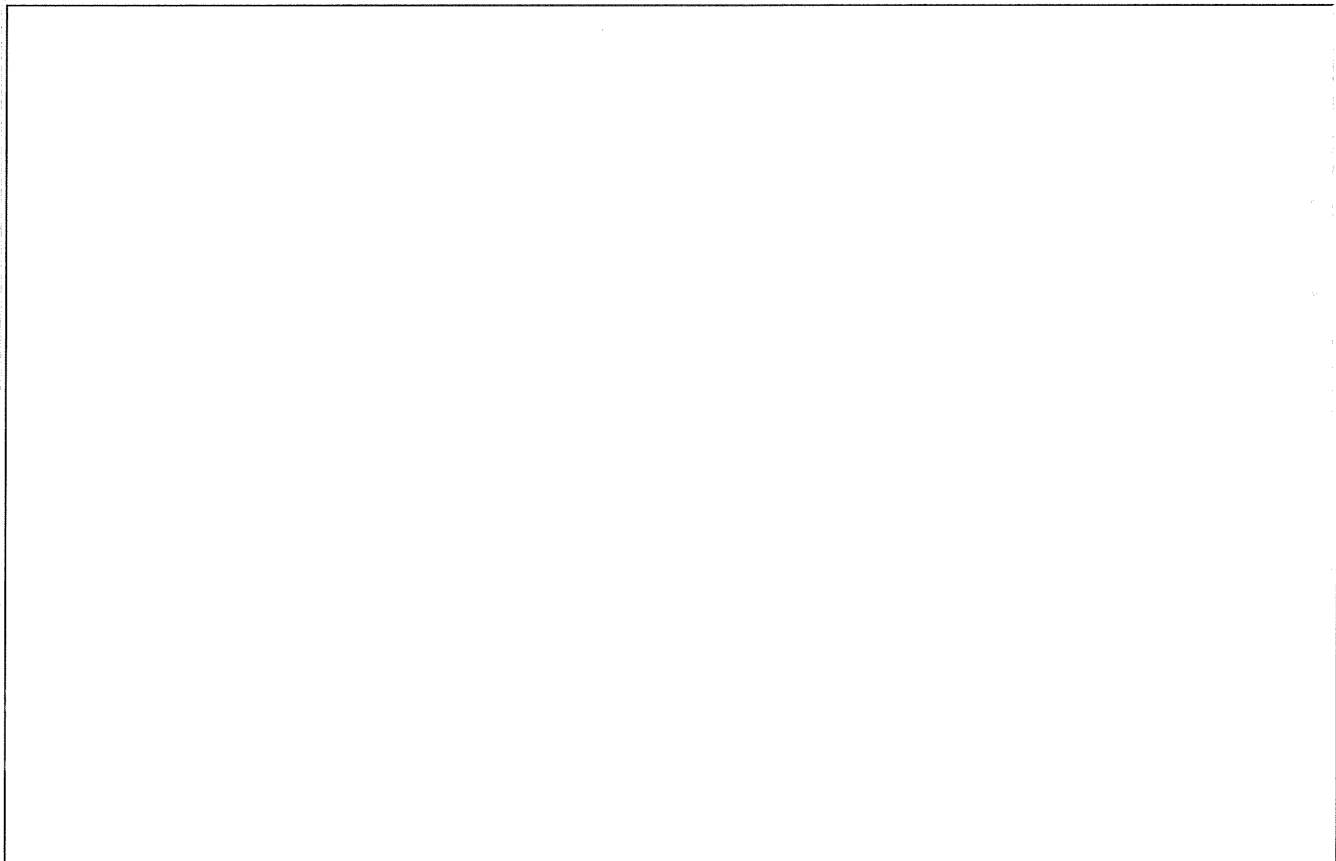
Pipe Type America
Contact Hiller New England Fire Protection, Inc.
Date 8/7/11
Units US
Altitude 0'
Designed with Hole Sizes 0,5/64"

Detector : VLP

Type VESDA VLP
Endcap Usage Create a Balanced Design
Application Default
Aspirator Speed 3990rpm
Temperature 68.0 °F
Absolute Pressure 1013.5hPa
System Flowrate 83.5l/min
Manifold Pressure 211Pa
Total Pipe Length 239' 3"
Number Of Sample Points 36
Maximum Transport Time 53
Minimum Hole Flow Rate 1.0l/min
Inverted Detector No
Fire Threshold 0.062%/ft

Balance Data

Group name	Aggregate Sensitivity	Balance	Suction pressure (least)	Endcap Sensitivity Factor
[Default Group]	0.062%/ft	76%	157Pa	0.0



Pipe:Subfloor Sampling

Total Pipe Length 86' 6"
 Ambient Pressure 0Pa
 Sector Pressure 211Pa
 Number Of Sample Points 8
 Pipe Flowrate 18.9l/min

To Tee

Pipe Diameter 0.874in

#	-	Distance ft	Relative ft	Direction	Hole Diameter in	Capillary Length ft	Transport Time sec	Pressure Pa	Flow l/min	Flow %	Hole Sensitivity %/ft	Diameter in	Capillary Diameter in	Intersection Pressure Pa
-	Elbow	1' 9"	1' 9"	L	-	-	-	-	-	-	-	-	-	-
-	Elbow	2' 3"	6"	D	-	-	-	-	-	-	-	-	-	-
-	Elbow	10' 9"	8' 6"	F	-	-	-	-	-	-	-	-	-	-
-	Tee	12'	1' 3"	L	-	-	-	-	-	-	-	-	-	-

Upper Sampling

Pipe Diameter 0.874in

#	-	Distance ft	Relative ft	Direction	Hole Diameter in	Capillary Length ft	Transport Time sec	Pressure Pa	Flow l/min	Flow %	Hole Sensitivity %/ft	Diameter in	Capillary Diameter in	Intersection Pressure Pa
1	Hole	13' 3"	1' 3"	-	5/64"	-	6	201	2.4	2.9	2.159	0.874	-	-
-	Elbow	13' 9"	6"	F	-	-	-	-	-	-	-	-	-	-
-	Elbow	23' 9"	10'	R	-	-	-	-	-	-	-	-	-	-
2	Hole	24' 3"	6"	-	5/64"	-	12	199	2.4	2.9	2.172	0.874	-	-
3	Hole	35'	10' 9"	-	5/64"	-	19	197	2.4	2.8	2.182	0.874	-	-
4	Hole	45' 9"	10' 9"	-	5/64"	-	30	196	2.4	2.8	2.189	0.874	-	-
5	Endcap	56'	10' 3"	-	5/64"	-	53	195	2.3	2.7	2.267	0.874	-	-

Lower Sampling

Pipe Diameter 0.874in

#	-	Distance ft	Relative ft	Direction	Hole Diameter in	Capillary Length ft	Transport Time sec	Pressure Pa	Flow l/min	Flow %	Hole Sensitivity %/ft	Diameter in	Capillary Diameter in	Intersection Pressure Pa
6	Hole	21' 6"	9' 6"	-	5/64"	-	12	200	2.4	2.9	2.165	0.874	-	-
7	Hole	32' 3"	10' 9"	-	5/64"	-	23	199	2.4	2.9	2.172	0.874	-	-
8	Endcap	42' 6"	10' 3"	-	5/64"	-	45	198	2.3	2.8	2.250	0.874	-	-



21	Hole	55' 11"	10"	-	5/64"	-	17	157	2.1	2.5	2.444	0.874	-	-
22	Endcap	56' 5"	6"	-	0	-	-	-	-	-	-	0.874	-	-

Pipe:To CRAC Units

Total Pipe Length 68' 11"
 Ambient Pressure 0Pa
 Sector Pressure 211Pa
 Number Of Sample Points 20
 Pipe Flowrate 42.5/min

To Tee

Pipe Diameter 0.874in

#	-	Distance ft	Relative ft	Direction	Hole Diameter in	Capillary Length ft	Transport Time sec	Pressure Pa	Flow l/min	Flow %	Hole Sensitivity %/ft	Diameter in	Capillary Diameter in	Intersection Pressure Pa
-	Elbow	3' 9"	3' 9"	F	-	-	-	-	-	-	-	-	-	-
-	Elbow	4' 7"	10"	R	-	-	-	-	-	-	-	-	-	-
-	Elbow	35' 5"	30' 10"	F	-	-	-	-	-	-	-	-	-	-
-	Elbow	40' 5"	5'	R	-	-	-	-	-	-	-	-	-	-
-	Tee	43' 11"	3' 6"	F	-	-	-	-	-	-	-	-	-	-

To CRAC Unit 2A

Pipe Diameter 0.874in

#	-	Distance ft	Relative ft	Direction	Hole Diameter in	Capillary Length ft	Transport Time sec	Pressure Pa	Flow l/min	Flow %	Hole Sensitivity %/ft	Diameter in	Capillary Diameter in	Intersection Pressure Pa
-	Elbow	44' 2"	3"	D	-	-	-	-	-	-	-	-	-	-
-	Elbow	46' 2"	2'	L	-	-	-	-	-	-	-	-	-	-
-	Elbow	47' 11"	1' 9"	F	-	-	-	-	-	-	-	-	-	-
1	Hole	48' 5"	6"	-	5/64"	-	9	160	2.1	2.6	2.419	0.874	-	-
2	Hole	49' 3"	10"	-	5/64"	-	10	160	2.1	2.6	2.423	0.874	-	-
3	Hole	50' 1"	10"	-	5/64"	-	10	159	2.1	2.6	2.426	0.874	-	-
4	Hole	50' 11"	10"	-	5/64"	-	10	159	2.1	2.6	2.429	0.874	-	-
5	Hole	51' 9"	10"	-	5/64"	-	11	158	2.1	2.5	2.432	0.874	-	-
6	Hole	52' 7"	10"	-	5/64"	-	11	158	2.1	2.5	2.435	0.874	-	-
7	Hole	53' 5"	10"	-	5/64"	-	12	158	2.1	2.5	2.438	0.874	-	-
8	Hole	54' 3"	10"	-	5/64"	-	13	157	2.1	2.5	2.440	0.874	-	-
9	Hole	55' 1"	10"	-	5/64"	-	14	157	2.1	2.5	2.442	0.874	-	-
10	Hole	55' 11"	10"	-	5/64"	-	17	157	2.1	2.5	2.444	0.874	-	-
11	Endcap	56' 5"	6"	-	0	-	-	-	-	-	-	0.874	-	-

To CRAC Unit 1A

Pipe Diameter 0.874in

#	-	Distance ft	Relative ft	Direction	Hole Diameter in	Capillary Length ft	Transport Time sec	Pressure Pa	Flow l/min	Flow %	Hole Sensitivity %/ft	Diameter in	Capillary Diameter in	Intersection Pressure Pa
-	Elbow	44' 2"	3"	D	-	-	-	-	-	-	-	-	-	-
-	Elbow	46' 2"	2'	L	-	-	-	-	-	-	-	-	-	-
-	Elbow	47' 11"	1' 9"	B	-	-	-	-	-	-	-	-	-	-
12	Hole	48' 5"	6"	-	5/64"	-	9	160	2.1	2.6	2.419	0.874	-	-
13	Hole	49' 3"	10"	-	5/64"	-	10	160	2.1	2.6	2.423	0.874	-	-
14	Hole	50' 1"	10"	-	5/64"	-	10	159	2.1	2.6	2.426	0.874	-	-
15	Hole	50' 11"	10"	-	5/64"	-	10	159	2.1	2.6	2.429	0.874	-	-
16	Hole	51' 9"	10"	-	5/64"	-	11	158	2.1	2.5	2.432	0.874	-	-
17	Hole	52' 7"	10"	-	5/64"	-	11	158	2.1	2.5	2.435	0.874	-	-
18	Hole	53' 5"	10"	-	5/64"	-	12	158	2.1	2.5	2.438	0.874	-	-
19	Hole	54' 3"	10"	-	5/64"	-	13	157	2.1	2.5	2.440	0.874	-	-
20	Hole	55' 1"	10"	-	5/64"	-	14	157	2.1	2.5	2.442	0.874	-	-

Pipe:Ceiling Sampling

Total Pipe Length 83' 10"
 Ambient Pressure 0Pa
 Sector Pressure 211Pa
 Number Of Sample Points 8
 Pipe Flowrate 22.1l/min

To Tee

Pipe Diameter 0.874in

#	-	Distance ft	Relative ft	Direction	Hole Diameter in	Capillary Length ft	Transport Time sec	Pressure Pa	Flow l/min	Flow %	Hole Sensitivity %/ft	Diameter in	Capillary Diameter in	Intersection Pressure Pa
-	Elbow	3' 9"	3' 9"	F	-	-	-	-	-	-	-	-	-	-
-	Tee	5' 3"	1' 6"	R	-	-	-	-	-	-	-	-	-	-

Lower Branch

Pipe Diameter 0.874in

#	-	Distance ft	Relative ft	Direction	Hole Diameter in	Capillary Length ft	Transport Time sec	Pressure Pa	Flow l/min	Flow %	Hole Sensitivity %/ft	Diameter in	Capillary Diameter in	Intersection Pressure Pa
1	Capillary	14' 6"	9' 3"	-	5/64"	6'	10	194	2.8	3.3	1.862	0.874	0.375	202
2	Capillary	24' 6"	10'	-	5/64"	6'	19	192	2.8	3.3	1.870	0.874	0.375	200
3	Capillary	34' 6"	10'	-	5/64"	6'	36	191	2.8	3.3	1.875	0.874	0.375	199
4	Endcap	35'	6"	-	0	-	-	-	-	-	-	0.874	-	-

Upper Branch

Pipe Diameter 0.874in

#	-	Distance ft	Relative ft	Direction	Hole Diameter in	Capillary Length ft	Transport Time sec	Pressure Pa	Flow l/min	Flow %	Hole Sensitivity %/ft	Diameter in	Capillary Diameter in	Intersection Pressure Pa
5	Capillary	8' 1"	2' 10"	-	5/64"	6'	5	195	2.8	3.3	1.859	0.874	0.375	202
-	Elbow	9' 1"	1'	F	-	-	-	-	-	-	-	-	-	-
-	Elbow	20' 7"	11' 6"	R	-	-	-	-	-	-	-	-	-	-
6	Capillary	21' 7"	1'	-	5/64"	6'	12	191	2.8	3.3	1.874	0.874	0.375	199
7	Capillary	33' 7"	12'	-	5/64"	6'	19	189	2.7	3.3	1.885	0.874	0.375	197
8	Capillary	47' 7"	14'	-	5/64"	6'	31	187	2.7	3.3	1.894	0.874	0.375	195
9	Capillary	53' 7"	6'	-	5/64"	6'	42	186	2.7	3.3	1.899	0.874	0.375	194
10	Endcap	54' 1"	6"	-	0	-	-	-	-	-	-	0.874	-	-



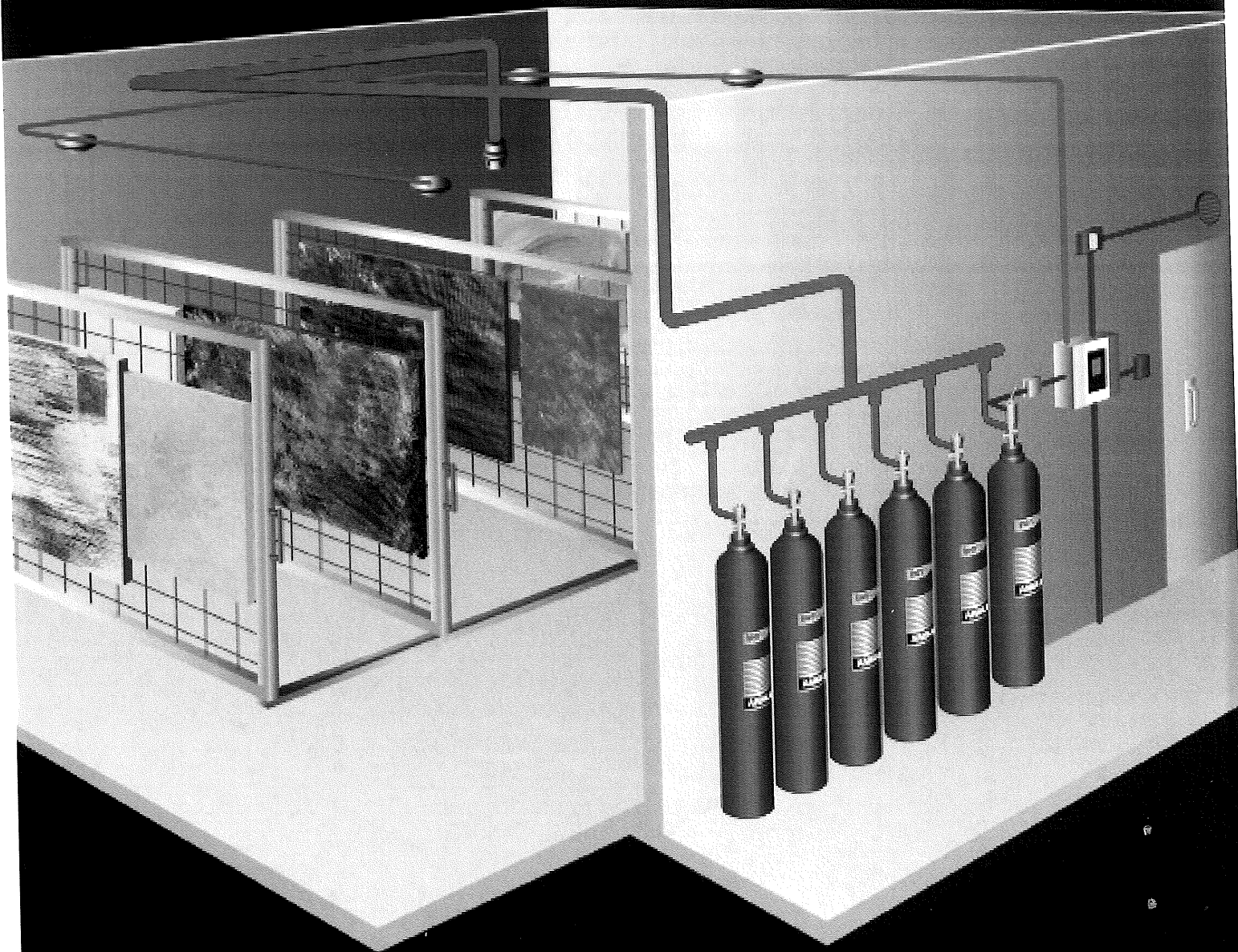
Inergen[®]
Clean Agent fire suppression systems

PRICELESS PROTECTION

INERGEN[®] Clean Agent Fire Suppression Systems

ANSUL[®]

Innovative Fire Solutions



DETECT-SUPPRESS-PROTECT
THE INERGEN CLEAN AGENT SYSTEM
FROM ANSUL

INERGEN IS BETTER FOR YOUR PROPERTY

Upon discharge, INERGEN instantly floods the room, remaining suspended to suppress fires quickly and effectively. An inert gas mixture, INERGEN is absolutely free of residues and corrosive by-products that may produce further property damage. In performance testing, INERGEN easily exceeded the NFPA Standard 2001 allowance of one-minute discharge, with documented extinguishments of 22 seconds for a Class A fire and 17 seconds for a Class B fire.

Reliable and field proven, INERGEN delivers the performance you would expect from the world leader in fire suppression.

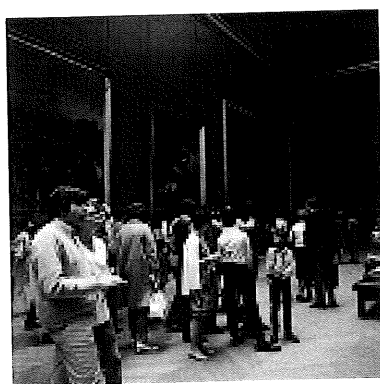
BETTER FOR YOUR PEOPLE

One of the most remarkable aspects of INERGEN is that it is safe for people. Unlike halocarbon (chemical) alternatives, which can create dangerous levels of hydrogen fluoride when in the presence of fire, INERGEN is entirely nontoxic, producing no corrosive decomposition products whatsoever. Plus, because INERGEN will not produce a fog when discharged, escape routes remain visible.

With INERGEN, the oxygen level is reduced enough to put out the flames, yet more than enough remains to breathe. In fact, those who breathe normally around INERGEN in extinguishing concentrations receive the same amount of oxygen to the brain as they would in an ordinary atmosphere, vital in cases where immediate evacuation may not be possible.

BETTER FOR THE ENVIRONMENT

The production of Halon 1301 was banned in 1993, a direct result of its negative effects on the ozone layer. We engineered INERGEN to be environmentally kind from the very start. INERGEN is non-synthetic, made exclusively of gases we already breathe: nitrogen, argon, and carbon dioxide. Once discharged, it simply returns to the atmosphere in its natural state. And because it poses no ozone depletion or global warming potential, INERGEN will never be subject to future legislative bans.



STATE-OF-THE-ART DETECTION AND CONTROL

INERGEN systems combine exclusive AUTOPULSE® microprocessor units with highly sensitive smoke, heat and flame detectors, and specialized agent distribution components, designed to detect and suppress a fire even before it reaches the flame stage. The AUTOPULSE units also perform other key functions in case of fire, including sounding alarms, closing doors, and shutting down equipment. In conjunction with manual pull stations, the system provides automatic detection, day and night.

FLEXIBILITY IS ALREADY BUILT IN

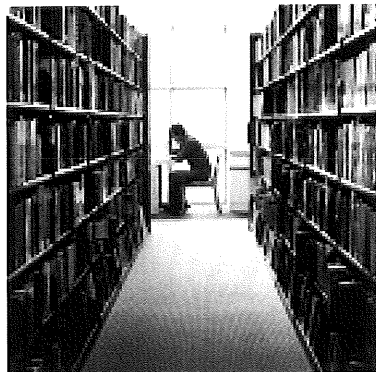
INERGEN agent is stored as a gaseous mixture in DOT-approved steel cylinders filled to nominal capacities of 200 to 435 cu. ft. (5.7 to 12.3 cu. m). Available in four sizes, you can choose to install your cylinders either vertically or horizontally, allowing for a design that requires the fewest number of cylinders and the lowest cost. You then have a choice of setting up your cylinders to open electrically, pneumatically or manually, depending on your need.

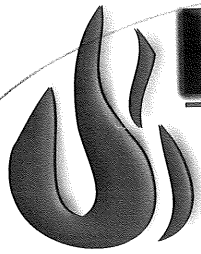
MAKE ANSUL YOUR FIRE PROTECTION PARTNER THROUGHOUT YOUR BUSINESS

From INERGEN automatic detection and suppression systems to a full range of wheeled and portable extinguishers and more, no other fire suppression brand promises the full range of solutions or the quality of ANSUL. And we back all of our products with a worldwide network of factory-trained distributors — the largest and best qualified in the industry.

APPLICATIONS THAT BENEFIT FROM INERGEN SUPPRESSION SYSTEMS:

- **AUTOMATED TAPE STORAGE LIBRARIES**
- **COMPUTER AND DATA PROCESSING FACILITIES**
- **CULTURAL AND HISTORICAL SITES**
- **HOSPITAL AND MAJOR MEDICAL FACILITIES**
- **MARINE/OFFSHORE/NAVAL**
- **MUSEUMS AND ART GALLERIES**
- **POWER GENERATION FACILITIES**
- **TELECOMMUNICATION FACILITIES**





Hiller

New England
Fire Protection, Inc.

240 BALLARDVALE ST.
WILMINGTON, MA 01887
(978) 657-5550

mail

TRANSMITTAL SHEET

TO: Building Inspections Department FROM: Eddie Cook
ADDRESS: 389 Congress St., Room 315 DATE: 9/26/2011
Portland, ME 04101
RE: Modification to the 2nd Floor Computer Room's Inergen Fire Suppression Detection/Control System at the University of Southern Maine 70 Falmouth St. Portland, ME 04104 JOB NUMBER: NE2471

ENCLOSED DRAWINGS EQUIPMENT CUTS COMPACT DISC FOR YOUR USE

NOTES/COMMENTS:

Please find the following documents for the above mentioned project:

- 1 set of blue print drawings
- 1 set of Inergen calculations
- 1 set of Vesda calculations
- 1 set of Equipment Cut Sheets
- 1 compact disc containing pdf's of all of the above
- 1 application for permit of a Non-Water-based extinguishing agent
- Check for \$230 for permit

RECEIVED

SEP 29 2011

Dept. of Building Inspections
City of Portland Maine

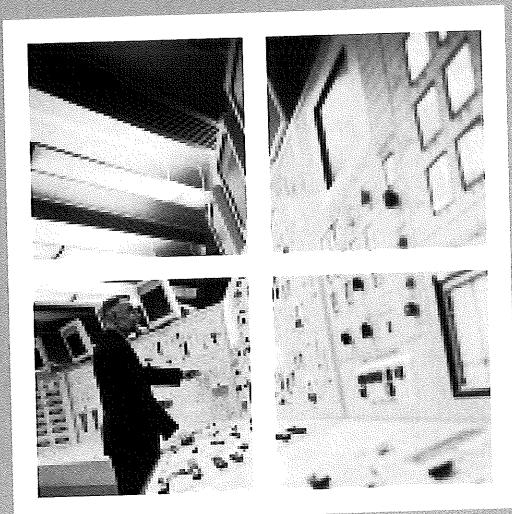
Please find the above mentioned documents pertaining to the 2nd floor Computer Room renovations at the Portland campus of the University of Southern Maine.

The Computer Room is currently being protected by an existing Inergen Fire Suppression system. The room is getting bigger. The far right wall is moving to the right approximately 4'-0". An additional Inergen cylinder will be added to the existing manifold to compensate for the added volume, helping the system maintain its compliance with NFPA 2001, year 2008. Nozzles will be relocated to help maintain an even distribution of agent. A door is being removed and the associated electric release and abort station will be removed. The A/V devices located at the removed door location will be relocated. A maintenance disconnect switch will be added and the existing obsolete smoke detection system will be replaced with a state of the art Vesda Smoke Detection System. Should you have any questions regarding this project, please don't hesitate in contacting me at the above phone number or email me at eddiecook@hillerne.com. Thank you,

Eddie Cook

EVEN AFTER THE FIRE, YOU'RE UP AND RUNNING

In minutes, fire and the attempts to put it out can destroy the equipment that keeps your operation in action. And yet, without the right defenses in place — those that protect people, property and the environment — many businesses are putting themselves at needless risk every day. Others, however, have an INERGEN® system at the ready.



Created as an ozone-safe replacement for Halon 1301, INERGEN is the nucleus of ANSUL's contemporary approach to fire protection: protect lives, protect property and protect the environment.

Clean, non-conductive INERGEN is a natural fire suppression agent particularly suited to areas where damage from conventional agents cannot be tolerated, such as sensitive data storage, information processing and systems operation electronics. In addition, many archival organizations use INERGEN to protect valuable, irreplaceable items such as artwork, historic documents and antiques.

**NO OZONE DEPLETION, GLOBAL WARMING POTENTIAL OR ATMOSPHERIC LIFETIME
ENTIRELY INERT ■ SAFE FOR SENSITIVE ELECTRONICS AND IRREPLACEABLE ITEMS
ALL-NATURAL ■ UL/ULC, FM, USCG AND MANY INTERNATIONAL APPROVALS/LISTINGS
EVERGREEN DISCHARGE WARRANTY ■ ENVIRONMENTAL WARRANTY**

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1. Identification of the preparation

Product Name: "INERGEN"
Chemical Name: N/A – This is a mixture/preparation.
CAS No.: N/A – This is a mixture/preparation.
Chemical Formula: N/A – This is a mixture/preparation.
EINECS Number: N/A – This is a mixture/preparation.

1.2. Use of the preparation

The intended or recommended use of this preparation is to discharge a FIRE EXTINGUISHING AGENT.

1.3. Company identification

Manufacturer/Supplier: ANSUL INCORPORATED
Address: One Stanton Street, Marinette, WI 54143-2542
Prepared by: Safety and Health Department
Phone: 715-735-7411
Internet/Home Page: <http://www.ansul.com>
Date of Issue: September, 2004

1.4. Emergency telephone

CHEMTREC 800-424-9300 or 703-527-3887

2. COMPOSITION/INFORMATION ON INGREDIENTS

2.1. Ingredient Name: Nitrogen.
Chemical Formula: N₂.
CAS No.: 7727-37-9.
EINECS Number: 231-783-9.
Concentration, Wt %: 42.5 %
Hazard Identification: See Heading 3.

Ingredient Name: Argon.
Chemical Formula: Ar.
CAS No.: 7440-37-1.
EINECS Number: 231-147-0.
Concentration, Wt %: 47 %.
Hazard Identification: See Heading 3.

Ingredient Name: Carbon Dioxide.
Chemical Formula: CO₂.
CAS No.: 124-38-9.
EINECS Number: 204-696-9.
Concentration, Wt %: 10.5 %.
Hazard Identification: See Heading 3.

3. HAZARDS IDENTIFICATION

FOR HUMANS:

Product: Nonflammable Gas.
EU Classification: None.
R Phrases: Keep container in a well ventilated place.
S Phrases: 9

Limit Values for Exposure:

Nitrogen: None established.
Argon: None established.
Carbon Dioxide: OSHA PEL: 5,000 ppm.
ACGIH TLV-TWA: 5,000 ppm.
ACGIH TLV-STEL: 30,000 ppm.
IDLH (Immediately Dangerous for Life and Health): 50,000 ppm.

Neither this preparation nor the substances contained in it have been listed as carcinogenic by National Toxicology

Program, IARC, or OSHA.

SIGNS AND SYMPTOMS:

Acute Exposure:

Eye Contact: Non-irritating gas.

Skin Contact: Non-irritating gas.

Inhalation: Vapor is heavier than air and can cause suffocation by reducing oxygen available for breathing. Breathing very high concentrations of vapor can cause lightheadedness, giddiness, shortness of breath, muscular tremors, and weakness, acrocyanosis. Also unconsciousness or even death.

Ingestion: Non-irritating gas. Not a likely route of entry.

Chronic Overexposure: No data available.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None known.

FOR ENVIRONMENT:

Carbon dioxide is a global warming gas.

4. FIRST AID MEASURES

- Eye Contact: Immediately flush eyes with water for a minimum of 15 minutes. If redness, itching or a burning sensation develops, get medical attention. Treat for frostbite if necessary.
- Skin Contact: If redness, itching or a burning sensation develops, get medical attention. Treat for frostbite if necessary.
- Inhalation: Remove victim to fresh air. If cough or other respiratory symptoms occur, consult medical personnel. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Consult medical personnel.
- Ingestion: None needed.

5. FIRE-FIGHTING MEASURES

Non-flammable gas. Use agent appropriate to surrounding material.

Though gas cylinders are equipped with pressure and temperature relief devices, they should be removed from high temperature areas or fires, if safe to do so, to avoid risk of rupture.

There are NO extinguishing media which must not be used for safety reasons.

NO special protective equipment is needed for fire-fighters. Wear protective equipment appropriate for the fire conditions.

6. ACCIDENTAL RELEASE MEASURES

For personal protection: Prevent direct skin and eye contact, see Heading 8.

Clean up: This substance will vaporize into the atmosphere, see Heading 13.

Carbon dioxide is a global warming gas.

7. HANDLING AND STORAGE

7.1. Handling

Care should be taken in handling all chemical substances and preparations.

Secure to prevent falling. Do not move without safety cap in place to prevent damage to valve.

See incompatibility information in Heading 10.

7.2. Storage

Store cylinders with restraints to prevent possibility of rupture. Store as a compressed gas in DOT-approved vessels. Keep safety cap in place while in storage.

See incompatibility information in Heading 10.

Store in original container. Keep tightly closed until used.

Carbon Dioxide is a global warming gas.

7.3. Specific use

The intended or recommended use of this preparation is to discharge a FIRE EXTINGUISHING AGENT.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure limit values

Limit Values for Exposure:

Nitrogen:	None established.
Argon:	None established.
Carbon dioxide:	OSHA PEL: 5,000 ppm, (9,000 mg/m ³).
	ACGIH TLV-TWA: 5,000 ppm, (9,000 mg/m ³).
	ACGIH TLV-STEL: 30,000 ppm, (54,000 mg/m ³).
	IDLH (Immediately Dangerous for Life and Health): 50,000 ppm.

8.2. Exposure controls

8.2.1. Occupational exposure controls

8.2.1.1. Respiratory protection

Exposure to high concentrations requires the use of self-contained breathing apparatus. Other respirators will not protect in an oxygen deficient atmosphere.

8.2.1.2. Hand protection

Use leather gloves when handling cylinders.

8.2.1.3. Eye protection

Use safety glasses with side shields or safety goggles.

8.2.1.4. Skin protection

No special equipment is needed.

8.2.2. Environmental exposure controls

None needed. The components of this product are normal atmospheric gases.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. General information

Appearance:	Colorless gas.
Odor:	None.

9.2. Important health, safety, and environmental information

pH:	7 (at 25 °C).
Boiling point/boiling range:	-320 °C.
Flash point:	None to boiling.
Flammability (solid/gas):	Not flammable.
Explosive properties:	Not explosive.
Oxidizing properties:	Not an oxidizer.
Vapor Pressure:	2205 psi @ 70 °F. (21.1 °C)
Relative Density (Water = 1):	0.084 lbs/ft ³ .
Solubility:	
- Water solubility:	Carbon dioxide: 88 ml per 100 ml @ 20 °C. Nitrogen: Insoluble. Argon: Insoluble.
- Fat solubility:	Not soluble.
Partition coefficient, n-octanol/water:	Not determined.
Viscosity:	Not determined.
Vapor density (Air = 1):	1.0.
Evaporation rate (Butyl acetate = 1):	< 1, water only evaporates.

9.3. Other information

Auto-ignition temperature:	Does not ignite.
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10. STABILITY AND REACTIVITY

10.1. Conditions to avoid

Extremely high temperatures, as in a fire may cause a cylinder to fail.
There are NO known conditions such as temperature, pressure, light, shock, etc., which may cause a dangerous reaction.

10.2. Materials to avoid

Because of Carbon Dioxide: (Al + Na₂O₂), (Mg + Na₂O), Cs₂O, Li, K, Mg(C₂H₅)₂, KC₂H, Na, NaK, and Ti.

10.3. Hazardous decomposition products

Normally stable.
Hazardous polymerization will NOT occur.
There are no hazardous combustion or decomposition products.

11. TOXICOLOGICAL INFORMATION

Carbon dioxide:

Inhalation LC₅₀ (human) = 100,000 ppm/min.

Can cause suffocation by reducing oxygen available for breathing. Breathing very high concentrations of vapor can cause dizziness, shortness of breath, unconsciousness, or even death.

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity

This preparation consists of normal atmospheric gases.

12.2. Mobility

This preparation consists of normal atmospheric gases.

12.3. Persistence and degradability

This preparation consists of normal atmospheric gases.

12.4. Bioaccumulative potential

This preparation consists of normal atmospheric gases.

12.5. Other adverse effects

Ozone depletion potential:	None.
Photochemical ozone creation potential:	None.
Global warming potential:	Carbon dioxide is a global warming gas.

13. DISPOSAL CONSIDERATIONS

Carbon dioxide is a global warming gas.
This preparation consists of normal atmospheric gases.

14. TRANSPORT INFORMATION

Hazard Class or Division: Compressed Gas N.O.S. (Mixture of compressed nitrogen, argon, and carbon dioxide),
Class 2.2, UN1956.

Label: Nonflammable gas.

Emergency response guide page number: 126; EMS (Intl): 2-04.

For additional transport information, contact Ansul Incorporated.

Carbon dioxide is a global warming gas.

15. REGULATORY INFORMATION

EU Classification:	Nonflammable gas.
R Phrases:	None.
S Phrases: 9	Keep container in a well ventilated place.
Exposure Limit Values:	
Nitrogen:	None established.
Argon:	None established.
Carbon dioxide:	OSHA PEL: 5,000 ppm, (9,000 mg/m ³).
	ACGIH TLV-TWA: 5,000 ppm, (9,000 mg/m ³).
	ACGIH TLV-STEL: 30,000 ppm, (54,000 mg/m ³).
	IDLH (Immediately Dangerous for Life and Health): 50,000 ppm.
EINECS Status:	All components are included in EINECS inventories or are exempt from listing.
EPA TSCA Status:	All components are included in TSCA inventories or are exempt from listing.
Canadian DSL (Domestic Substances List):	All components are included in the DSL or are exempt from listing.
Environmental restrictions:	None are known.
Restrictions on Marketing and Use:	None are known.
	Refer to any other national measures that may be relevant.

16. OTHER INFORMATION**(HMIS) HAZARDOUS MATERIAL IDENTIFICATION SYSTEM RATINGS:**

HEALTH:	<u>1</u>	4. Severe Hazard
FLAMMABILITY:	<u>0</u>	3. Serious Hazard
REACTIVITY:	<u>0</u>	2. Moderate Hazard
		1. Slight Hazard
		0. Minimal Hazard

(WHMIS) CANADIAN WORKPLACE HAZARDOUS MATERIAL IDENTIFICATION SYSTEM RATINGS:

This product is rated: **A Compressed Gas.**

Format is from directive 2001/58/EC.

EINECS data is from <http://ecb.jrc.it/existing-chemicals/>

Data used to compile the data sheet is from Ansul Material Safety Data Sheet, February, 2002.

Toxicological information added from the EINECS ESIS (Existing Substances Information System).

A rating under WHMIS has been added, following the Canadian guidelines.

17. DISCLAIMER

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT, BUT DOES NOT PURPORT TO BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. ANSUL SHALL NOT BE HELD LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT.

MSDS available at <http://www.ansul.com>

INERGEN® FIRE SUPPRESSION SYSTEMS DATA SHEET

150 BAR SYSTEM SPECIFICATIONS

PRODUCT NAME

INERGEN® Fire Suppression System

ENVIRONMENTAL IMPACT

INERGEN agent is a mixture of three naturally occurring gases: nitrogen, argon, and carbon dioxide. As INERGEN agent is derived from gases present in the earth's atmosphere, it exhibits no ozone depleting potential, does not contribute to global warming, nor does it contribute unique chemical species with extended atmospheric lifetimes. Because INERGEN agent is composed of atmospheric gases, it does not pose the problems of toxicity associated with the chemically derived Halon alternative agents.

PRODUCT DESCRIPTION

The INERGEN Fire Suppression System, manufactured by Ansul, is an engineered system utilizing a fixed nozzle agent distribution network. The system is designed and installed in accordance with the National Fire Protection Association (NFPA) Standard 2001, "Clean Agent Fire Extinguishing Systems." When properly designed, the INERGEN system will extinguish surface burning fire in Class A, B, and C hazards by lowering the oxygen content below the level that supports combustion.

INERGEN agent has also been tested by FMRC for inerting capabilities. Those tests have shown that INERGEN agent, at design concentrations between 40% and 50%, has successfully inerted mixtures of propane/air, and methane/air.

The system can be actuated by detection and control equipment for automatic system operation along with providing local and remote manual operation as needed. Accessories are used to provide alarms, ventilation control, door closures, or other auxiliary shutdown or functions.

When INERGEN agent is discharged into a room, it introduces the proper mixture of gases that will allow a person to breathe in a reduced oxygen atmosphere.

A system installation and maintenance manual is available containing information on system components and procedures concerning design, operation, inspection, maintenance, and recharge.

The system is installed and serviced by authorized distributors that are trained by the manufacturer.

Basic Use – The INERGEN system is particularly useful for suppressing fires in hazards where an electrically non-conductive medium is essential or desirable; where clean-up of other agents present a problem; or where the

hazard is normally occupied and requires a non-toxic agent.

The following are typical hazards protected by INERGEN systems:

- Computer rooms
- Subfloors
- Tape storage
- Telecommunication/Switchgear
- Vaults
- Process equipment
- All normally occupied or unoccupied electronic areas where equipment is either very sensitive or irreplaceable

Composition and Materials – The basic system consists of extinguishing agent stored in high strength alloy steel cylinders. Various types of actuators, either manual or automatic, are available for release of the agent into the hazard area. The agent is distributed and discharged into the hazard area through a network of piping and nozzles. Each nozzle is drilled with a fixed orifice designed to deliver a uniform discharge to the protected area. On large hazards, where three or more cylinders are required, a screwed or welded pipe manifold assembly is employed. The cylinder(s) is connected to the distribution piping or the manifold by means of a flexible discharge bend and check valve assembly.

Additional equipment includes – Control panels, releasing devices, remote manual pull stations, corner pulleys, door closures, pressure trips, bells and alarms, and pneumatic switches. All or some are required when designing a total system.

INERGEN Agent – INERGEN agent is a mixture of three inerting (oxygen diluting) gases: 52% nitrogen, 40% argon, and 8% carbon dioxide. INERGEN gas extinguishes fire by lowering the oxygen content below the level that supports combustion. When INERGEN agent is discharged into a room, it introduces the proper mixture of gases that still allow a person to breathe in a reduced oxygen atmosphere. It actually enhances the body's ability to assimilate oxygen. The normal atmosphere in a room contains 21% oxygen and less than 1% carbon dioxide. If the oxygen content is reduced below 15%, most ordinary combustibles will cease to burn. INERGEN agent will reduce the oxygen content to approximately 12.5% while increasing the carbon dioxide content to about 3%. The increase in the carbon dioxide content increases a person's respiration rate and the body's ability to absorb oxygen. Simply stated, the human body is stimulated by the carbon dioxide to breathe more deeply and rapidly to compensate for the lower oxygen content of the atmosphere.

Cylinders – The cylinders are constructed, tested, and marked in accordance with applicable Dept. of Transportation (DOT) and the U.S. Bureau of Explosives specifications. As a minimum, the cylinders must meet the requirements of DOT 3AA2300 or 3AA2015+.

Cylinder Assembly – The cylinder assembly is of steel construction with a red standard finish. Four sizes are available to meet specific needs. Each is equipped with a pressure seat-type valve equipped with gauge. The valve is constructed of forged brass and is attached to the cylinder providing a leak tight seal. The valve also includes a safety pressure relief device which provides relief at 2900-3300 psi (20685-23167 kPa) per CGA test method. Cylinder charging pressure is 2175 psi at 70 °F (14997 kPa at 21 °C). The cylinders are shipped with a maintenance record card and shipping cap attached. The cap is attached to the threaded collar on the neck of each cylinder to protect the valve while in transit. The cylinder serial number and date of manufacture are stamped near the neck of each cylinder.

Electric Actuator – Electric actuation of an agent cylinder is accomplished by an electric actuator interfaced through an AUTOPULSE® Control System. This actuator can be used in hazardous environments where the ambient temperature range is between 32 °F and 130 °F (0 °C and 54 °C). In auxiliary or override applications, a manual lever actuator can be installed on top of the actuator.

Manual or Pneumatic Actuators – Manual/pneumatic actuators are available for lever actuation on the cylinder valve. Manual actuation is accomplished by pulling the hand lever on the actuator.

Detection System – The AUTOPULSE Control System is used where an automatic electronic control system is required to actuate the INERGEN system. This control system is used to control a single fixed fire suppression or alarm system based on inputs received from fire detection devices. The detection circuits can be configured using cross, counting, independent or priority-zone (counting) concepts. The control system has been tested to the applicable FCC Rules and Regulations for Class A Computing devices.

Nozzles – Nozzles are designed to direct the discharge of INERGEN agent using the stored pressure from the cylinders. Ten sizes of nozzles are available. The system design specifies the nozzle and orifice size to be used for proper flow rate and distribution pattern. The nozzle selection depends on the hazard and location to be protected.

Pressure Reducer – The pressure reducer is required in the distribution piping to restrict the flow of INERGEN agent, thus reducing the agent pressure down stream of the reducer. The pressure reducer contains a stainless steel orifice plate which is drilled to the specific size hole required based on the hydraulic calculation. The orifice plate provides readily visible orifice identification. The pressure reducer is available in nine sizes: 1/2 in., 3/4 in., 1 in., 1 1/4 in., 1 1/2 in., 2 in., 2 1/2 in., 3 in., and 4 in. NPT.

Pipe and Fittings – The system manifold must be constructed of Schedule 80 or 160 piping and 2000 or 3000 psi iron fittings, threaded or welded. The distribution piping down stream from the orifice union must be constructed of a minimum of Schedule 40 piping with class 300 malleable iron threaded fittings or welded steel fittings. All piping must be black iron of the following type and grade: ASTM A-53 seamless or electric resistance welded, grade A or B, or ASTM A-106 grade A, B, or C. **Do not use ASTM A-120, ASTM A-53 type F or ordinary cast iron pipe or fittings.**

Limitations – The INERGEN system must be designed and installed within the guidelines of the manufacturer's design, installation, operation, inspection, recharge, and maintenance manual. The ambient temperature limitations are 32 °F to 130 °F (–0 °C to 54 °C). All AUTOPULSE Control Systems are designed for indoor applications and for temperature ranges between 32 °F and 120 °F (0 °C and 49 °C).

TECHNICAL DATA

Applicable Standards: The INERGEN system complies with NFPA Standard 2001, Standard for Clean Agent Fire Extinguishing Systems, and EPA Program SNAP, Significant New Alternate Policy.

Agent is listed and approved by Underwriters Laboratories, Inc. (UL) and Factory Mutual Research Corporation (FMRC).

INSTALLATIONS

All system components and accessories must be installed by personnel trained by the manufacturer. All installations must be performed according to the guidelines stated in the manufacturer's design, installation, operation, inspection, recharge, and maintenance manual.

AVAILABILITY AND COST

Availability – INERGEN Systems are sold and serviced through a network of independent distributors located in most states and many foreign countries.

Cost – Cost varies with type of system specified, size, and design.

PRODUCT WARRANTY

Warranty – The components of the fire suppression system supplied by Ansul Inc. ("Ansul") are warranted to you as the original purchaser for one year from the date of delivery against defects in workmanship and material. Ansul will replace or repair any Ansul supplied components, which, in its opinion, are defective and have not been tampered with or subjected to misuse, abuse, or exposed to highly corrosive conditions provided that written notice of the alleged defect shall have been given to Ansul within 30 days after discovery thereof and prior to the expiration of one year after delivery, and further provided that if Ansul so instructs, such article or part thereof is promptly returned to Ansul with shipping charges prepaid.

Disclaimer of Warranty and Limitation of Damage

– The warranty described above is the only one given by Ansul concerning this system. **ANSUL MAKES NO OTHER WARRANTIES OF ANY KIND, WHETHER EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE. ANSUL'S MAXIMUM RESPONSIBILITY FOR ANY CLAIMS WHETHER IN CONTRACT, TORT, NEGLIGENCE, BREACH OF WARRANTY, OR STRICT LIABILITY SHALL BE LIMITED TO THE PURCHASE PRICE OF THE SYSTEM. UNDER NO CIRCUMSTANCES SHALL ANSUL BE RESPONSIBLE FOR SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES OF ANY KIND.** Ansul does not assume or authorize any other person to assume for it any additional liability in connection with the sale of this system.

For repairs, parts, and service of the Ansul fire suppression system, contact a local Ansul representative, or Ansul Incorporated, Marinette, WI 54143-2542, 800-TO-ANSUL (862-6785).

FALSE DISCHARGE WARRANTY

Subject to the conditions set forth below, Ansul will, as purchaser's sole remedy, replace INERGEN gas and pay reasonable costs to recharge the INERGEN/Detection and Control System where, in Ansul's opinion, the discharge has occurred due to a defect in the material or workmanship of the products provided by Ansul. This warranty is extended only to the original purchaser of the INERGEN/Detection and Control System and only for a period of one year from the date of installation of the INERGEN/Detection and Control System.

Ansul will only replace INERGEN gas and pay reasonable costs to recharge the INERGEN/Detection and Control System where the discharge occurs due to a defect in the material or workmanship of the products provided by Ansul. For example, Ansul will not be responsible for discharges due to faulty maintenance or installation or service, intentional acts by the owner or third parties, or circumstances over which Ansul has no control. Ansul will not be responsible for discharges of the INERGEN/Detection and Control System which occur if the INERGEN/Detection and Control System, as initially installed, has been altered or modified.

This warranty shall be effective only if the original purchaser maintains a semi-annual service agreement for the INERGEN/Detection and Control System with an Authorized Ansul Distributor from the date of installation. This warranty covers only those INERGEN/Detection and Control Systems purchased from Ansul or its Authorized Distributors and only those INERGEN/Detection and Control Systems which incorporate and use only hardware and components, including detection and control devices manufactured, sold, or approved by Ansul. This warranty may not be assigned or transferred to others.

Ansul Product Services Department must be notified within three days of the discharge of the INERGEN/Detection and Control System and must approve the cost of INERGEN gas and recharge service in advance.

Except as provided above, **ANSUL MAKES NO WARRANTIES OF ANY KIND, WHETHER EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, UNDER NO CIRCUMSTANCE SHALL ANSUL HAVE ANY LIABILITY FOR CONSEQUENTIAL, INCIDENTAL, SPECIAL OR SIMILAR DAMAGES. ANSUL SHALL HAVE NO LIABILITY FOR ANY DAMAGES DUE TO DELAY IN RECHARGING THE "INERGEN"/DETECTION AND CONTROL SYSTEM. ANSUL'S MAXIMUM LIABILITY FOR DIRECT DAMAGES IS LIMITED TO THE REPLACEMENT OF INERGEN GAS AND REASONABLE COSTS TO RECHARGE THE "INERGEN"/DETECTION AND CONTROL SYSTEM.**

This warranty is not effective unless Ansul Form No. F-9346 is completed and returned to Ansul within 10 days of the commissioning of the INERGEN/Detection and Control System.

MAINTENANCE

Maintenance is a vital step in the performance of a fire suppression system. As such, it must be performed by an authorized Ansul distributor in accordance with NFPA 2001 and the manufacturer's design, installation, recharge, and maintenance manual. When replacing components on the Ansul system, use only Ansul approved parts.

TECHNICAL SERVICES

For information on the proper design and installation, contact a local authorized INERGEN System distributor. The Ansul applications engineering department is also available to answer design and installation questions. Call 800-TO-ANSUL (862-6785).

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INERGEN® FIRE SUPPRESSION SYSTEMS DATA SHEET

EXTINGUISHING AGENT

APPLICATION

INERGEN® extinguishing agent used in Ansul engineered systems is particularly useful for hazards where an electrical, non-conductive medium is essential or desirable; where clean-up of other agents presents a problem; where hazard obstructions require the use of a gaseous agent; or where the hazard is normally occupied and requires a non-toxic agent.

The following are typical hazards protected by INERGEN systems:

- Computer rooms
- Subfloors
- Tape storage
- Telecommunications/Switchgear
- Vaults
- Process equipment
- All normally occupied or unoccupied areas where electronic equipment is either very sensitive or irreplaceable

ENVIRONMENTAL IMPACT

INERGEN agent is a mixture of three naturally occurring gases: nitrogen, argon and carbon dioxide. As INERGEN agent is derived from gases present in the earth's atmosphere, it exhibits no ozone depleting potential, does not contribute to global warming, nor does it contribute unique chemical species with extended atmospheric lifetimes. Because INERGEN agent is composed of atmospheric gases, it does not pose the problems of toxicity associated with the chemically derived Halon alternative agents.

DESCRIPTION

INERGEN agent is a plentiful, non-corrosive gas that does not support combustion nor react with most substances. INERGEN agent contains only naturally-occurring gases which have no impact on the ozone or the environment in general. INERGEN agent is a mixture of three inerting (oxygen diluting) gases: 52% nitrogen, 40% argon, and 8% carbon dioxide. INERGEN agent extinguishes fire by lowering the oxygen content below the level that supports combustion. When INERGEN agent is discharged into a room, it introduces the proper mixture of gases that still allow a

person to breathe in a reduced oxygen atmosphere. It actually enhances the body's ability to assimilate oxygen. The normal atmosphere in a room contains approximately 21% oxygen and less than 1% carbon dioxide. If the oxygen content is reduced below 15%, most ordinary combustibles will not burn. INERGEN agent will reduce the oxygen content to approximately 12.5% while increasing the carbon dioxide content to about 3%. The increase in the carbon dioxide content increases a person's respiration rate and the body's ability to absorb oxygen. Simply stated, the human body is stimulated by the carbon dioxide to breathe more deeply and rapidly to compensate for the lower oxygen content of the atmosphere.

PERFORMANCE

INERGEN is an effective fire extinguishing agent that can be used on many types of fires. INERGEN extinguishing system units are designed for total flooding protection against Class A surface burning, Class B flammable liquid, and Class C fires occurring within an enclosure by lowering the oxygen content below the level that supports combustion.

INERGEN agent has been tested by FMRC for inerting capabilities. Those tests have shown that INERGEN agent, at design concentrations between 40% and 50%, has successfully inerted mixtures of propane/air, and methane/air.

PHYSICAL PROPERTIES OF INERGEN

- Specific gravity:
0.085 lbs./cu. ft. (1.36 kg/m³)
- Vapor density:
1.1 (Air = 1)
- Approximate molecular weight:
34

APPROVAL

INERGEN agent complies with the NFPA Standard 2001, Standard for Clean Agent Fire Extinguishing Systems and EPA Program SNAP, Significant New Alternate Policy.

Agent is listed and approved by Underwriters Laboratories, Inc. (UL) and Factory Mutual Research Corporation (FMRC).

Containers meet the applicable Department of Transportation (DOT) specifications.

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System Components

UL EX-4510 6-1-02 Page 1-1.1

REV. 3



CV-98 Valve / Cylinder Shipping Assembly

Description

The cylinder is factory filled with INERGEN® agent. A single cylinder may be used or multiple cylinders can be manifolded together to obtain the required quantity of agent for total flooding. The cylinder valve can be actuated electrically, pneumatically, and/or manually with approved valve actuation components. All valves are equipped with an anti-recoil feature.

The cylinders are shipped with a maintenance record card and protective shipping cap attached to the threaded neck of each cylinder. This cap entirely encloses and protects the valve while in shipment.

The equivalent length of the valve is equal to 20 ft. (6.1 m) of 1/2 in. Sch. 40 pipe.

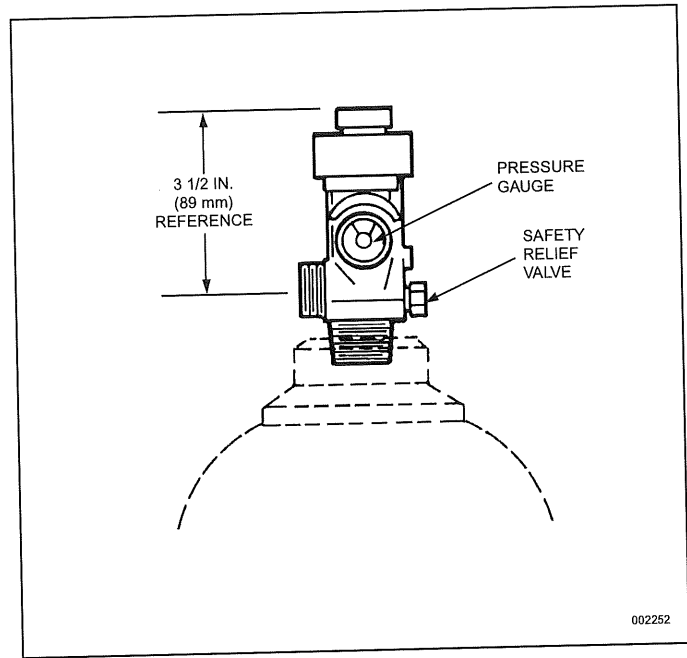
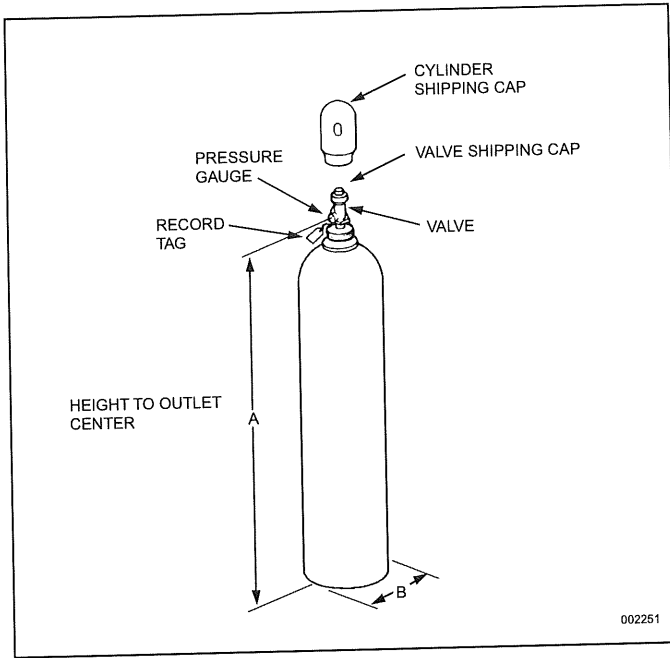
Component	Material	Approvals
Cylinder	Steel	Meets DOT 3AA2300
Valve	Brass	
Safety Relief Valve	Brass	
Valve/Cylinder Assembly		FMRC Approved UL Listed (EX-4510)
Shipping Cap	Steel	

Shipping Assembly Part No.	Nominal Cylinder Size ft.3 (m3)	Actual INERGEN Agent Quantity ft.3 m3	Approximate Weight lb. (kg)	Dimension A in. (cm)	Dimension B in. (cm)
Shipping Assemblies – Red Standard Paint					
426147	200 (5.7)	205 (5.8)	128 (58)	52.7 (129)	8.5 (21.6)
426148	250 (7.1)	266 (7.5)	169 (77)	57.7 (147)	9.3 (23.5)
426149	350 (9.9)	355 (10.1)	217 (98)	59.7 (152)	10.7 (27.3)
426620	LC-350 (9.9)	355 (10.1)	217 (98)	60.2 (152.9)	10.5 (26.7)
426594	LC-425 (12.0)	429 (12.1)	246 (111.6)	70.5 (179.1)	10.5 (26.7)
426150	435* (12.3)	439 (12.4)	260 (117.9)	66.9 (170.0)	11.0 (27.9)
Shipping Assemblies – Red Corrosion Resistant Paint					
426256	200 (5.7)	205 (5.8)	128 (58)	52.7 (129)	8.5 (21.6)
426257	250 (7.1)	266 (7.5)	169 (77)	57.7 (147)	9.3 (23.5)
426258	350 (9.9)	355 (10.1)	217 (98)	59.7 (152)	10.7 (27.3)
426621	LC-350 (9.9)	355 (10.1)	217 (98)	60.2 (152.9)	10.5 (26.7)
426595	LC-425 (12.0)	429 (12.1)	246 (111.6)	70.5 (179.1)	10.5 (26.7)
426259	435 (12.3)	439 (12.4)	260 (117.9)	66.9 (170.0)	11.0 (27.9)

* NOTE: For Shanghai version, order Part No. 430935.

Canadian TC Approved

Shipping Assembly Part No.	Nominal Cylinder Size ft.3 (m3)	Actual INERGEN Agent Quantity ft.3 m3	Approximate Weight lb. (kg)	Dimension A in. (cm)	Dimension B in. (cm)
Shipping Assemblies – Red Enamel Paint					
426712	200 (5.7)	205 (5.8)	128 (58)	52.7 (129)	8.5 (21.6)
426713	250 (7.1)	266 (7.5)	169 (77)	57.7 (147)	9.3 (23.5)
426714	350 (9.9)	355 (10.1)	217 (98)	59.7 (152)	10.7 (27.3)
427551	LC-425 (12.0)	429 (12.1)	246 (111.6)	70.5 (179.1)	10.5 (26.7)
426715	435 (12.3)	439 (12.4)	260 (117.9)	66.9 (170.0)	11.0 (27.9)
Shipping Assemblies – Red Epoxy CR Paint					
426716	200 (5.7)	205 (5.8)	128 (58)	52.7 (129)	8.5 (21.6)
426717	250 (7.1)	266 (7.5)	169 (77)	57.7 (147)	9.3 (23.5)
426718	350 (9.9)	355 (10.1)	217 (98)	59.7 (152)	10.7 (27.3)
427552	LC-425 (12.0)	429 (12.1)	246 (111.6)	70.5 (179.1)	10.5 (26.7)
426719	435 (12.3)	439 (12.4)	260 (117.9)	66.9 (170.0)	11.0 (27.9)



CV-98 INERGEN Valve

The CV-98 valve has a ten (10) year warranty. **The valve requires no internal maintenance.** The valve is sealed closed and must not be disassembled. If there is ever a malfunction of the CV-98 valve, the complete valve must be sent back to Ansul for warranty replacement. **If the external seal is broken, the warranty is voided.**

NOTE: Use Flexible Discharge Bend, Part No. 427082, when attaching valve to supply pipe or manifold.

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360° Discharge Nozzle

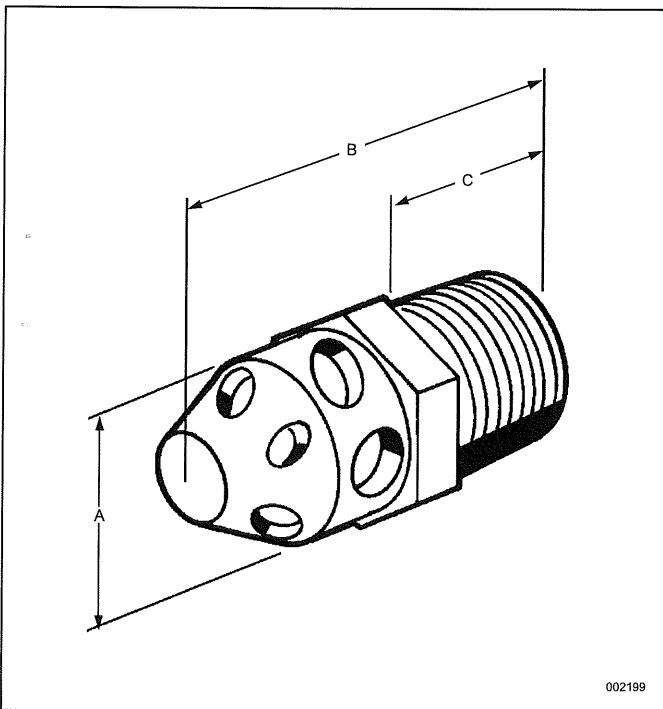
Description

Discharge nozzles are designed to direct the discharge of INERGEN® agent using the stored pressure from the cylinders. Ten sizes of nozzles are available. The system design specifies the orifice size to be used for proper flow rate and distribution pattern*. The nozzle selection depends on the hazard and location to be protected. Standard nozzles are constructed of brass.

NOTE: 2, 2 1/2, and 3 in. nozzles are not recommended in areas that are subject to damage by high velocity discharges, such as suspended ceiling tiles.

Shipping Assembly Part No.	Description
417908	1/4 in. NPT nozzle**
417723	3/8 in. NPT nozzle**
417362	1/2 in. NPT nozzle
417363	3/4 in. NPT nozzle
417364	1 in. NPT nozzle
417365	1 1/4 in. NPT nozzle
417366	1 1/2 in. NPT nozzle
426155	2 in. NPT nozzle
426156	2 1/2 in. NPT nozzle
426137	3 in. NPT nozzle

Component	Material	Thread Size	Approvals
Nozzle	Body-Brass	1/4**, 3/8**, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2, 3 NPT	FMRC Approved UL Listed (EX-4510)



Size	A-In.	B-In.	C-In.	Hex
1/4 in.	5/8	1 9/16	21/32	5/8
3/8 in.	3/4	1 5/8	23/32	3/4
1/2 in.	15/16	1 31/32	27/32	15/16
3/4 in.	1 1/8	2 5/32	7/8	1 1/8
1 in.	1 13/32	2 9/16	1	1 7/16
1 1/4 in.	1 3/4	2 3/4	1 1/16	1 3/4
1 1/2 in.	2	2 31/32	1 1/16	2
2 in.	2 3/8	3	1	2 3/8
2 1/2 in.	3	3 1/2	1	3
3 in.	3 1/2	4 1/8	1 1/4	3 1/2

- ▶ NOTE: Refer to "Nozzle/Pressure Reducer Range Chart" in
- ▶ Design Section for detailed orifice range information.

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* Orifice diameter must be specified when ordering nozzle.
Refer to Orifice Size Chart in Manual Appendix Section.

**UL/ULC listed only.

VESDA[®]
by  **xtralis**

**The World's No. 1 Brand
of Air-sampling Smoke Detector**



7 Reasons for VESDA

1

When business continuity is paramount

Is uptime a key business goal? Is service provision critical?

VESDA by Xtralis very early warning smoke detectors provide the earliest warning of a potential fire that buys time to investigate, intervene and potentially avoid business disruption in addition to the damage, downtime and cost of a suppression release. Such early warning is critical for:

- Telecommunications facilities
- Server rooms
- Financial data centers
- Utilities
- Clean rooms
- Power generation facilities

2

When smoke is difficult to detect

Is high airflow diluting smoke, preventing it from reaching the ceiling so it can be detected? Is the smoke being trapped in ducts, pockets or voids? Is smoke stratifying into a mushroom cloud below a high ceiling, making it difficult to detect?

VESDA sampling points can be placed at the return air grill or in equipment cabinets to detect smoke as it is carried by the air. In large, open spaces, sampling points for VESDA detectors can be placed where smoke goes — often some distance below ceiling level. Suitable for:

- Server rooms
- Clean rooms
- Telecommunications facilities
- Warehouses
- Atriums
- Indoor stadiums
- Theaters
- Convention centers

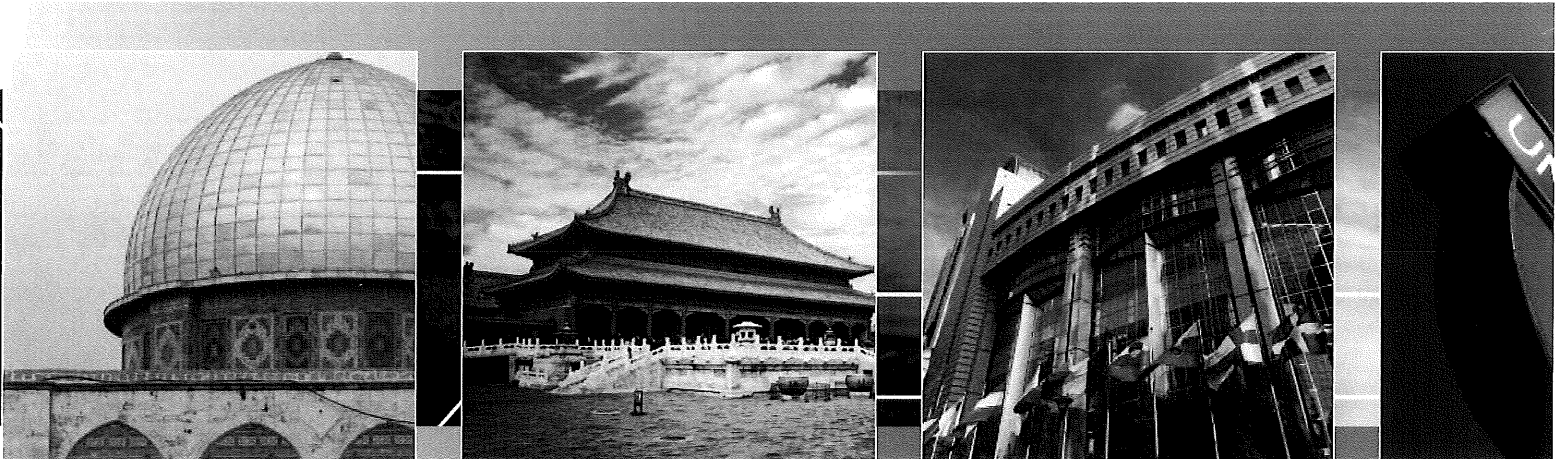
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When maintenance access is difficult

Is the area to be protected inaccessible? Does maintenance on current fire protection systems cause disruptions and inconvenience your business?

VESDA detectors can be mounted in accessible locations to enable easy maintenance. Only the sampling pipe network is placed in the inaccessible area. Ideal for:

- Ceiling voids and sub-floor spaces
- Prisons and detention facilities
- Elevator shafts
- Ducts
- Production areas

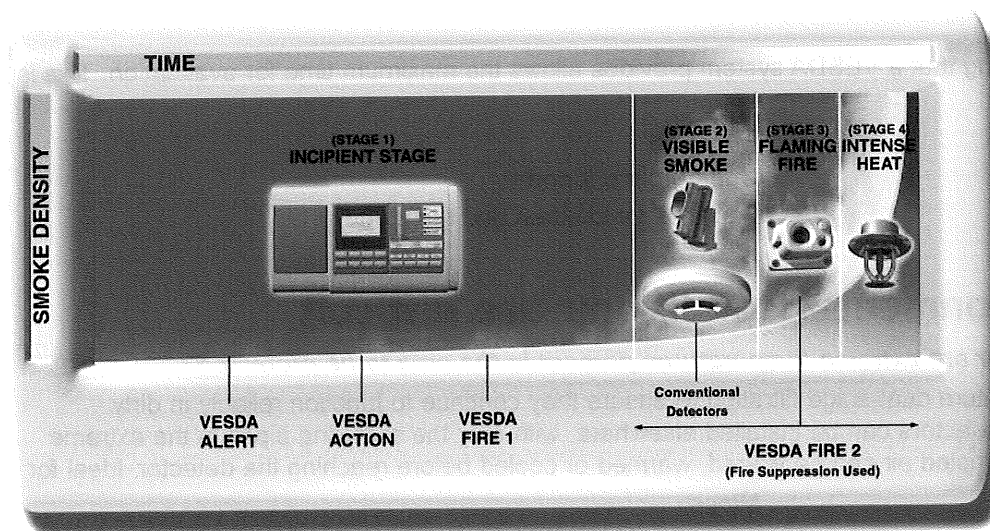


VESDA by Xtralis Air-sampling Smoke Detection (ASD)

The World's No. 1 ASD Brand

VESDA by Xtralis very early warning smoke detection solutions provide the earliest possible warning of an impending fire hazard. VESDA buys time to investigate an alarm and initiate an appropriate response to prevent injury, property damage or business disruption. And because VESDA has the industry's widest sensitivity range and multi-level warnings, even minute levels of smoke can be detected before a fire has time to escalate.

As the No. 1 ASD brand specified by fire professionals around the world, VESDA is synonymous with reliable, high-performance fire detection.

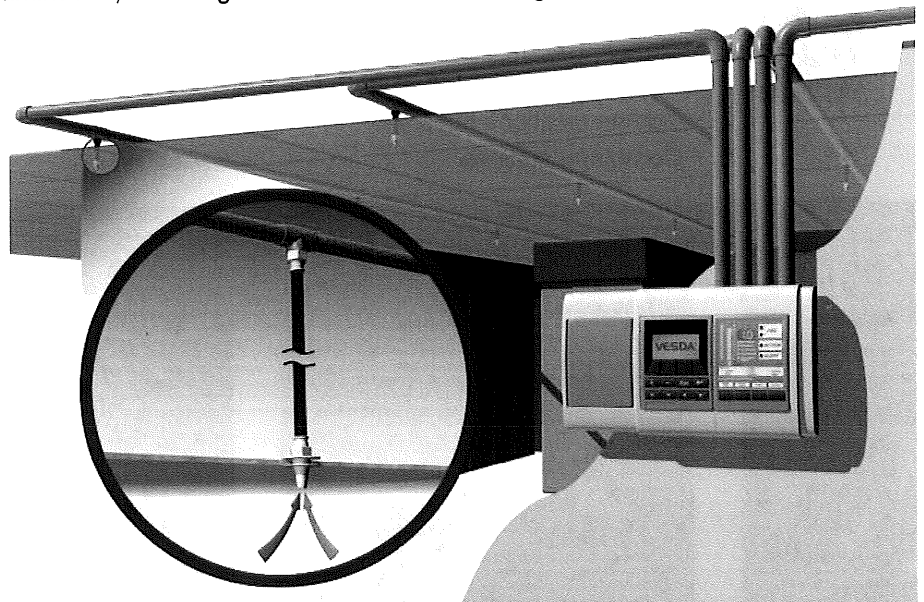


This diagram shows the progression of a fire over time. Note that the incipient stage of a fire provides the widest window of opportunity to detect and control the spread. VESDA detectors can be configured to generate multiple alarms within the incipient stage. They also can be configured to generate an additional alarm (Fire 2) in the advanced stages of a fire. This feature is unique to VESDA and takes advantage of its wide sensitivity range that enables one detector to monitor the entire progression of a fire.

How VESDA Works

VESDA works by continuously drawing air into a distributed pipe network via a high-efficiency aspirator. The air sample then passes through a dual-stage filter. The first stage removes dust and dirt from the air sample before it enters the laser detection chamber. The second, ultra-fine stage provides an additional clean-air supply to keep the detector's optical surfaces free from contamination, ensuring stable calibration and long detector life as well as minimizing nuisance alarms.

From the filter, the air sample goes through the calibrated detection chamber where it is exposed to a laser light source. When smoke is present, light is scattered within the detection chamber and is instantly identified by the highly sensitive receiver system. The signal is then processed and presented via a bar-graph display, alarm threshold indicators and/or graphic display. VESDA detectors are able to communicate this information to a fire alarm control panel, a software management system, or a building management system via relays or a High Level Interface (HLI).



4

When unobtrusive detection is required

Is it important to preserve the internal design/decoration of the building? Is vandalism a problem with the current smoke detection system?

A VESDA system can be installed with tiny capillary sampling tubes, which are barely discernible to the human eye. The detectors can be placed in a cupboard or utility area. Great for:

- Modern offices
- Cathedrals
- Art galleries and museums
- Heritage buildings
- Prisons and detention centers
- Prestigious residences

5

When evacuation is a challenge

Will the building be open to the general public? Will it house people who need extra help during an evacuation? Is evacuation difficult due to crowds or limited exits? What is the business impact of an evacuation?

The very early warning that a VESDA system provides allows the maximum time for evacuation. This is critical for:

- Shopping centers
- Stadiums
- Heritage buildings
- Hospitals
- Underground tunnels
- Facilities for children and the elderly

6

When environmental conditions are difficult

Is poor air quality or are extreme temperatures present in the area to be protected?

VESDA detectors feature dual-stage filtration to ensure they continue to function reliably in dirty environments. The detectors can be installed elsewhere, with only the sampling pipes in the extreme environment. The sampled air can be filtered, warmed or cooled before reaching the detector. Ideal for:

- Power stations
- Public transport
- Paper and saw mills
- Cold stores
- Mines
- Automotive operations
- Manufacturing facilities
- Hazardous areas (Factory Mutual Class 1 Div 2)

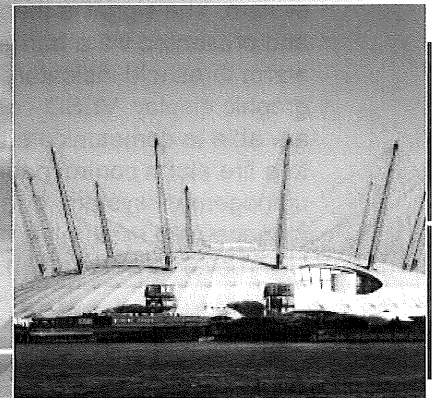
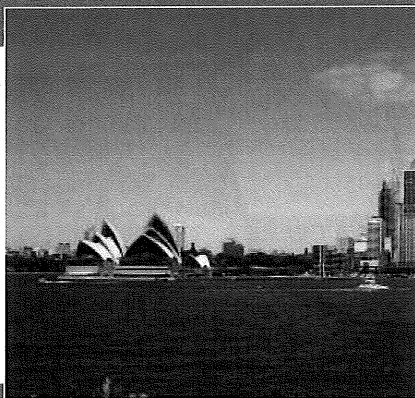
7

When suppression systems are present

Is suppression release costly and disruptive?

The very early warning provided by a VESDA system allows early intervention to prevent suppression releases. The multiple warning levels of a VESDA system can be used to trigger different responses at different stages of a fire — from controlling air conditioning to initiating a suppression release. Applicable for:

- Communications hubs
- Command stations
- Server rooms
- Switch rooms



VESDA by Xtralis Product Range

VESDA VFT

The VESDA VFT is a unique and versatile high-sensitivity ASD that is able to pinpoint the source of incipient smoke to speed response, enhance investigation, and minimize business disruption and downtime. This advanced detector provides intelligent addressability to identify up to 15 protected areas via microbore air-sampling tubes.

VESDA VLP (LaserPLUS™)

The VESDA VLP is the most popular detector in the VESDA by Xtralis product range. Like all VESDA ASDs, it detects fire at the earliest possible stage and reliably measures very low to extremely high concentrations of smoke. It has the world's widest sensitivity range of 0.005 to 20% obs/m (0.0015 to 6% obs/ft). VESDA VLP supports four configurable alarms (Alert, Action, Fire 1 and Fire 2) and protects areas up to 2,000 square meters (20,000 square feet).

VESDA VLS (LaserSCANNER™)

The VESDA VLS locates the origin of smoke by identifying the first sector (pipe) with the highest level of smoke and then continues to sample air from all sectors to monitor fire growth. The VESDA VLS also provides four alarm levels for each individual pipe (Alert, Action, Fire 1 and Fire 2) and provides individual pipe addressability and settings. It protects areas up to 2,000 square meters (20,000 square feet).

VESDA VLC (LaserCOMPACT™)

The VESDA VLC offers cost-effective protection of single environments and small areas. It offers the same wide sensitivity range as the VESDA VLP and VESDA VLS — 0.005 to 20% obs/m (0.0015 to 6% obs/ft). The VESDA VLC supports three configurable alarm levels (Alert, Pre-Alarm and Fire) and comes in two versions. One version interfaces via relays only (RO) and the other across either relays or VESDAnet (VN). In addition, an explosion-proof version of the VN VLC is available for the protection of hazardous areas.

VESDA VLF (LaserFOCUS™)

The VESDA VLF delivers the most advanced and cost-effective air-sampling smoke detection technology for small environments. The VESDA VLF-250 model protects areas up to 250 square meters (2,500 square feet), and the VESDA VLF-500 model covers up to 500 square meters (5,000 square feet). In addition to the features found in all Xtralis Laser products, VESDA VLF provides a new range of features and built-in intelligence for quick installation, commissioning and servicing.

VESDA VLT (LaserTEKNIC™)

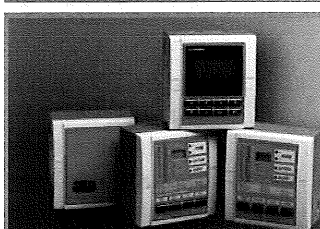
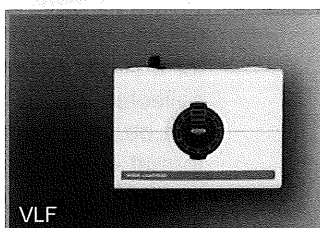
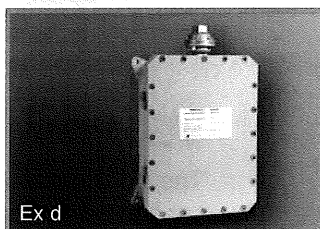
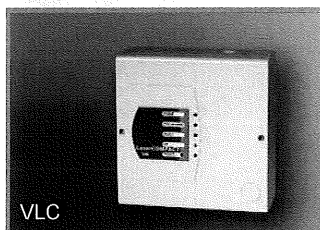
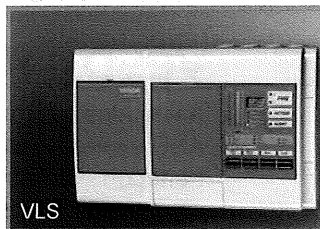
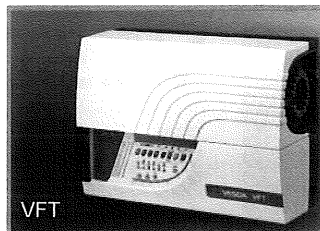
The VESDA VLT enables Original Equipment Manufacturers to offer the benefits of VESDA by Xtralis very early warning smoke detection in their products with little development investment.

Remote Displays and Programmers

The VESDA display module monitors and reports the status of a detector, providing visual representation of smoke levels along with all alarm and fault conditions. For monitoring convenience, multiple displays can be associated with a single detector.

The menu-driven VESDA Programmer allows the user to conveniently configure, commission and maintain the VESDA system, as well as program each individual detector. Only one programmer is needed to support the entire network.

Display and programmer modules can be mounted in a detector unit separately (connected via VESDAnet), in a single remote mounting box, or in a 19-inch sub rack.



VESDA by Xtralis Product Range

VESDAnet™

VESDAnet is a comprehensive, fault-tolerant, "closed," two-wire communications loop that links VESDA detectors, displays, programmers and remote units on a daisy-chained loop. VESDAnet enables a number of units to be programmed together from one or more locations and automatically detects communication failures.

It also easily interfaces with systems external to the network, such as intelligent fire alarm panels and building management systems.

VESDA Pipe

A key element in the performance of a VESDA by Xtralis ASD system is the network of sampling pipes that actively transports air from a protected area to the detector. Xtralis offers an extensive range of pipe and fittings to suit all application needs, ensuring a quality system is installed every time.

Some pipes and fittings are not available in certain countries. Please check with an Xtralis office before you order.



Both VSC and ASPIRE2 are compatible with all detectors in the VESDA product line.

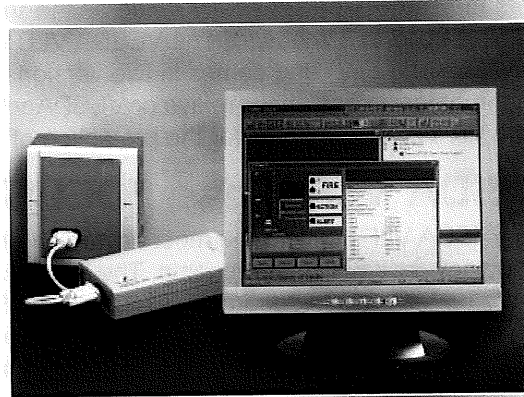
Software

VSM™

The VSM software package allows the user to monitor, configure and control a VESDA by Xtralis system from a central location via a VESDAnet communication loop or directly to VESDA detectors. Real-time and historical events for a single detector or multiple networks of detectors can be collected over a local- or wide-area network. The data then can be processed and presented in either report or graphical format — even graphically on site floor plans.

VSC™

The VSC software package can be used to configure, install, commission and maintain the standard range of VESDA ASDs. The software provides high-level programming flexibility through its on-line and off-line configuration capabilities. Rapid diagnostic abilities, concurrent configuration views, compare/merge functionality, and simultaneous smoke-trend graphing of multiple detectors are additional features designed to simplify operation and installation setup.



VESDA ASPIRE2™

VESDA ASPIRE2 is the latest version of VESDA sampling pipe network design and modeling software. It aids in the design and evaluation process for basic to very complex pipe-network layouts. Key features, such as design wizards, 3-D isometric views, an automated design verification process, and a new AutoBalance capability, ensure that a tailored pipe layout is easily achieved. The Installation Data Pack (IDP) generates a series of reports with the parameters, required materials and expected system performance so installation and commissioning engineers receive this information clearly.

Detector Configurations

Features						
	VFT-15	VLS	VLP	VLC VESDAnet (VN)	VLC Relays Only (RO)	VLF 250/500
Worldwide Approvals	Vds, UL, FM, CSFM	LPC, VdS, AFNOR, UL, ULC, UL268A (in-duct application), FM, NY-MEA, CSFM, ActivFire, CFE.				
Hazardous Area Approval (FM Class 1, Div 2, Groups A, B, C, D)	No	No	Yes	Yes	Yes	Yes
Sensitivity Range	0.001 to 20% obs/m (0.0003 to 6.0% obs/ft)	0.005 to 20% obs/m (0.0015 to 6% obs/ft)				0.025 to 20% obs/m (0.008 to 6.4% obs/ft)
Two-stage Filter	Yes	Yes	Yes	Yes	Yes	Yes
Area Coverage (Maximum)	1,500 m ² (15,000 ft ²) (across 15 sectors)	2,000 m ² (20,000 ft ²) (across 4 sectors)	2,000 m ² (20,000 ft ²)	800 m ² (8,000 ft ²)	800 m ² (8,000 ft ²)	250/500 m ² (2,500/5,000 ft ²)
Multiple Pipe Addressability	Up to 15	Up to 4	No	No	No	No
Total Number of Alarm Thresholds	120 (Day/Night)	32 (Day/Night)	8 (Day/Night)	3	3	8 (Day/Night)
Relay Outputs	5 (Expands to 21)	7 or 12 relays	7	3	3	3 (Expands to 6)
On-board Memory (Max. Events)	Up to 20,000	18,000	18,000	12,000	12,000	18,000
Flow Sensor Circuit (one per pipe inlet)	1 + 1 in chamber	4	4	1	1	1
AutoLearn™ (automatically adjusts system to environment)	No	Yes	Yes	Yes	Yes	AutoLearn Smoke™ AutoLearn Flow™
Supported by ASPIRE2™ Pipe Network Design Software	Yes (transport times only) Predefined networks	Yes	Yes	Yes	Yes	Yes
Maximum No. of Holes	15	60	100	40	40	12/24
Bar Graph/Indicator LED	Yes	Local or Remote (20-segment bargraph display)	Local or Remote (20-segment bargraph display)	Local (5 on-board LEDS, remote 20-segment bar- graph display)	Local (5 on-board LEDS)	Local (7 on-board LEDs, 10-segment circular display)
Programming Tools - On-board Programming Module - Portable Programmer - PC Software (VSC, VSM) via VESDAnet (when the detectors are connected on the VESDA network)	On-board programmer and PC software (VSC/VSM4)	Yes	Yes	Yes	Programmed via RS232 direct connection to PC using VSC	Programmed via RS232 direct connection to PC using VSC
VESDAnet						
Max. No. of Devices/Detectors per Loop	N/A	200/100	200/100	200/100	N/A	200/100 (with VN Card)
Max. Distance between Devices	N/A	1,300 m (4,000 ft)	1,300 m (4,000 ft)	1,300 m (4,000 ft)	N/A	1,300 m (4,000 ft) (with VN Card)
Computer-based Management via VSM	Yes	Yes	Yes	Yes	No	Yes (with VN Card)
Remote Relay Modules - 7-relay version - 12-relay version	N/A	(Part No.) VRT-501 VRT-900	VRT-500 N/A	VRT-500 N/A	N/A	VRT-500 N/A
Compatible Remote Bar-graph Displays - Display, 7-relays - Display, 12-relays - Display, no relays	N/A	(Part No.) VRT-400 VRT-800 VRT-700	VRT-200 N/A VRT-600	VRT-J00 N/A VRT-K00	N/A N/A N/A	VRT-V00 N/A VRT-W00

The full range of VESDA by Xtralis ASDs are EN 54-20 tested and approved.

About Us

Xtralis is a leading global provider of powerful, early warning fire detection and security solutions that prevent disasters by giving users time to respond before life, critical infrastructure or business continuity is compromised. We protect more than 40,000 customer sites in 100 countries, including billions in assets belonging to the world's top governments and businesses. Our solutions include VESDA® by Xtralis – very early warning fire detection, ICAM® by Xtralis – flexible fire and environmental monitoring, ADPRO® by Xtralis – outdoor and enterprise security, and ASIM® by Xtralis – traffic detection.

Xtralis is the leader in very early warning fire detection and invented the VESDA air-sampling smoke detector (ASD), the world's No. 1 ASD brand. Customers worldwide rely on VESDA by Xtralis when business continuity is imperative, environments are challenging, and time is required to ensure safe and orderly evacuation.

VESDA detectors are available in a variety of models to accommodate a broad range of environments and applications. From small to very large, open spaces and from the cleanest to the dirtiest of environments, VESDA provides reliable, high-sensitivity, very early smoke detection.



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www.xtralis.com

BUILDING PERMIT INSPECTION PROCEDURES

Please call 874-8703 or 874-8693 (ONLY)

or email: buildinginspections@portlandmaine.gov

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

- **Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.**
- **Permits expire in 6 months. If the project is not started or ceases for 6 months.**
- **If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue.**

Final Fire

The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OF CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCUPIED.



Flexible Discharge Bend

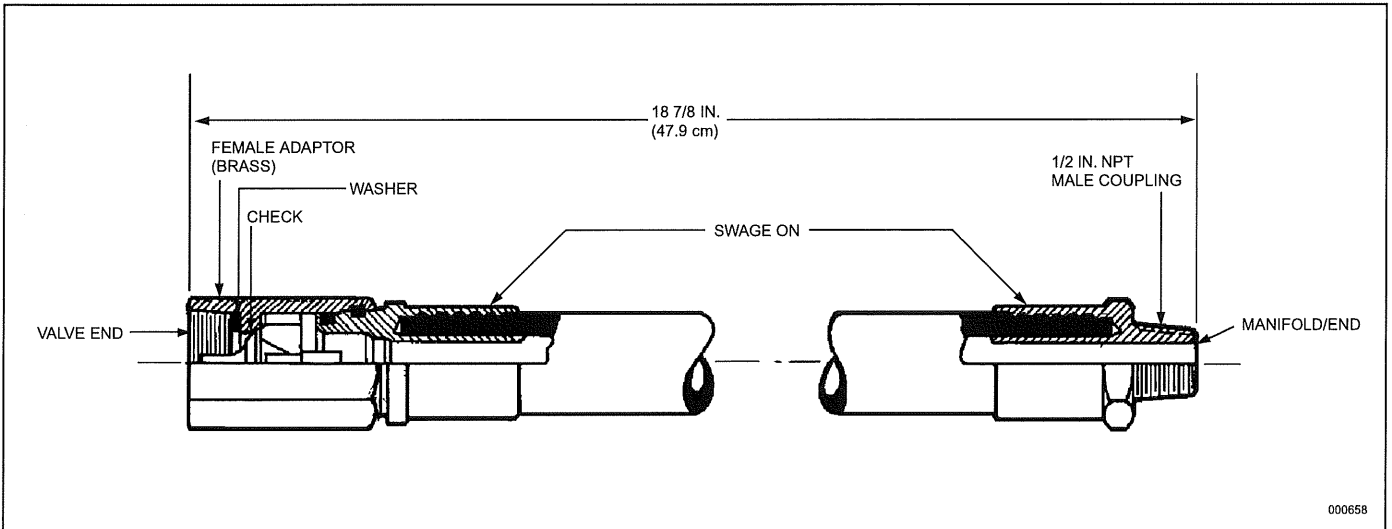
Description

- ▶ The valve Flexible Discharge Bend (Part No. 427082) is a 5/8 in. (1.59 cm) I.D. extra-heavy flexible hose which connects the valve discharge outlet to the fixed piping or header manifold. The discharge bend has a special female thread for connecting to the valve outlet and a male 1/2 in. NPT thread for connecting to the fixed piping or manifold.
- ▶ The discharge bend will withstand a pressure of 9000 psi (621 bar). Its flexible connection allows for easy alignment of multiple cylinder banks to fixed piping. Each bend has a built-in check valve that prevents loss of agent should the system discharge while any cylinder is removed.

The equivalent length of this hose is equal to 18 ft. (5.5 m) of 1/2 in. Sch. 40 pipe.

Shipping Assembly Part No.	Description
▶ 427082	Flexible discharge bend
842430	Washer

Component	Material	Thread Size/Type		Approvals
		Valve End	Manifold End	
▶ 5/8 in. Flexible Discharge Bend	SAE 100 R2 Type AT	Special to mate with CV90 and CV-98 Valve	1/2 in. NPT Male	FMRC Approved UL Listed (EX-4510)



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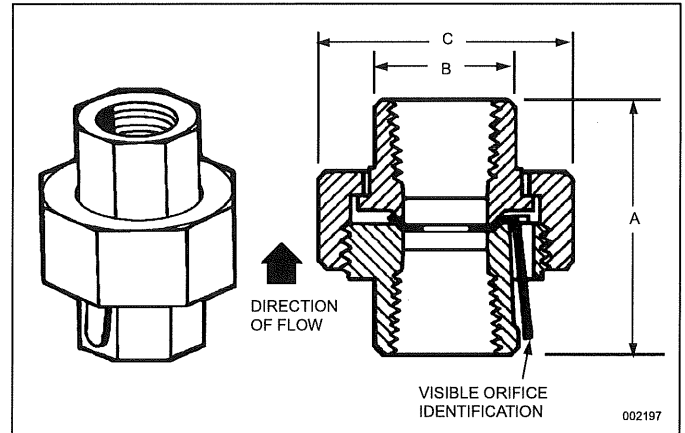


Pressure Reducer/Union

Description

The pressure reducer/union is required to restrict the flow of INERGEN® agent thus reducing the agent pressure down stream of the union. The 3000 psi (206.9 bar) NSCWP union contains a stainless steel orifice plate which is drilled to the specific size hole required based on the flow calculation.* The orifice plate provides readily visible orifice identification. The orifice union is available in six sizes: 1/2 in., 3/4 in., 1 in., 1 1/4 in., 1 1/2 in., and 2 in. NPT.

All pressure reducer/unions must be installed in the piping with the orifice identification tab on the pressure inlet side of the system. The 1 1/4 in., 1 1/2 in. and 2 in. orifice unions must be installed per the direction of the flow arrow stamped on the body.



Shipping Assembly Part No.	Description	A	B	C
416677	1/2 in. NPT pressure reducer/union	2.06 in. (5.2 cm)	1.18 in. (2.9 cm)	1.95 in. (4.9 cm)
416678	3/4 in. NPT pressure reducer/union	2.38 in. (6.1 cm)	1.50 in. (3.8 cm)	2.38 in. (6.1 cm)
416679	1 in. NPT pressure reducer/union	2.63 in. (6.7 cm)	1.78 in. (4.5 cm)	2.77 in. (7.0 cm)
416680	1 1/4 in. NPT pressure reducer/union	2.94 in. (7.5 cm)	2.04 in. (5.2 cm)	3.31 in. (8.4 cm)
416681	1 1/2 in. NPT pressure reducer/union	3.31 in. (8.4 cm)	2.31 in. (5.9 cm)	3.70 in. (9.4 cm)
416682	2 in. NPT pressure reducer/union	3.56 in. (9.0 cm)	2.85 in. (7.2 cm)	4.39 in. (11.2 cm)

Component	Material	Thread Size	Approvals
Pressure Reducer/Union	Body: Forged Steel Orifice Plate: Stainless Steel	1/2, 3/4, 1, 1 1/4, 1 1/2, 2 in. NPT	FMRC Approved UL Listed (EX-4510)

- ▶ NOTE: Refer to "Nozzle/Pressure Reducer Range Chart" in
- ▶ Design Section for detailed orifice range information.

* Orifice diameter must be specified when placing order.

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