

DC WORST CASE VOLTAGE DROP CALCULATION REMOTE POWER SUPPLY (RPS#1) FORMULA FOR VOLTAGE DROP CALCULATION I = TOTAL CURRENT FLOW IN ALARM CONDITION L = LENGTH OF CIRCUIT FROM SUPPLY TO LAST DEVICE (IN FEET) 3.26 = RESISTIVITY OF COPPER CONDUCTOR PER 1,000 FT C.M. = CROSS SECTIONAL AREA OF CONDUCTOR IN 1,000 FT, #14 AWG = 4110 CM VOLTAGE DROP = (A) x (L) x 2 X (3.26) % V.D. = $\frac{V.D. \times 100}{1000}$:24=% LENGTH (L) X 2 X CURRENT (I) X 3.26 1000 : 24 X 100 =% CIRCUIT #1 4 (HORN/STROBE) TOTALS 0.83A 0.83A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 300' 300' X 2 X 0.83A X 3.26 : 24 X 100 =6.8% DROP 1000 CIRCUIT #2 3 (HORN/STROBE) TOTALS 0.618A 0.618A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 400' 400' X 2 X 0.618A X 3.26 : 24 X 100 =6.7% DROP 1000 CIRCUIT #3 4 (HORN/STROBE) TOTALS 0.659A 0.659A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 320' 320' X 2 X 0.659A X 3.26 : 24 X 100 =5.7% DROP 1000 CIRCUIT #4 4 (HORN/STROBE) TOTALS 0.677A 0.677A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 230' 230' X 2 X 0.677A X 3.26 : 24 X 100 =4.2% DROP 1000	DC WORST CASE VOLTAGE DROP CALCULATION REMOTE POWER SUPPLY (RPS#2) FORMULA FOR VOLTAGE DROP CALCULATION I = TOTAL CURRENT FLOW IN ALARM CONDITION L = LENGTH OF CIRCUIT FROM SUPPLY TO LAST DEVICE (IN FEET) 3.26 = RESISTIVITY OF COPPER CONDUCTOR PER 1,000 FT C.M. = CROSS SECTIONAL AREA OF CONDUCTOR IN 1,000 FT, #14 AWG = 4110 CM VOLTAGE DROP = (A) x (L) x 2 X (3.26) % V.D. = $\frac{V.D. \times 100}{1000}$:24=% LENGTH (L) X 2 X CURRENT (I) X 3.26 1000 : 24 X 100 =% CIRCUIT #5 2 (HORN/STROBE) TOTALS 0.406A 0.406A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 320' 320' X 2 X 0.406A X 3.26 : 24 X 100 =3.5% DROP 1000 CIRCUIT #6 3 (HORN/STROBE) TOTALS 0.618A 0.618A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 280' 280' X 2 X 0.618A X 3.26 : 24 X 100 =4.7% DROP 1000 CIRCUIT #7 16 (DOOR HOLDER) TOTALS 0.48A 0.48A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 400' 400' X 2 X 0.48A X 3.26 : 24 X 100 =5.2% DROP 1000 CIRCUIT #8 12 (DOOR HOLDER) TOTALS 0.36A 0.36A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 400' 400' X 2 X 0.36A X 3.26 : 24 X 100 =4.0% DROP 1000	DC WORST CASE VOLTAGE DROP CALCULATION REMOTE POWER SUPPLY (RPS#3) FORMULA FOR VOLTAGE DROP CALCULATION I = TOTAL CURRENT FLOW IN ALARM CONDITION L = LENGTH OF CIRCUIT FROM SUPPLY TO LAST DEVICE (IN FEET) 3.26 = RESISTIVITY OF COPPER CONDUCTOR PER 1,000 FT C.M. = CROSS SECTIONAL AREA OF CONDUCTOR IN 1,000 FT, #14 AWG = 4110 CM VOLTAGE DROP = (A) x (L) x 2 X (3.26) % V.D. = $\frac{V.D. \times 100}{1000}$:24=% LENGTH (L) X 2 X CURRENT (I) X 3.26 1000 : 24 X 100 =% CIRCUIT #9 8 (HORN/STROBE) TOTALS 0.641A 0.641A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 380' 380' X 2 X 0.641A X 3.26 : 24 X 100 =6.7% DROP 1000 CIRCUIT #10 9 (HORN/STROBE) TOTALS 0.712A 0.712A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 380' 380' X 2 X 0.712A X 3.26 : 24 X 100 =7.0% DROP 1000 CIRCUIT #11 7 (HORN/STROBE) TOTALS 0.46A 0.46A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 250' 250' X 2 X 0.46A X 3.26 : 24 X 100 =3.3% DROP 1000 CIRCUIT #12 8 (HORN/STROBE) TOTALS 0.72A 0.72A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 350' 350' X 2 X 0.72A X 3.26 : 24 X 100 =7.0% DROP 1000	DC WORST CASE VOLTAGE DROP CALCULATION REMOTE POWER SUPPLY (RPS#4) FORMULA FOR VOLTAGE DROP CALCULATION I = TOTAL CURRENT FLOW IN ALARM CONDITION L = LENGTH OF CIRCUIT FROM SUPPLY TO LAST DEVICE (IN FEET) 3.26 = RESISTIVITY OF COPPER CONDUCTOR PER 1,000 FT C.M. = CROSS SECTIONAL AREA OF CONDUCTOR IN 1,000 FT, #14 AWG = 4110 CM VOLTAGE DROP = (A) x (L) x 2 X (3.26) % V.D. = $\frac{V.D. \times 100}{1000}$:24=% LENGTH (L) X 2 X CURRENT (I) X 3.26 1000 : 24 X 100 =% CIRCUIT #13 7 (HORN/STROBE) TOTALS 0.46A 0.46A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 270' 270' X 2 X 0.46A X 3.26 : 24 X 100 =3.5% DROP 1000 CIRCUIT #14 8 (HORN/STROBE) TOTALS 0.56A 0.56A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 350' 350' X 2 X 0.54A X 3.26 : 24 X 100 =5.2% DROP 1000 CIRCUIT #15 7 (HORN/STROBE) TOTALS 0.46A 0.46A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 270' 270' X 2 X 0.46A X 3.26 : 24 X 100 =3.6% DROP 1000 CIRCUIT #16 8 (HORN/STROBE) TOTALS 0.72A 0.72A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 370' 370' X 2 X 0.72A X 3.26 : 24 X 100 =7.3% DROP 1000	DC WORST CASE VOLTAGE DROP CALCULATION REMOTE POWER SUPPLY (RPS#5) FORMULA FOR VOLTAGE DROP CALCULATION I = TOTAL CURRENT FLOW IN ALARM CONDITION L = LENGTH OF CIRCUIT FROM SUPPLY TO LAST DEVICE (IN FEET) 3.26 = RESISTIVITY OF COPPER CONDUCTOR PER 1,000 FT C.M. = CROSS SECTIONAL AREA OF CONDUCTOR IN 1,000 FT, #14 AWG = 4110 CM VOLTAGE DROP = (A) x (L) x 2 X (3.26) % V.D. = $\frac{V.D. \times 100}{1000}$:24=% LENGTH (L) X 2 X CURRENT (I) X 3.26 1000 : 24 X 100 =% CIRCUIT #17 20 (MINI HORN) TOTALS 0.30A 0.30A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 650' 650' X 2 X 0.30A X 3.26 : 24 X 100 =5.3% DROP 1000 CIRCUIT #18 22 (MINI HORN) TOTALS 0.33A 0.33A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 700' 700' X 2 X 0.33A X 3.26 : 24 X 100 =6.3% DROP 1000 CIRCUIT #19 23 (MINI HORN) TOTALS 0.340A 0.340A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 750' 750' X 2 X 0.345A X 3.26 : 24 X 100 =7.0% DROP 1000 CIRCUIT #20 22 (MINI HORN & HORN/STROBE) TOTALS 0.724A 0.724A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 740' 740' X 2 X 0.724A X 3.26 : 24 X 100 =7.3% DROP 1000	DC WORST CASE VOLTAGE DROP CALCULATION REMOTE POWER SUPPLY (RPS#6) FOR HANDICAP UNITS FORMULA FOR VOLTAGE DROP CALCULATION I = TOTAL CURRENT FLOW IN ALARM CONDITION L = LENGTH OF CIRCUIT FROM SUPPLY TO LAST DEVICE (IN FEET) 3.26 = RESISTIVITY OF COPPER CONDUCTOR PER 1,000 FT C.M. = CROSS SECTIONAL AREA OF CONDUCTOR IN 1,000 FT, #14 AWG = 4110 CM VOLTAGE DROP = (A) x (L) x 2 X (3.26) % V.D. = $\frac{V.D. \times 100}{1000}$:24=% LENGTH (L) X 2 X CURRENT (I) X 3.26 1000 : 24 X 100 =% CIRCUIT #21 4 (HORN/STROBE) TOTALS 0.54A 0.54A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 180' 180' X 2 X 0.54A X 3.26 : 24 X 100 =3.0% DROP 1000 CIRCUIT #22 7 (HORN/STROBE) TOTALS 0.94A 0.94A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 220' 220' X 2 X 0.94A X 3.26 : 24 X 100 =5.7% DROP 1000 CIRCUIT #23 4 (HORN/STROBE) TOTALS 0.54A 0.54A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 200' 200' X 2 X 0.54A X 3.26 : 24 X 100 =3.0% DROP 1000 CIRCUIT #24 4 (HORN/STROBE) TOTALS 0.54A 0.54A 14awg CIRCULAR MILS 4110 F.A.P. SYSTEM 24 VOLT WIRE RUN 220' 220' X 2 X 0.54A X 3.26 : 24 X 100 =3.3% DROP 1000
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SILENT KNIGHT MODEL 5104
BATTERY CALCULATIONS FOR FIRE COMMUNICATOR

DEVICE	TOTAL STAND-BY	TOTAL ALARM
5104	0.05 A	0.135 A
TOTAL STAND-BY = 0.05 A STAND-BY X 24 HOURS =1.2 A/HR TOTAL ALARM = 0.135A X 5 MIN = 0.012 A/HR TOTAL BATTERY REQUIREMENTS = 0.147 A/HR BATTERY TO BE INSTALLED = 7.00 A/HR		

SEPARATE PERMIT REQUIRED

WORSE CASE BATTERY CALCULATION

FACP (EST-2)							
PANEL			STANDBY CURRENTALARM CURRENT				
1	2-MCD	MAIN CONTROL AND DISPLAY	0.150	0.150	0.275	0.275	
1	2-LCD	DISPLAY MODULE	0.040	0.040	0.050	0.050	
3	2-12R	16 RED LEDS	0.002	0.006	0.015	0.045	
1	2-12Y	16 YELLOW LEDS	0.002	0.002	0.015	0.015	
			PANEL TOTALS		0.198	0.385	
DETECTION DEVICES							
67	SIGA-PS	Smoke Detector	0.000045	0.003015	0.000045	0.003015	
4	SIGA-SD	Duct Detector	0.000045	0.00018	0.000045	0.00018	
13	SIGA-270	Single Stage Pull Stations	0.000250	0.00325	0.00040	0.00520	
1	SIGA-HRS	Heat Detectors	0.000045	0.000045	0.000045	0.000045	
6	SIGA-CT2	Dual Input Module	0.000396	0.002376	0.000680	0.00408	
2	SIGA-CT1	Single Input Module	0.000250	0.00050	0.000400	0.0008	
6	SIGA-CC1	Single Module	0.000223	0.001338	0.000100	0.00060	
4	SIGA-CR	Single Module	0.000100	0.00040	0.000100	0.00040	
			DETECTION DEVICE TOTALS		0.011104	0.01432	
STAND BY			ALARM				
Controls stby			0.198	Controls alarm			0.385
Detection device stby			0.011104	Detection alarm			0.01432
STBY PER HR.			0.21	Signal alarm			0.40
24 x No. of hrs			24	SUBTOTAL ALARM			0.084
TOTAL STBY			5.04	5 minute alarm(x 0.084)			
				TOTAL FOR ALARM			0.034
Totals							
TOTAL STBY +			5.04				
TOTAL ALARM			0.034				
SUBTOTAL			5.074				
TOTAL CURRENT X DETRACTING FACTOR = 5.034 X 1.2 = 6.0							
MINIMUM BATTERY Amp/Hs REQUIRED (2) 12 V X 7.00 AMP/HR							

ALARM ENGINEERS
11145 TAMPA AVE. SUITE #24B
NORTH RIDGE, CA. 91326
TEL. (818) 831-5390 FAX. (818) 831-5391 LIC. # C10 867596

Project:
91 UNITS APARTMENT BUILDING
20223-20237 W. SATICOY STREET
WINNETKA, CALIFORNIA 91306

Revisions		
No.	Date	Description
S/S/06		FIRST RELEASE
Δ		

Sheet Title:
FIRE ALARM SYSTEM
WORST CASE &
BATTERY CALCULATIONS

Sheet Number:

FA-05