FIRE ALARM SYSTEM FOR:

WHATABURGER

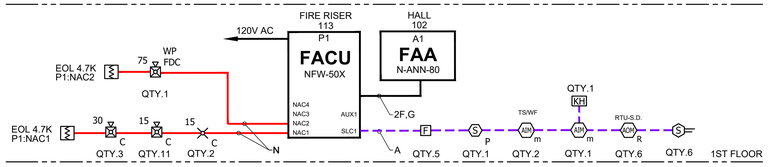
1450 NE DOUGLAS ST.
LEE SUMMIT, MISSOURI 64086

FIRE ALARM SYMBOL LEGEND

SYMBOL	DESCRIPTION	PART NUMBER
FACU	FIRE ALARM CONTROL UNIT	NFW-50X
FAA	ANNUNCIATOR	N-ANN-80
S P	INTELLIGENT ADDRESSABLE PHOTO DETECTOR	NP-200
S	INNOVAIRFLEX INTELLIGENT DUCT DETECTOR HOUSING W/SMOKE HEAD	DNR/NP-200R
F	PULL STATION	NOT-BG12LX
AOM R	ADDRESSABLE RELAY MODULE	NC-100R
AIM m	ADDRESSABLE MINI MONITOR MODULE	NMM-100P
15 C	2 WIRE HORN/STROBE, STANDARD CD, WHITE, CEILING	PC2WL
15 C	2 WIRE STROBE, STANDARD CD, WHITE, CEILING	SCWL
WP 15	2 WIRE HORN/STROBE, STANDARD CD, WHITE, OUTDOOR	P2WK
RTS	REMOTE TEST STATION	RTS-151
	EOL RESISTOR	REL-4.7K
KH	KITCHEN HOOD	OTHERS
FARC	FIRE ALARM RECORD CABINET	SAE10
FARD	FIRE ALARM RECORD DRAWINGS	SAE60

FIRE ALARM WIRING LEGEND

WIRE TYPE	DESCRIPTION	LINE TYPE
A	SIGNALING LINE - UNSHIELDED #16 TWISTED PAIR	
N	NOTIFICATION - UNSHIELDED #14 PAIR	
U	INTERCONNECT- #12 GAUGE 3 CONDUCTOR THHN	



RISER DIAGRAM

SHEET LEGEND

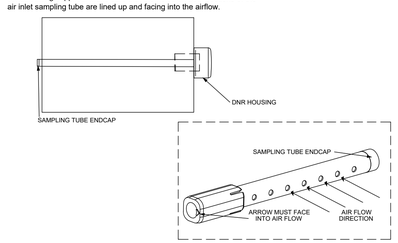
SHEET NUMBER	SHEET REFERENCE NUMBER	DESCRIPTION
1	FA-001	COVER SHEET, LEGEND & RISER DIAGRAM
2	FA-101	INITIATION & NOTIFICATION
3	FA-501	DETAILS, BATTERY CALCULATIONS & SEQUENCE OF OPERATION MATRIX

THIS PROJECT REQUIRES UUFX OR UUJS CERTIFICATION, PER THIS MUNICIPALITY'S CURRENT ORDINANCE

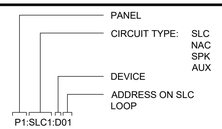
INSTALLING CONTRACTOR WILL NEED TO PROVIDE ACCURATE AS-BUILT INFORMATION TO TECH ELECTRONICS. THIS SHALL INCLUDE ALL WIRING TYPE AND ROUTING INFORMATION FOR ALL ADDRESSABLE LOOP (SLC), HORN, SPEAKER AND STROBE (NAC) AND ZONE (IDC) CIRCUITS. THE AS-BUILT DRAWINGS SHALL SHOW THE EXACT QUANTITY AND PLACEMENT OF ALL DEVICES AND EACH EXACT DEVICE ADDRESS INSTALLED, IF APPLICABLE. ALL DELETED, ADDED AND CHANGES MUST BE SHOWN.

ALL 120VAC POWER SHALL BE NOTED WITH THE CIRCUIT BREAKER NUMBER, SIZE OF BREAKER AND THE LOCATION OF THE CIRCUIT BREAKER PANEL. THE CIRCUIT BREAKER MUST BE LOCKED. ALL ABOVE INFORMATION IS REQUIRED BY AND SHALL BE PROVIDED PER NFPA 72. SEE CURRENTLY ENFORCED ORDINANCE IF NECESSARY.

Per NFPA sampling tubes over 3 feet long should be supported at the end opposite of the duct detector. In ducts wider than 8 feet, work must be performed inside the duct to couple the other section of the sampling tube to the section already installed using the ½ inch conduit fitting supplied. Make sure that the holes on both sections of the air inlet sampling tube are lined up and facing into the airflow.



DUCT DETECTOR MOUNTING



ADDRESS LABEL CLARIFICATION

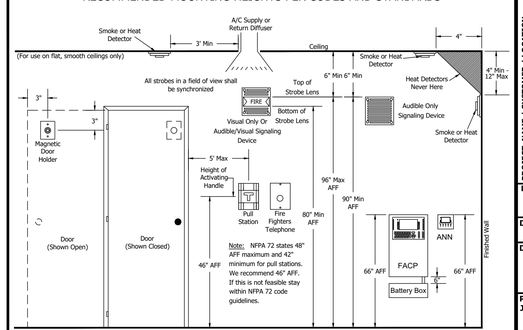
ABBREVIATIONS

AHJ - AUTHORITY HAVING JURISDICTION
DD - DUCT DETECTOR
DH - DOOR HOLDER
DUA- DWELLING UNIT ALARM
E- PSD/HD W/ ELEV INTERFACE
ELEV1- PRIMARY ELEVATOR RECALL
ELEV2- ALTERNATE ELEVATOR RECALL
EST- ELEVATOR SHUNT TRIP
EXG - EXISTING
FH- ELEVATOR FIREHAT
FL - FIELD LOCATE
FM- FLUSH MOUNT
FGS- FIRE PLACE GAS SHUTOFF
FSD- FIRE/SMOKE DAMPER
KB- KNOX BOX
KH- KITCHEN HOOD
PIV- SPRINKLER POST INITIATOR VALVE
NT- NAC TRIGGER
RD- RETURN DUCT
RL- RELOCATE
RTU- ROOF TOP UNIT
SD- SUPPLY DUCT
TS - TAMPER SWITCH
VL - VERIFY LOCATION
WF - WATERFLOW
WP- WEATHER PROOF

GENERAL INSTALLATION NOTES:

1. INSTALLATION MUST COMPLY WITH ALL APPLICABLE FEDERAL, STATE, OR LOCAL LAWS, REGULATIONS, CODES, AND SPECIFICATIONS. THIS SYSTEM SHALL BE IN STRICT CONFORMANCE WITH THESE DRAWINGS; 2018 IBC ; NFPA 72 2016 EDITION; NFPA 70, 2017 EDITION; AND AHJ.
2. WHERE CONDUCTORS ARE RUN IN CONDUIT, USE ONLY APPROVED CABLE WITHIN RACEWAYS, PIPES OR CONDUITS. ALL SHIELDED WIRE MUST BE CONTINUOUS THROUGHOUT CIRCUIT, ALL SHIELDS SHALL BE ISOLATED FROM GROUND, ALL SHIELDS SHALL TERMINATE AT THE FIRE ALARM CONTROL PANEL (FACP) ONLY.
3. PER NFPA 72 2016, 17.7.1.11 - WHERE DETECTORS ARE INSTALLED FOR SIGNAL INITIATION DURING CONSTRUCTION, THEY SHALL BE CLEANED AND VERIFIED TO BE OPERATING IN ACCORDANCE WITH THE LISTED SENSITIVITY, OR THEY SHALL BE REPLACED PRIOR TO THE FINAL COMMISSIONING OF THE SYSTEM. WHERE DETECTORS ARE INSTALLED BUT NOT OPERATIONAL DURING CONSTRUCTION, THEY SHALL BE PROTECTED FROM CONSTRUCTION DEBRIS, DUST, DIRT, AND DAMAGE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND VERIFIED TO BE OPERATING IN ACCORDANCE WITH THE LISTED SENSITIVITY, OR THEY SHALL BE REPLACED PRIOR TO THE FINAL COMMISSIONING OF THE SYSTEM. WHERE DETECTION IS NOT REQUIRED DURING CONSTRUCTION, DETECTORS SHALL NOT BE INSTALLED UNTIL AFTER ALL OTHER CONSTRUCTION TRADES HAVE COMPLETED CLEANUP.
4. ALL FIRE ALARM SYSTEM WIRING SHALL BE CLEAR FROM SHORTS, OPENS AND GROUNDS.
5. NOTIFICATION CIRCUIT WIRE RUNS ARE CRITICAL. ANY INCREASE IN LENGTH OF WIRE MAY AFFECT CIRCUIT CONFIGURATIONS.

RECOMMENDED MOUNTING HEIGHTS PER CODES AND STANDARDS



Note:
1. Contact Tech Electronics if you have questions concerning these instructions, discrepencies, or if your specific conditions require a solution not addressed by this document.
2. Refer to the proper device installation instructions for backbox mounting height

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Chicago, Illinois| Bloomington, Illinois | Indianapolis, Indiana
Denver, Colorado | Topeka, Kansas| Kansas City

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1.800.TECH.789

NO.	DATE:	REVISION DESCRIPTION:

PROJECT NAME / CUSTOMER / LOCATION:
WATABURGER
1450 NE DOUGLAS ST.
LEE'S SUMMIT, MISSOURI 64086

SYSTEM DESCRIPTION:
FIRE ALARM SYSTEM

PROJECT MANAGER:
DARIN WASSINGER
(913) 549 - 1965

DESIGNER:

DRAFTER:
KMT

DRAWING #:
FA001

PROJECT JOB#:
PJ2105190011

DATE:
06/03/2021

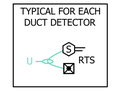
ISSUED FOR:
CONSTRUCTION

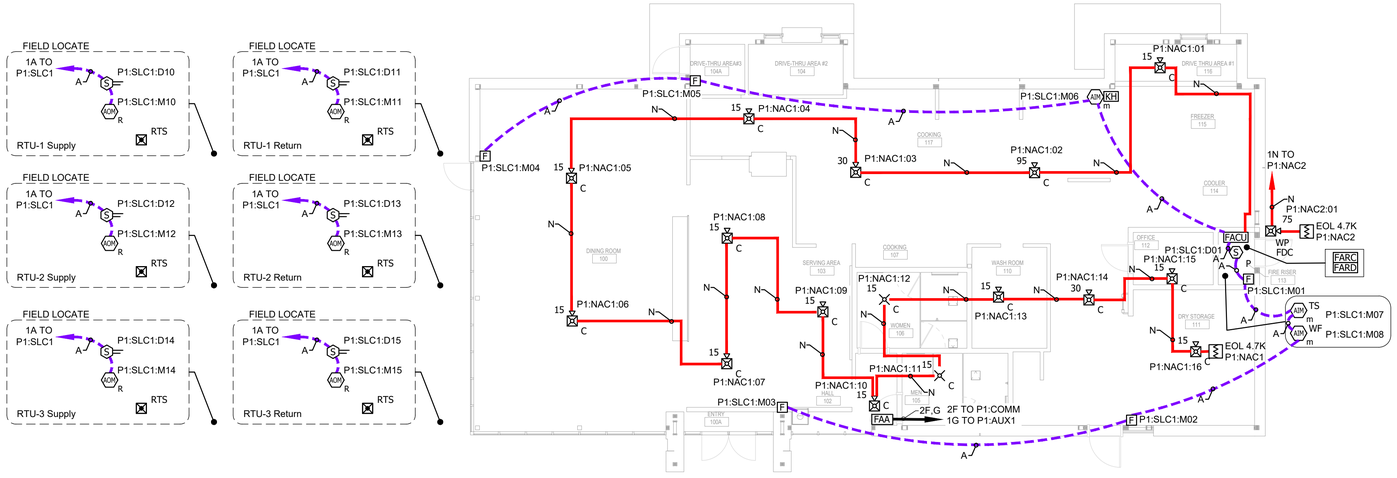
TECH ELECTRONICS
Heights_and_Mounting.dwg:B
11/23/20

FIRE ALARM WIRING LEGEND

WIRE TYPE	DESCRIPTION	LINE TYPE
A	SIGNALING LINE - UNSHIELDED #16 TWISTED PAIR	
N	NOTIFICATION - UNSHIELDED #14 PAIR	
U	INTERCONNECT- #12 GAUGE 3 CONDUCTOR THHN	

TYPICAL FOR EACH DUCT DETECTOR





FLOOR PLAN - FIRE ALARM

1/8" = 1'-0"

0 4' 8' 16'

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1450 NE DOUGLAS ST.
LEE'S SUMMIT, MISSOURI 64086

SYSTEM DESCRIPTION:
FIRE ALARM SYSTEM

PROJECT MANAGER:
DARIN WASSINGER
(913) 549 - 1965

DESIGNER:

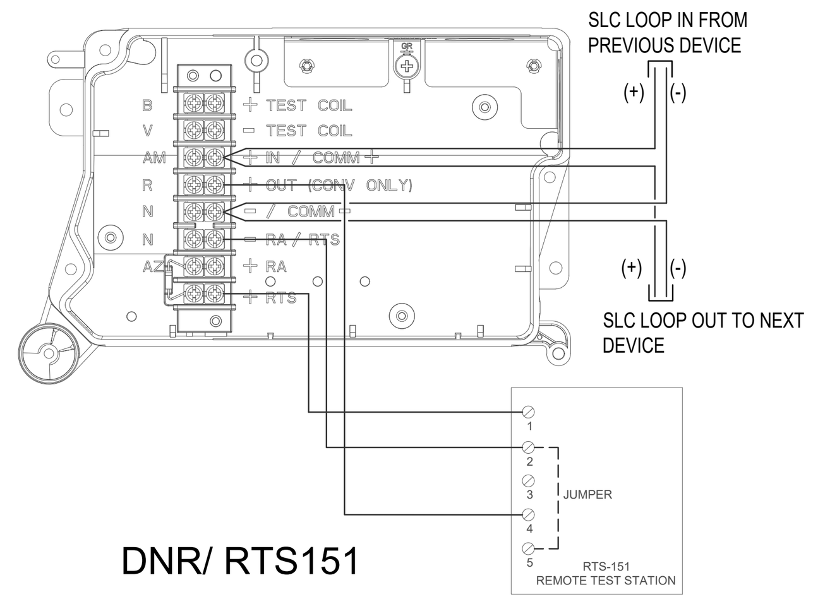
DRAFTER:
KMT

DRAWING #:
FA101

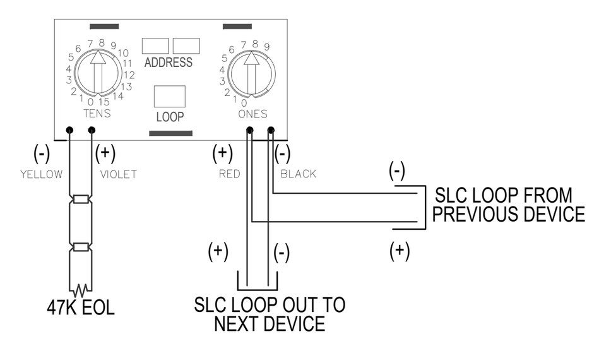
PROJECT JOB#:
PJ2105190011

DATE:
06/03/2021

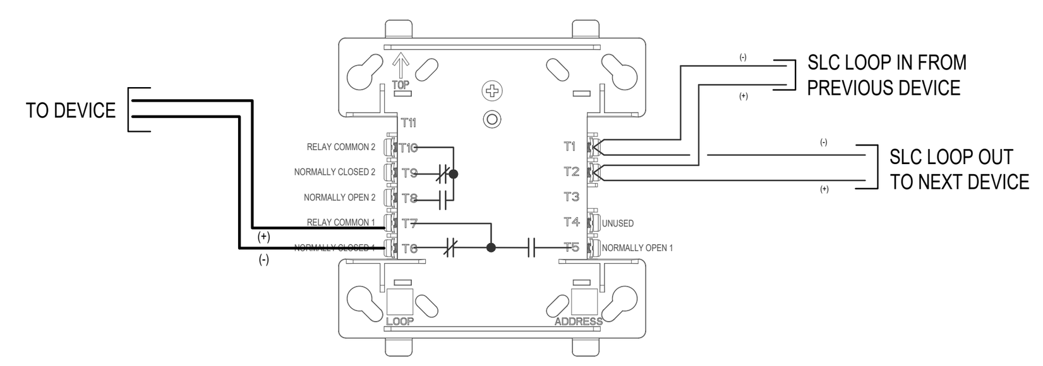
ISSUED FOR:
CONSTRUCTION



DNR/ RTS151

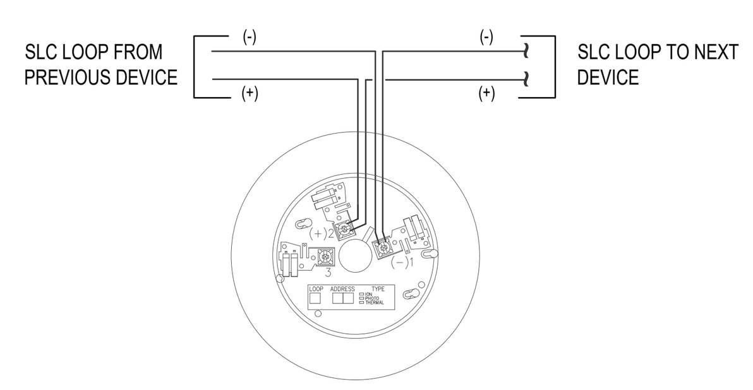


NMM-100P
MINI MONITOR MODULE

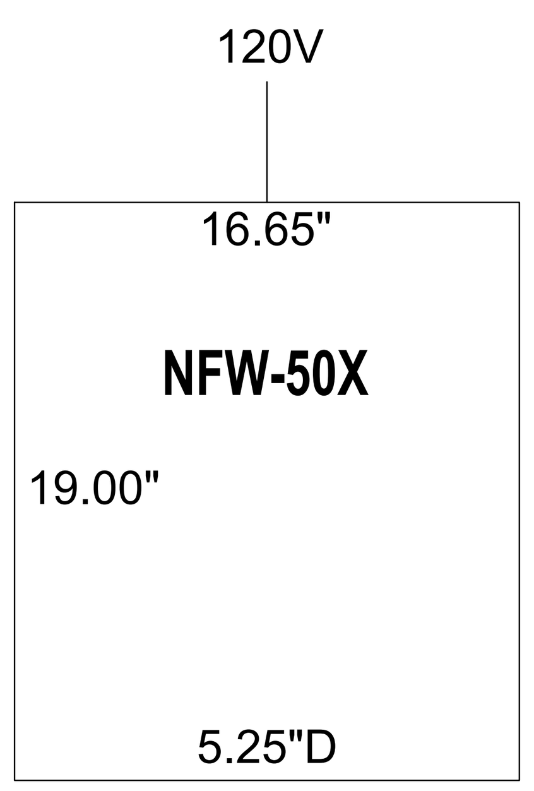


NC-100R
RELAY MODULE

DUCT DETECTOR ASSEMBLY (TYP)

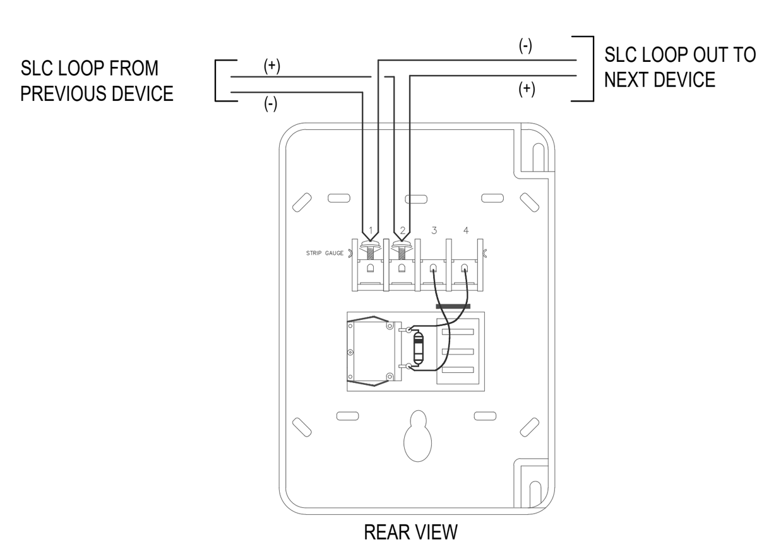


NP-200
PHOTOELECTRIC DETECTOR



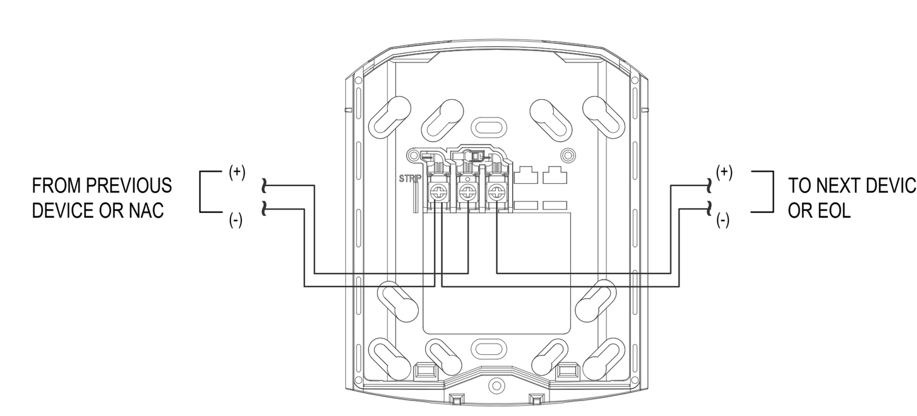
PANEL DETAIL

DO NOT STUB CONDUITS IN THE BOTTOM OF THE BACKBOX.



NOTE: THE NOT-BG12LX CAN BE FLUSH MOUNTED ON A SINGLE GANG DEEP BOX OR CAN BE SURFACE MOUNTED ON A NOTIFIER SB-10 BOX.

NOT-BG12LX



PC2WL/SCWL/P2WK
HORN/STROBE

SYSTEM - OUTPUTS

- CONTROL UNIT ANNUNCIATION
  - A. ACTUATE COMMON VISUAL ALARM SIGNAL INDICATOR
  - B. ACTUATE AUDIBLE ALARM SIGNAL
  - C. ACTUATE COMMON SUPERVISORY SIGNAL INDICATOR
  - D. ACTUATE AUDIBLE SUPERVISORY SIGNAL
  - E. ACTUATE COMMON TROUBLE SIGNAL INDICATOR
  - F. ACTUATE AUDIBLE TROUBLE SIGNAL
- NOTIFICATION
  - G. ACTUATE AUDIBLE NOTIFICATION APPLIANCES
  - H. ACTUATE VISIBLE NOTIFICATION APPLIANCES
  - I. DISPLAY/PRINT CHANGE OF STATUS
  - J. TRANSMIT FIRE ALARM SIGNAL TO SUPERVISING STATION
  - K. TRANSMIT FIRE SUPERVISORY SIGNAL TO SUPERVISING STATION
  - L. TRANSMIT FIRE TROUBLE SIGNAL TO SUPERVISING STATION
- REQUIRED SAFETY CONTROLS
  - M. SHUTDOWN ALL AIR HANDLING UNITS
  - N. SHUTDOWN ASSC. AIR HANDLING UNIT(S)
  - O. ACTUATE FDC NOTIFICATION APPLIANCE

● PERFORM OPERATION/REPORT DEVICE STATUS

	SYSTEM - INPUTS	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
1	MANUAL PULL STATION	●	●					●	●	●	●			●			1
2	SMOKE DETECTOR	●	●					●	●	●	●			●			2
3	WATERFLOW SWITCH	●	●					●	●	●	●			●		●	3
4	DUCT DETECTOR (AT HVAC UNIT)			●	●					●		●			●		4
5	VALVE TAMPER SWITCH			●	●					●		●					5
6	FIRE ALARM CONTROL PANEL AC POWER FAILURE					●	●			●			●				6
7	FIRE ALARM CONTROL PANEL LOW BATTERY					●	●			●			●				7
8	OPEN CIRCUIT					●	●			●			●				8
9	GROUND FAULT					●	●			●			●				9
10	NOTIFICATION APPLIANCE CIRCUIT SHORTED					●	●			●			●				10
11	ALL OTHER TROUBLES					●	●			●			●				11
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	

TECH ELECTRONICS — Battery Calculations for Panel P1

	Part Number	Description	Qty	Standby	Total Standby	Alarm	Total Alarm
Panels							
	NFW-50X	FACP	1	0.12	0.12	0.2	0.2
	N-ANN-80	Annunciator	1	0.015	0.015	0.04	0.04
Peripherals							
SLC	NP-200	Photo Smoke Detector	1	0.0003	0.0003	0.4	0.4
	DNR/NP-200R	Duct Detector	6	0.0003	0.0018		0
	NMM-100P	Mini Monitor Module	3	0.00035	0.00105		0
	NC-100R	Relay Module	6	0.000255	0.00153		0
	NBG-12LX	Pull Station	5	0.0004	0.002		0
NAC	SCWL15	Strobe 15cd, Ceiling	2			0.041	0.082
	PC2WL15	Horn/Strobe 15cd, Ceiling	13			0.071	0.923
	PC2WL30	Horn/Strobe 30cd, Ceiling	3			0.094	0.282
	P2RK110	Horn/Strobe 75cd, Outdoor	1			0.176	0.176

Total Standby Amps	0.1417	Total Alarm Amps	2.103
Batteries 7AH		Standby time 24 hrs	4.080
		Alarm time 5 Mins	0.210
		Battery Requirement	*4.291*

*All values in Amps

Compensation Factor: 1.2

TECH ELECTRONICS — The Power of Connection and Protection®

This calculator provided voltage drop calculations in three formats (Point to Point, End of Line, and Load Centering).
Make sure that you know what method is accepted by, and the results do not exceed the limits set by the respective jurisdiction

Project Name	Whataburger
Date	6/2/2021
Circuit Number	P1:NAC1
Area Covered	
Nominal System Voltage	20.4
Minimum Device Voltage	16
Total Circuit Current	1.145
Wire Manufacturer	
Model Number	

	Wire Gauge	Ohm's Per 1000
Distance from source to 1st device	14	3.07
Wire Gauge for balance of circuit	14	3.07

Point to Point Method			End of Line Method			Load Centering Method		
CIRCUIT IS WITHIN LIMITS			CIRCUIT IS WITHIN LIMITS			CIRCUIT IS WITHIN LIMITS		
Totals Current	Totals Distance	Voltage Drop	Totals Current	Totals Distance	Voltage Drop	Totals Current	Totals Distance	Voltage Drop
1.145	350.000	**1.47**	1.145	350.000	**2.461**	1.145	350.000	**1.230**
End of Line Voltage		**18.93**	End of Line Voltage		**17.94**	End of Line Voltage		**19.17**
Percent Drop		7.21%	Percent Drop		12.06%	Percent Drop		6.03%

End of Line and Load Centering Methods use only the wire guage for the first device to source
Standard Wire Resistance in Ohms per 1000 feet.
18=7.77 16=4.89 14=3.07 12=1.98 10=1.24
18-14 Awg = Solid Conductors 12-10 Awg = Stranded Conductors

Notes:
Wire resistance is doubled in the calculations for two wires (Positive and Negative)
The voltage calculated to the last device in any method must not be lower then
the manufactures listed minimum operating voltage (IE: rated operating voltage 20-32 VDC).

Enter current in amps. .150 = 150 ma

Device Number	Device Current	Distance from previous device	At Device	Voltage Drop from source	Percent Drop
Device 1	0.071	40	20.12	0.281	1.38%
Device 2	0.094	30	19.92	0.479	2.35%
Device 3	0.094	30	19.74	0.660	3.23%
Device 4	0.071	20	19.63	0.768	3.77%
Device 5	0.071	30	19.48	0.918	4.50%
Device 6	0.071	20	19.39	1.010	4.95%
Device 7	0.071	30	19.27	1.134	5.56%
Device 8	0.071	20	19.19	1.208	5.92%
Device 9	0.071	20	19.13	1.273	6.24%
Device 10	0.071	20	19.07	1.329	6.52%
Device 11	0.041	10	19.05	1.353	6.63%
Device 12	0.041	20	19.00	1.396	6.84%
Device 13	0.071	20	18.97	1.434	7.03%
Device 14	0.094	10	18.95	1.448	7.10%
Device 15	0.071	20	18.93	1.466	7.18%
Device 16	0.071	10	18.93	1.470	7.21%
END	0.000	0	18.93	1.470	7.21%
END	0.000	0	18.93	1.470	7.21%
END	0.000	0	18.93	1.470	7.21%
END	0.000	0	18.93	1.470	7.21%
Totals	1.145	350.000	End of Line Voltage		18.93

Device Manufacturer: System Sensor

Horn Strobes - Wall Model #	Candela	Current @Rated Voltage
P2WK15	15	0.079
P2RL30	30	0.094
P2RL75	75	0.139
P2RL95	95	0.160
P2RL110	110	0.182
P2RL135	135	0.211
P2RL185	185	0.262
P2RH-LF	177	0.325
P2RK75	75	0.176

Device Manufacturer: System Sensor

Strobes - Wall Model #	Candela	Current @Rated Voltage
SRL15	15	0.043
SRL30	30	0.063
SRL75	75	0.107
SRL95	95	0.121
SRL110	110	0.148
SRL135	135	0.172
SRL185	185	0.222

Device Manufacturer: System Sensor

Horn Strobes - Ceiling Model #	Candela	Current @Rated Voltage
PC2RL15	15	0.071
PC2RL30	30	0.094

Device Manufacturer: System Sensor

Strobes - Ceiling Model #	Candela	Current @Rated Voltage
SCRL15	15	0.041
SCRL30	30	0.063

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This calculator provided voltage drop calculations in three formats (Point to Point, End of Line, and Load Centering).
Make sure that you know what method is accepted by, and the results do not exceed the limits set by the respective jurisdiction

Project Name	Whataburger
Date	6/2/2021
Circuit Number	P1:NAC2
Area Covered	
Nominal System Voltage	20.4
Minimum Device Voltage	16
Total Circuit Current	0.176
Wire Manufacturer	
Model Number	

	Wire Gauge	Ohm's Per 1000
Distance from source to 1st device	14	3.07
Wire Gauge for balance of circuit	14	3.07

Point to Point Method			End of Line Method			Load Centering Method		
CIRCUIT IS WITHIN LIMITS			CIRCUIT IS WITHIN LIMITS			CIRCUIT IS WITHIN LIMITS		
Totals Current	Totals Distance	Voltage Drop	Totals Current	Totals Distance	Voltage Drop	Totals Current	Totals Distance	Voltage Drop
0.176	30.000	**0.03**	0.176	30.000	**0.032**	0.176	30.000	**0.016**
End of Line Voltage		**20.37**	End of Line Voltage		**20.37**	End of Line Voltage		**20.38**
Percent Drop		0.16%	Percent Drop		0.16%	Percent Drop		0.08%

End of Line and Load Centering Methods use only the wire gauge for the first device to source
Standard Wire Resistance in Ohms per 1000 feet.
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18-14 Awg = Solid Conductors 12-10 Awg = Stranded Conductors

Notes:
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the manufactures listed minimum operating voltage (IE: rated operating voltage 20-32 VDC).

Enter current in amps. .150 = 150 ma

Device Number	Device Current	Distance from previous device	At Device	Voltage Drop from source	Percent Drop
Device 1	0.176	30	20.37	0.032	0.16%
END	0.000	0	20.37	0.032	0.16%
END	0.000	0	20.37	0.032	0.16%
Totals	0.176	30.000	End of Line Voltage		20.37

Device Manufacturer: System Sensor

Horn Strobes - Wall Model #	Candela	Current @Rated Voltage
P2RL15	15	0.073
P2RL30	30	0.094
P2RK75	75	0.176

Device Manufacturer: System Sensor

Strobes - Wall Model #	Candela	Current @Rated Voltage
SRL15	15	0.043
SRL30	30	0.063

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NO.	DATE:	REVISION DESCRIPTION:

PROJECT NAME / CUSTOMER / LOCATION:
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1450 NE DOUGLAS ST.
LEE'S SUMMIT, MISSOURI 64086

SYSTEM DESCRIPTION: FIRE ALARM SYSTEM

PROJECT MANAGER: DARIN WASSINGER (913) 549 - 1965
DESIGNER:
DRAFTER: KMT
DRAWING #: FA501
PROJECT JOB#: PJ2105190011
DATE: 06/03/2021
ISSUED FOR: CONSTRUCTION