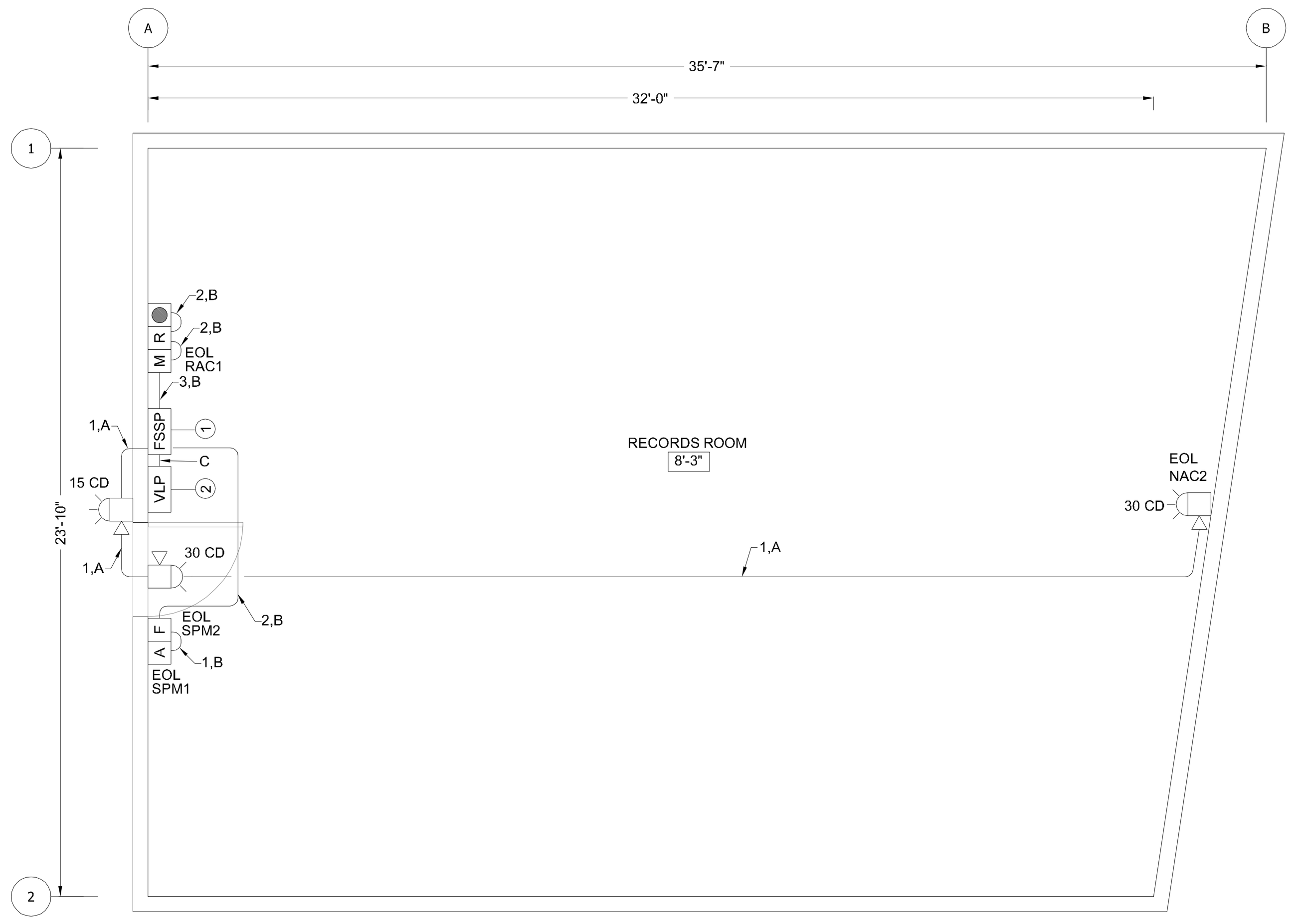
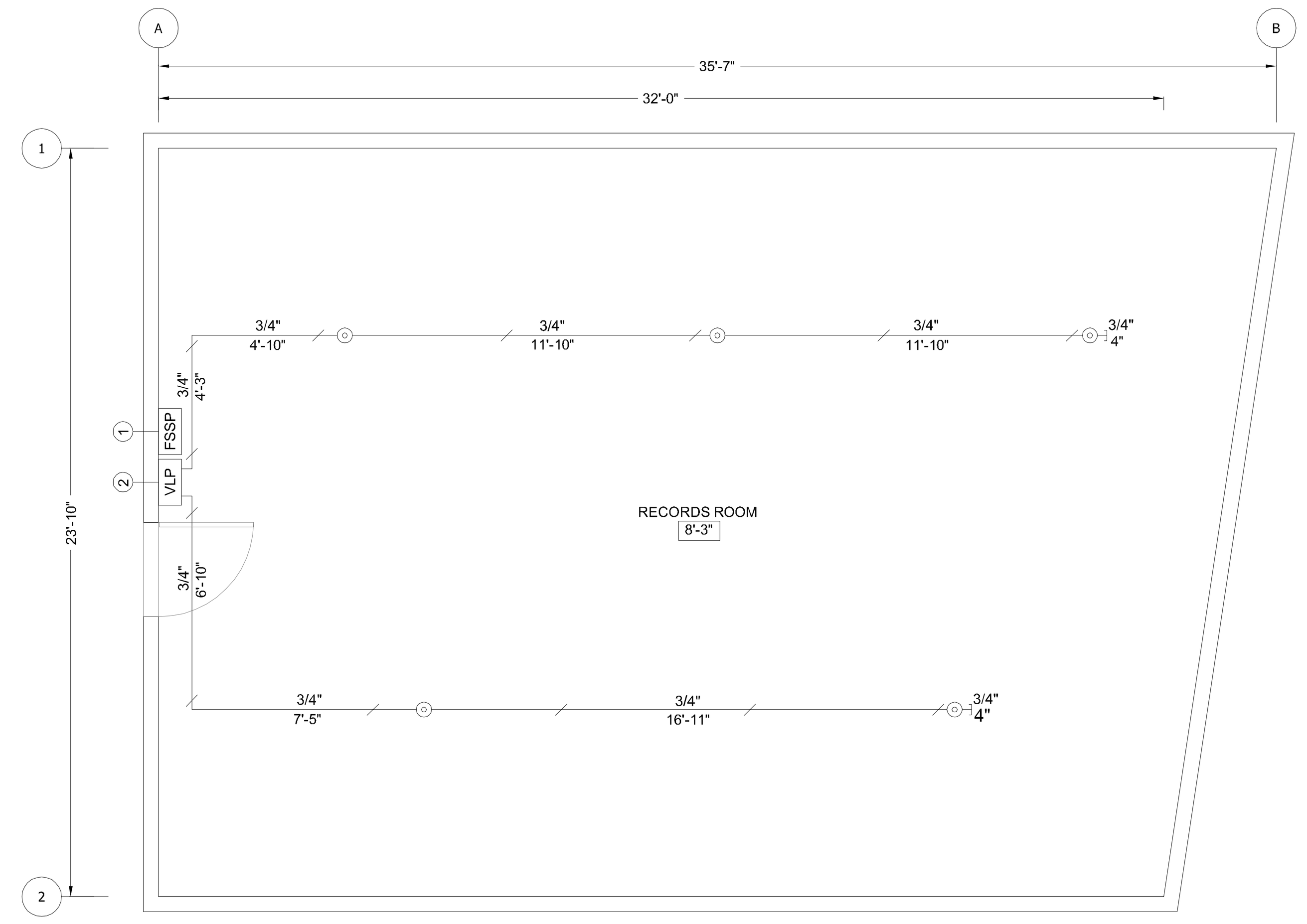
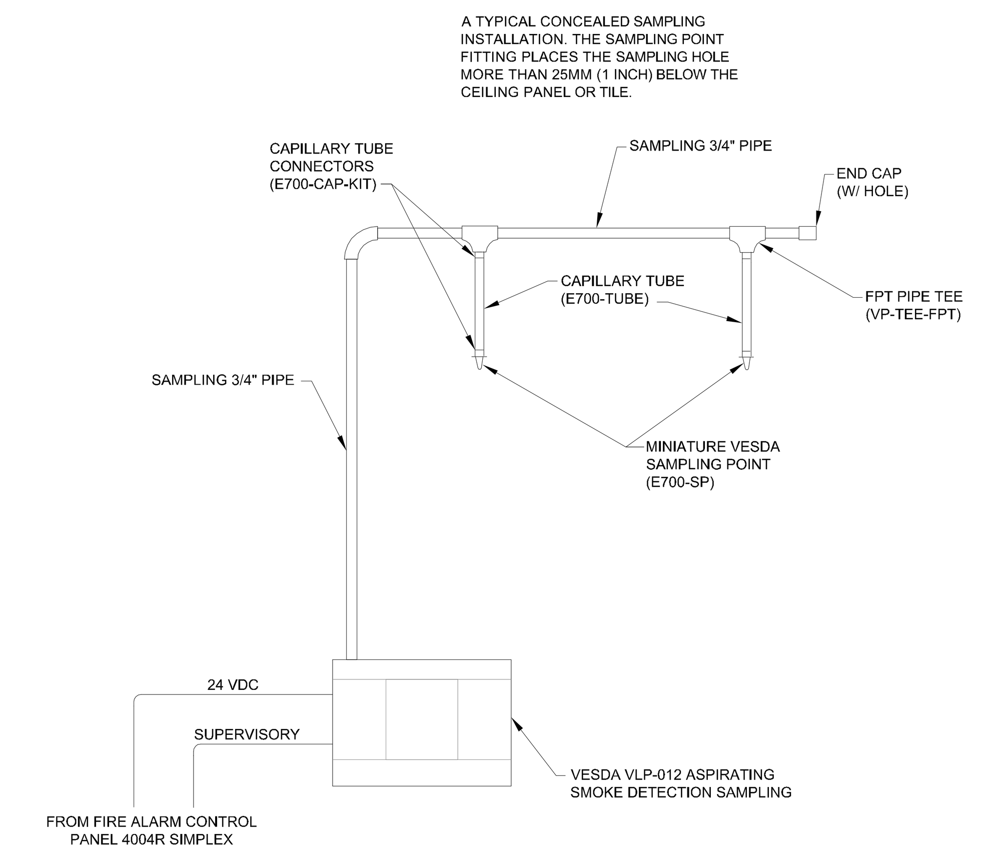


FLOOR PLAN-ELECTRICAL SCALE: 1/4"=1'-0"



AIR SAMPLING SMOKE DETECTION - RECORDS ROOM SCALE: 1/4"=1'-0"



VESDA DETAIL

CALCULATION DATA

ANSUL
INERGEN DESIGNER
Version 2. 1. 2
UL listed EX4510, FMRC Approved (J.I.) 2Y0A9.AF, ULC listed CEx1151

Agent Storage Conditions

Storage pressure is 2175 psia at 70 degrees Fahrenheit.
439 cubic feet of INERGEN stored in each of 7 cylinders.
Total agent in storage is 3073 cubic feet.
Time to discharge 2766 cubic feet (90% of INERGEN) is 58.5 seconds
Maximum pressure downstream of manifold orifice is 1286 psia

Concentrations

Area	Volume	95% Time (sec)	Cu Ft Discharged	Maximum Concentration at Max Temperature	Minimum Concentration at Min Temperature	Requested Concentration at Min Temperature
Records Room	6704.9	57	3073.0	37.3% at 80'F	36.2% at 60'F	34.2% at 60'F

Sea level equivalent oxygen: 13.2% at 80'F

Free Vent Calculation

Area	Peak Rate	Maximum Wall Strength	Minimum Free Vent Area
Records Room	8047.9 cfm	5.0 lbs./sq.ft.	308 sq. in.

Pressure Drop Results

Sec Start	Sec End	Nominal Pipe Size	Length (ft)	Equiv 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	985	595.1
2	3	1 1/2 80 T	1.0	3.5	0.0	MFLD	985	987	595.1
3	4	1 1/2 80 T	1.0	3.5	0.0	MFLD	987	987	1190.3
4	5	1 1/2 80 T	1.0	3.5	0.0	MFLD	987	986	1785.4
5	6	1 1/2 80 T	1.0	3.5	0.0	MFLD	986	985	2380.5
6	7	1 1/2 80 T	1.0	3.5	0.0	MFLD	985	983	2975.7
7	8	1 1/2 80 T	1.0	3.5	0.0	MFLD	983	980	3570.8
8	9	1 1/2 80 T	1.0	7.3	1.0	MFLD	980	975	4165.9
9	10	ORIFICE .578 INCHES DRILL NO. 37/64					975	435	4165.9
10	11	1 1/2 40 T	2.5	2.5	2.5		435	576	4165.9
11	12	1 1/2 40 T	18.0	22.0	0.0		576	559	4165.9
12	13	1 1/2 40 T	12.0	16.0	0.0		559	547	4165.9
13	301	1 1/2 40 T	8.0	20.1	−1.0	BULL	547	547	2083.
13	302	1 1/2 40 T	8.0	20.1	−1.0	BULL	547	547	2083.

Calculation based on 70 degree Fahrenheit pre-discharge Pipeline Temperature

Pipe and Fittings

Sec Start	Sec End	Nominal Pipe Size	Length (ft)	Side 90's	Thru Tee	Unions/ Tee	Valve/ Cplgs	(ft)
1	2	1/2 40 T	0.0	0	0	0	0	Cyl Valve 38 ft
2	3	1 1/2 80 T	1.0	0	0	1	0	
3	4	1 1/2 80 T	1.0	0	0	1	0	
4	5	1 1/2 80 T	1.0	0	0	1	0	
5	6	1 1/2 80 T	1.0	0	0	1	0	
6	7	1 1/2 80 T	1.0	0	0	1	0	
7	8	1 1/2 80 T	1.0	0	0	1	0	
8	9	1 1/2 80 T	1.0	1	0	1	0	
9	10	1 1/2 80 T		0	0	0	0	Man. Orifice
10	11	1 1/2 40 T	2.5	0	0	0	0	
11	12	1 1/2 40 T	18.0	1	0	0	0	
12	13	1 1/2 40 T	12.0	1	0	0	0	
13	301	1 1/2 40 T	8.0	1	1	0	0	
13	302	1 1/2 40 T	8.0	1	1	0	0	

Nozzle Performance Summary

Nozzle Number	Nominal Pipe Size	Drill Number	Drill Diameter	Quantity (cu ft) Discharged	Area Name
301	1 1/2 40 T	37/64	0.578	1536.5	Records Room
302	1 1/2 40 T	37/64	0.578	1536.5	Records Room

Messages/Errors

ANSUL 150 bar INERGEN DESIGNER Version number 2.1.2
UL listed EX4510, FMRC Approved (J.I.) 2Y0A9.AF, ULC listed CEx1151
Calculation done on 5/14/2013 at 12:37:39 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 Simplex Grinnell

AIR SAMPLING SYSTEM - VESDA INSTALLATION NOTES:

AIR SAMPLING SMOKE DETECTION PER NFPA 72 2010 AND MANUFACTURER'S MANUAL.
UL LISTED, PRE LABELED.
MAXIMUM AIR SAMPLE TRANSPORT TIME FROM THE FARTHEST SAMPLING POINT SHALL NOT EXCEED 60 SECONDS.
THE SAMPLING PORTS AND IN-LINE FILTER, IF USED, SHALL BE KEPT CLEAR.
AIR-SAMPLING NETWORK PIPING AND FITTINGS SHALL BE AIR TIGHT AND PERMANENTLY FIXED.
PIPE SHALL BE SUPPORTED AT NOT LESS THAN 5 FT. O.C.

PIPE NETWORK/SAMPLE POINTS REQUIREMENTS:

SAMPLING PIPE NETWORK	AGGREGATE PIPE LENGTH: 200 m. (650 FT.) PIPE MODELLING DESING TOOL: ASPIRE2

KEY NOTES

1. FIRE SUPPRESSION SYSTEM PANEL
2. NEW AIR SAMPLING SYSTEM TO BE INSTALLED AS PER MANUFACTURER'S SPECIFICATIONS. VESDA VLP-012.
3. SINGLE PIPE NETWORK TO BE PROVIDED. (MAXIMUM PIPE LENGTH ACCORDANCE WITH VISION SYSTEMS COMPUTER DESING TOOL (ASPIRE) AND NFPA STANDARS)

PARTS LIST-VESDA

QTY.	PART NO.	DESCRIPTION
1	VLP-012	LASERPLUS DET. CEN MNT LCD PRG
1	VPS-100US-120	PS SGL ZONE, HSG, 120VAC
2	VBT-012	BATTERY, SEALED LA, 12VDC, 12A
1	VP-P-210	VESDA PIPE, 210 FT.
1	VP-ELB-90	PIPE ELBOW, 90 DEGREE 20 PER PK.
1	VP-COUP	VESDA PIPE COUPLING 15 PER BOX
1	VP-EC	PIPE END CAP 25 PER BOX
1	VP-TEE-FPT	CPVC PIPE TEE 3/4" FPT, 10 BOX
1	VP-TEE	PIPE TEE 15 PER BOX
5	E700-CAP-KIT	CONN. KIT FOR MINI SAMP PT/CAP
5	E700-SP	MINI SAMPLING POINT PLASTIC
1	E700-TUBE	ROLL BLACK POLY TUBING 50 FT.
2	VP-CEMENT	VESDA SOLVENT CEMENT, 1 PINT
1	E700-SP-DCL	SAMPL POINT DECAL QTY. 200
100	DPSG	DP GAS SYSTEMS
3	DSGN LAB	DESING LABOR
8	INST LAB	INSTALLATION LABOR
8	TECH LAB	TECHNICAL LABOR

VESDA NOTES AND REQUIREMENTS

VESDA BATTERY CALCULATIONS:

Battery Calculation Worksheet
(all currents stated in A)

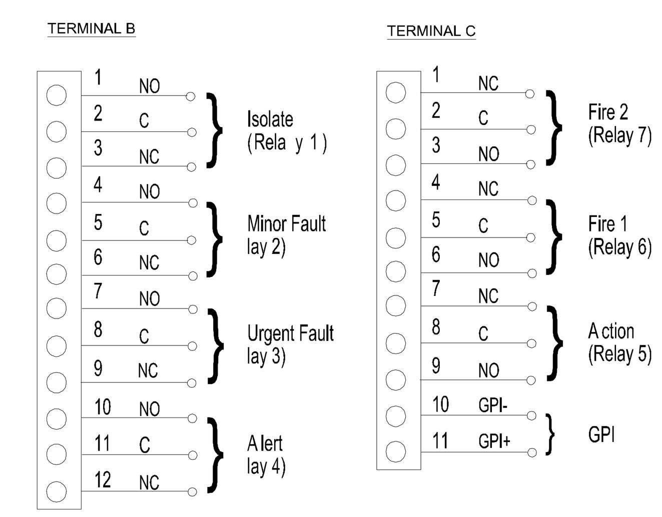
Device Description	Quantity of Devices	Standby A Per Device	Alarm A Per Device	Tot. Device Standby A	Tot. Device Alarm A
VESDA VLP Detector @3000 rpm	1	0.24000	0.29000	0.24000	0.29000
Device Totals	**1**			0.24000	0.29000
			Total Alarm A/h	**0.240**	**0.290**

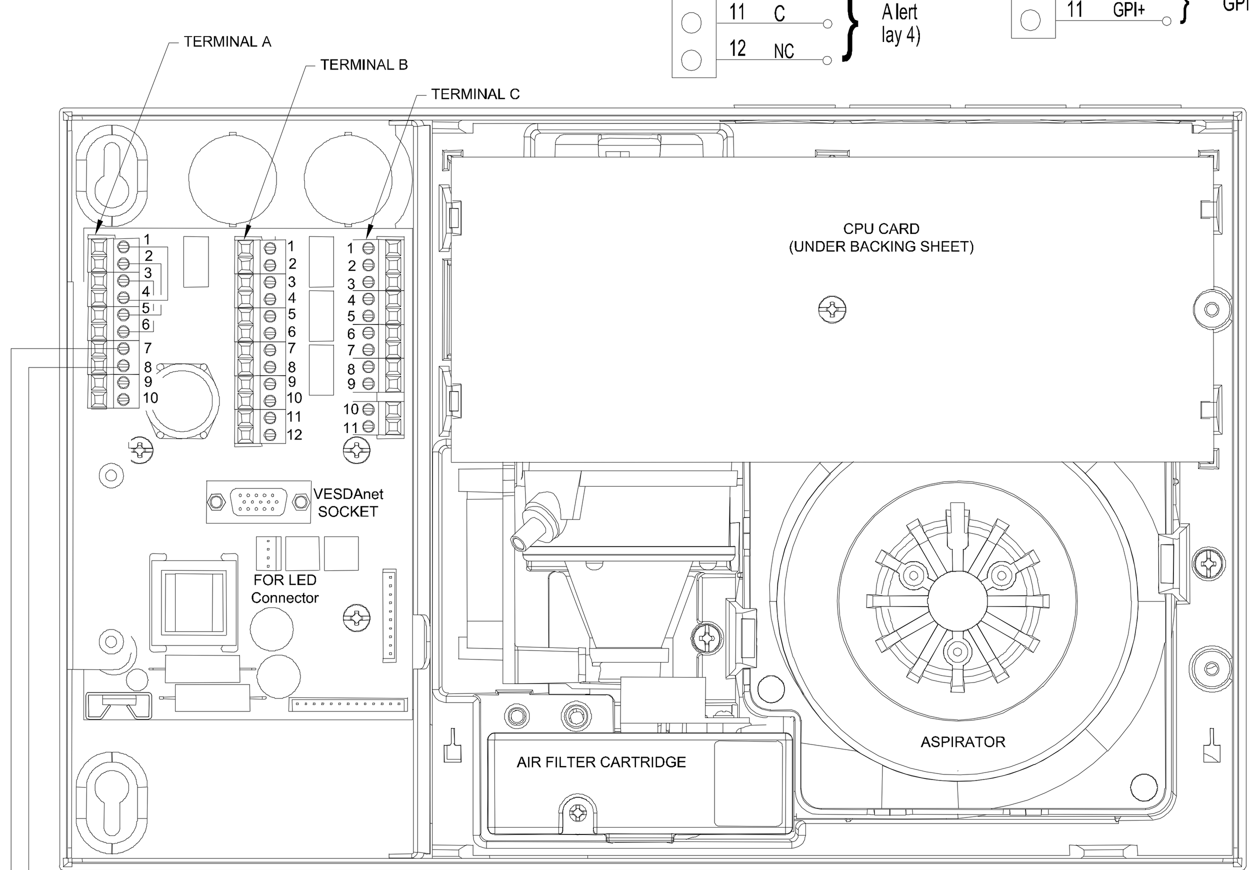
Summary Section	
Standby Hrs. Required	24
Alarm Sounding Minutes	5
Total System Standby A/H	0.24
Total System Alarm A/H	0.29
Total System Standby in 24hrs	5.760000
Total System Alarm A/H in 5min	0.024167
Min. A/H Battery Required	**5.78**
DERATING FACTOR	**1.25**
Recommended A/H Battery	**7.03**

BATTERY CALCULATIONS

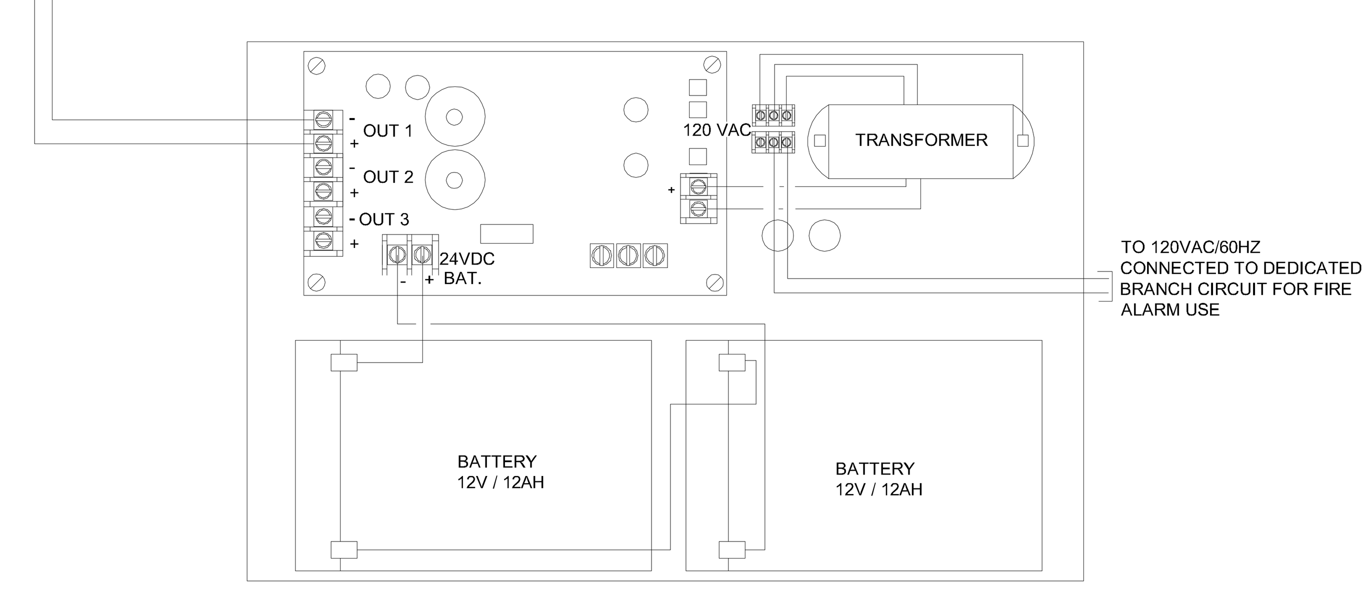
Terminal A	Terminal B	Terminal C
1 VESDAnet A+	1 Isolate (NO)	1 Fire 2 (NC)
2 VESDAnet A-	2 Isolate (C)	2 Fire 2 (C)
3 Shield	3 Isolate (NC)	3 Fire 2 (NO)
4 VESDAnet B+	4 Minor Fault (NO)	4 Fire 1 (NC)
5 VESDAnet B-	5 Minor Fault (C)	5 Fire 1 (C)
6 Shield	6 Minor Fault (NC)	6 Fire 1 (NO)
7 Power (+)	7 Urgent Fault (NO)	7 Action (NC)
8 Power (-)	8 Urgent Fault (C)	8 Action (C)
9 Power (+)	9 Urgent Fault (NC)	9 Action (NO)
10 Power (-)	10 Alert (NO)	10 GPI -
	11 Alert (C)	11 GPI +
	12 Alert (NC)	

GPI = GENERAL PURPOSE INPUT





VESDA VLP-012 ASPIRATING SMOKE DETECTION SAMPLING



VESDA POWER SUPPLY

VESDA & POWER SUPPLY SCHEMATIC

NO.	DATE	REVISION DESCRIPTION	CHGD BY

tyco Fire & Security / SimplexGrinnell

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INERGEN−FIRE SUPPRESSION−SYSTEM

BERNSTEIN, SHUR, SAWYER & NELSON
100 MIDDLE STREET
WEST TOWER PORTLAND, ME. 04104-5025

DRAWN BY: SEFP	DATE: MAY 23, 2013
DESIGNED BY: SEFP	DATE: MAY 23, 2013
APPROVED BY:	DATE:
PROJECT NUMBER:	
SHEET TITLE: INERGEN-FIRE SUPPRESSION-SYSTEM	
SHEET NUMBER: 2 OF 3	