



FIRE ALARM RISER DIAGRAM
SCHEMATIC: NO SCALE

FACP Battery Calculation

8/8/2017

PROJECT NAME: Waynelete Lower School
 Required Standby Time: 24 Hours
 Required Alarm Time: 5 Minutes

AC Branch Current:		AC Branch Current		Amps @ 120V		
Regulated Load in Standby						
Device Type	Number of Devices	Current (Amps)		Total Current (Amps)		
FACP MAINBOARD	1	X	0.29000	=	0.29000	
SMOKE DETECTOR	65	X	0.00025	=	0.01625	
HEAT DETECTOR	3	X	0.00030	=	0.00090	
MONITOR MODULE	11	X	0.00500	=	0.05500	
DUCT DETECTOR	1	X	0.00030	=	0.00030	
RELAY MODULE	7	X	0.00026	=	0.00179	
PULL STATION	10	X	0.00030	=	0.00300	
TOTAL ALARM LOAD					0.36724	
Regulated Load in ALARM						
Device Type	Number of Devices	Current (Amps)		Total Current (Amps)		
FACP MAINBOARD	1	X	0.53000	=	0.53000	
SMOKE DETECTOR	65	X	0.00650	=	0.42250	
HEAT DETECTOR	3	X	0.00650	=	0.01950	
MONITOR MODULE	11	X	0.00038	=	0.00413	
DUCT DETECTOR	1	X	0.00650	=	0.00650	
RELAY MODULE	7	X	0.00026	=	0.00179	
PULL STATION	10	X	0.00030	=	0.00300	
FACP-1 (See Voltage Drop Calculations)	1	X	0.55100	=	0.55100	
FACP-2 (See Voltage Drop Calculations)	1	X	0.69100	=	0.69100	
FACP-3 (See Voltage Drop Calculations)	1	X	0.75600	=	0.75600	
FACP-4 (See Voltage Drop Calculations)	1	X	0.68000	=	0.68000	
FACP-5 (See Voltage Drop Calculations)	1	X	0.66700	=	0.66700	
FACP-6 (See Voltage Drop Calculations)	1	X	0.93500	=	0.93500	
TOTAL ALARM LOAD					5.26741	
Battery Requirements						
Standby Load Current (Amps)	0.36724	X	Required Standby Time in Hours	24.00000	=	8.81364
Alarm Load Current (Amps)	5.26741	X	Required Alarm Time in Hours	0.08333	=	0.43895
Total Ampere Hours (before derating factor)						9.25259
Derating Factor					X	1.2
TOTAL AMPERE HOURS REQUIRED						11.10311
BATTERIES TO BE PROVIDED (2 - 12v)						18 AH

Point to Point NAC Voltage Drop Calculation

7/31/2017

Project Name: Waynelete Lower School
 Circuit Number: FACP-1

Nominal System Voltage: 20.4 volts
 Minimum Device Voltage: 16.0 volts
 Distance from source to 1st device: 55 feet
 Wire Gauge for balance of circuit: 14

Wire Resistance: 3.07 Per 1000
 Resistance: 3.07

Max Output Current: 3.00 amps
 Total Circuit Current: 0.551 amps
 End of Line Voltage: 19.79 volts

Circuit is within limits

Device	Device Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.074	55	20.21	0.186	0.91%
Device 2	0.054	10	20.18	0.215	1.06%
Device 3	0.054	60	20.03	0.371	1.82%
Device 4	0.121	50	19.92	0.484	2.37%
Device 5	0.054	30	19.87	0.530	2.60%
Device 6	0.043	40	19.82	0.578	2.83%
Device 7	0.054	20	19.80	0.596	2.92%
Device 8	0.043	15	19.79	0.605	2.97%
Device 9	0.054	25	19.79	0.614	3.01%
Totals	0.551	305			

Notes:
 Wire resistance is doubled in the calculations for two wires (Positive and Negative).
 The voltage calculated to the last device must not be lower than the manufactures listed minimum operating voltage (IE: rated operating voltage 16-33 VDC (24 VDC nominal)).

Point to Point NAC Voltage Drop Calculation

7/31/2017

Project Name: Waynelete Lower School
 Circuit Number: FACP-2

Nominal System Voltage: 20.4 volts
 Minimum Device Voltage: 16.0 volts
 Distance from source to 1st device: 195 feet
 Wire Gauge for balance of circuit: 14

Wire Resistance: 3.07 Per 1000
 Resistance: 3.07

Max Output Current: 3.00 amps
 Total Circuit Current: 0.691 amps
 End of Line Voltage: 19.14 volts

Circuit is within limits

Device	Device Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.162	195	19.57	0.827	4.06%
Device 2	0.043	20	19.51	0.892	4.37%
Device 3	0.054	20	19.45	0.952	4.67%
Device 4	0.074	20	19.39	1.005	4.93%
Device 5	0.054	25	19.34	1.060	5.20%
Device 6	0.043	25	19.29	1.107	5.42%
Device 7	0.043	15	19.27	1.131	5.54%
Device 8	0.054	35	19.22	1.178	5.77%
Device 9	0.043	50	19.17	1.228	6.02%
Device 10	0.121	40	19.14	1.258	6.16%
Totals	0.691	445			

Notes:
 Wire resistance is doubled in the calculations for two wires (Positive and Negative).
 The voltage calculated to the last device must not be lower than the manufactures listed minimum operating voltage (IE: rated operating voltage 16-33 VDC (24 VDC nominal)).

DATE: 8/8/17

DESCRIPTION: ISSUED FOR REVIEW & APPROVAL

REVISION: 0

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WAYNFLETE LOWER SCHOOL
360 SPRING STREET
PORTLAND, MAINE 04102
FIRE ALARM RISER AND CALCS

DRAWN	MN UNICAD JOB #17431
CHECKED	BRADY B. HAWIS NICET III 138751
DATE	8/8/17
REVISION	0
SCALE	1/8"=1'-0"

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