

NYC	horizontal assemblies constructed in accordance with	
NYC	Section 712, or both.	
NYC	<b>2702.1.7.2.1 Automatic transfer device room.</b>	
NYC	Equipment located within the automatic transfer	
NYC	device room shall be limited to equipment associ-	
NYC	ated with the emergency or standby power systems.	
NYC	Piping within the room shall be limited to sprinkler	
NYC	piping.	
	<b>2702.2 Where required.</b> Emergency and standby power	
	systems shall be provided where required by this section.	
NYC	<b>2702.2.1 Group A occupancies.</b> Emergency power shall	
NYC	be provided for voice/alarm communication systems in	
NYC	Group A occupancies in accordance with Section	
NYC	907.5.2.2.5.	
NYC	<b>2702.2.1.1 Prior code buildings.</b> In prior code build-	
NYC	ings, where a stationary generator is not otherwise	
NYC	required, the power source for emergency power to the	
NYC	voice/alarm communication system may be served by	
NYC	a gas generator or an uninterruptable power source	
NYC	(UPS) in accordance with the <i>New York City Electri-</i>	
NYC	<i>cal Code</i> .	
NYC	<b>2702.2.2 Smoke control systems.</b> Standby power shall	
NYC	be provided for smoke control systems in accordance	
NYC	with Section 909.11.	
NYC	<b>2702.2.3 Exit signs.</b> Emergency power shall be provided	
NYC	for exit signs in accordance with Section 1013.6.3.	
NYC	<b>2702.2.4 Means of egress illumination.</b> Emergency	
NYC	power shall be provided for means of egress illumination	
NYC	in accordance with Section 1008.3.	
NYC	<b>2702.2.5 Accessible means of egress elevators.</b> Standby	
NYC	power shall be provided for elevators that are part of an	
NYC	accessible means of egress in accordance with Section	
NYC	1009.4.	
NYC	<b>2702.2.6 Horizontal sliding doors.</b> Standby power shall	
NYC	be provided for horizontal sliding doors in accordance	
NYC	with Section 1010.1.4.3.	
NYC	<b>2702.2.7 Semiconductor fabrication facilities.</b> Emer-	
NYC	gency power shall be provided for semiconductor fabri-	
NYC	cation facilities in accordance with Section 415.11.10.	
NYC	<b>2702.2.8 Membrane structures.</b> Standby power shall be	
NYC	provided for auxiliary inflation systems in accordance	
NYC	with Section 3102.8.2. Emergency power shall be pro-	
NYC	vided for exit signs in tents and membrane structures.	
NYC	<b>2702.2.9 Hazardous materials.</b> Emergency or standby	
NYC	power shall be provided in occupancies with hazardous	
NYC	materials in accordance with the <i>New York City Fire</i>	
NYC	<i>Code</i> and Section 414.5.2 of this code.	
NYC	<b>2702.2.10 Highly toxic and toxic materials.</b> Emergency	
NYC	power shall be provided for occupancies with highly	
NYC	toxic or toxic materials in accordance with the <i>New York</i>	
NYC	<i>City Fire Code</i> .	
NYC	<b>2702.2.11 Organic peroxides.</b> Standby power shall be	
NYC	provided for occupancies with organic peroxides in	
NYC	accordance with the <i>New York City Fire Code</i> .	
	<b>2702.2.12 Pyrophoric materials.</b> Emergency power	NYC
	shall be provided for occupancies with silane gas in	NYC
	accordance with the <i>New York City Fire Code</i> .	NYC
	<b>2702.2.13 Covered and open mall buildings.</b> Emer-	NYC
	gency power shall be provided for voice/alarm communi-	NYC
	cation systems in covered and open mall buildings in	NYC
	accordance with Section 402.7.4.	NYC
	<b>2702.2.14 High-rise buildings.</b> Emergency and standby	NYC
	power shall be provided in high-rise buildings in accor-	NYC
	dance with Section 403.4.8.	NYC
	<b>2702.2.15 Underground buildings.</b> Emergency and	
	standby power shall be provided in underground build-	
	ings in accordance with Section 405.8.	NYC
	<b>2702.2.16 Group I-3 occupancies.</b> Emergency power	
	shall be provided for doors in Group I-3 occupancies in	
	accordance with Section 408.4.2.	NYC
	<b>2702.2.17 Elevators.</b> Standby power for elevators,	NYC
	including elevators provided to accommodate ambulance	NYC
	stretchers pursuant to Section 3002.4, shall be provided	NYC
	as set forth in Section 3003.1.	NYC
	<b>2702.2.18 Airport traffic control towers.</b> Standby	NYC
	power shall be provided in airport traffic control towers	NYC
	in accordance with Section 412.3.9.	NYC
	<b>2702.2.19 Smokeproof enclosures and pressurized ele-</b>	NYC
	<b>vator shafts.</b> Standby power shall be provided for	NYC
	smokeproof enclosures as required by Section 909.20.6.2	NYC
	and for pressurized elevator shafts provided in accor-	NYC
	dance with Section 3006.1.	NYC
	<b>2702.2.20 Occupancy Groups B, E and R-1.</b> Emer-	NYC
	gency and standby power shall be required throughout	NYC
	those Group B, E and R-1 occupancies specified in this	NYC
	section:	NYC
	1. Group B occupancies with occupied floor less than	NYC
	75 feet (22 860 mm) above the lowest level of fire	NYC
	department vehicle access having a gross floor area	NYC
	over 15,000 square feet (1393.6 m <sup>2</sup> ) on each floor,	NYC
	or having a total gross floor area of 100,000 square	NYC
	feet (9290.3 m <sup>2</sup> ) or more.	NYC
	2. Group E occupancies with occupied floor less than	NYC
	75 feet (22 860 mm) above the lowest level of fire	NYC
	department vehicle access having a gross floor area	NYC
	over 15,000 square feet (1393.6 m <sup>2</sup> ) on each floor,	NYC
	or having a total gross floor area of 100,000 square	NYC
	feet (9290.3 m <sup>2</sup> ) or more.	NYC
	3. All Group R-1 occupancies.	NYC
	<b>2702.2.20.1 Equipment requiring emergency power</b>	NYC
	<b>system.</b> With respect to such Occupancy Groups B, E	NYC
	and R-1, the following equipment, where such equip-	NYC
	ment is required by this code, shall be provided with	NYC
	an emergency power system:	NYC
	1. Exit signs and means of egress illumination	NYC
	required by Chapter 10;	NYC
	2. Elevator car lighting;	NYC
	3. Emergency voice/alarm communications sys-	NYC
	tems, including Fire Department in-building	NYC

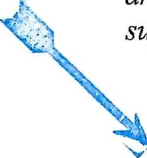


the following:

**(A) Primary Power Source.** All fire alarm circuits shall be provided with a primary power source. The primary power source shall be generated electric power not exceeding 277/480 volts, supplied by utility company power or isolated plant. The primary power supply to the fire alarm system shall comply with the following:

**(1) Primary Power Supply for the Fire Alarm System.** Primary power supply for the fire alarm system shall be connected to the primary power source ahead of all building service disconnecting means so that the building service disconnecting means can be opened without de-energizing the fire alarm supply. All utility metering of the fire alarm system, including disabling or removal of meters, shall maintain power continuity to the fire alarm system at all times.

**(2) Limited Interior Fire Alarm Systems.** Primary power supply for sub-systems or other limited interior fire alarm systems may be connected to the power supply through the protected area of such systems by means of a connection ahead of the disconnecting means for the power supply to the protected area.



FPN: Sub-systems and limited interior fire alarm systems may also use the connected means defined in paragraph (1) where available.

**(B) Secondary Power Source.** Where an emergency power system is provided or required to be provided for emergency system loads, the fire alarm circuits shall be provided with a secondary power source. Batteries shall not be a substitute for connection to a secondary power source. The secondary power source shall comply with the requirements for emergency power systems and/or emergency generator that are used for emergency systems loads as articulated below:

**(1) Generally.** Emergency power systems complying with Chapter 27 of the 2008 Building Code shall be permitted to serve as a secondary power source or

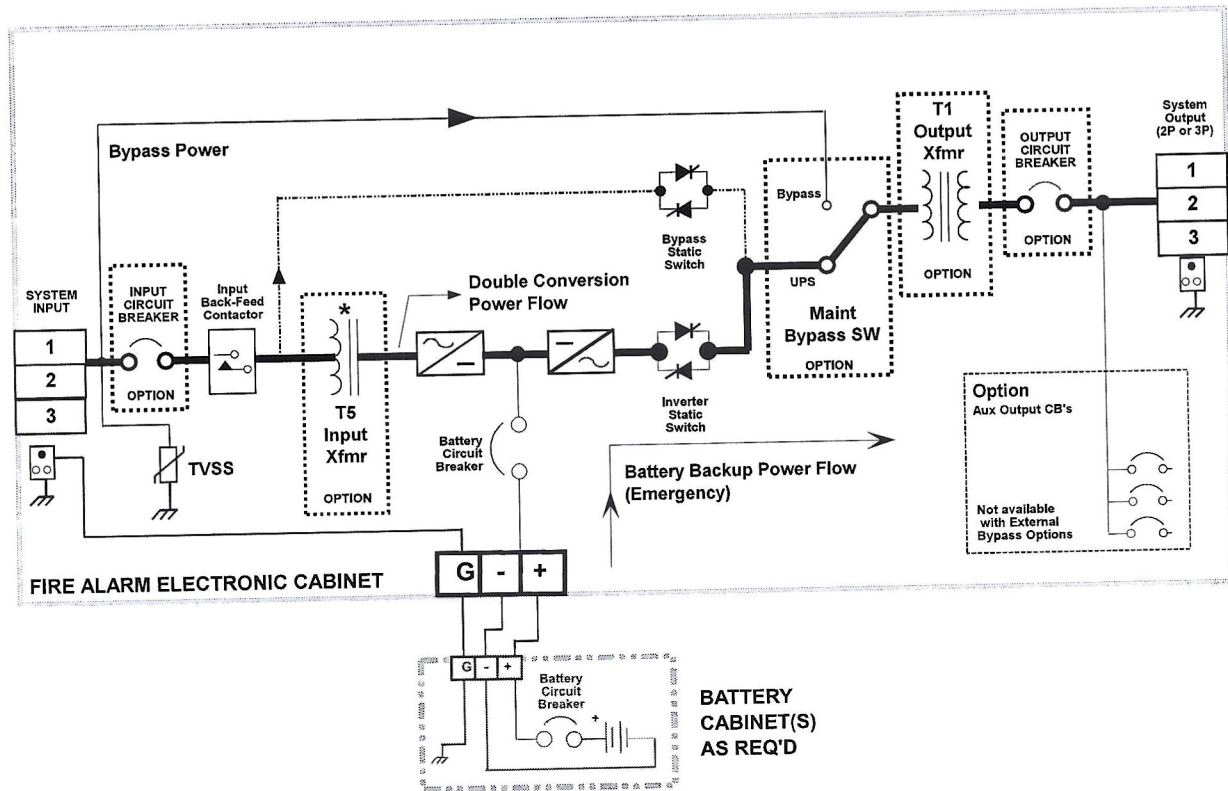
**(2) Existing Buildings.** Emergency power systems and/or emergency generators in existing buildings in compliance with Title 27, chapter 1, subchapter 6, section 27-396.4 of the Administrative Code (also referred to as the 1968 Building Code) shall be permitted to serve as the secondary power source.

The secondary power supply shall be connected such that all other disconnecting means serving other building emergency loads can be opened without de-energizing the facility fire alarm secondary power supply.

FPN: The use of a main disconnecting means on the output of the generator(s) is permitted where the disconnection of all other loads does not interrupt the facility fire alarm system secondary power supply.

**(C) Battery.** Regardless of whether a secondary power source is also provided, each fire alarm system and subsystem shall be equipped with a storage battery power supply sized to meet the

## FIRE ALARM BACKUP TYPICAL SINGLE LINE DIAGRAM



### NOTES:

1. \*Static Bypass and Manual Bypass:  
Will be powered from the transformer for different input and output voltage configurations.
2. Dotted blocks are optional features.



### TYPICAL FIRE ALARM BACKUP SINGLE LINE DIAGRAM

SDR: M.TANG 12/1/23  
APPVD: SHERRI 12/1/23  
CHKD: HAI 12/1/23

**DWG NO.:**  
**145-TD-010**

**REV.: B**  
SHT 1 OF 1

SUBJECT TO CHANGE WITHOUT NOTICE

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### 10.6.3 Power Supply Sources.

10.6.3.1 Power shall be supplied in accordance with either 10.6.3.2 or 10.6.4.

10.6.3.2 Unless configured in compliance with 10.6.4, at least two independent and reliable power supplies shall be provided, one primary and one secondary.

### 10.6.4 Uninterruptible Power Supplies (UPS).

10.6.4.1 The UPS device shall be configured in compliance with NFPA 111 for a Type O, Class 24, Level 1 system.

10.6.4.2 The UPS device shall comply with the requirements of 10.6.5.

10.6.4.3 Failure of the UPS shall result in the initiation of a trouble signal in accordance with Section 10.14.

For the 2019 edition, the section was revised to be titled Energy Storage Systems (ESS)

A.10.6.4 ESS classifications are found in NFPA 111. Previous editions of NFPA 72 referenced uninterruptible power supplies (UPS) systems, which is one type of an ESS.

For the 2022 edition, the section was retitled to Stored-Energy Emergency Power Supply Systems (SEPSS).

A.10.6.4 Emergency power supply systems (EPSS) containing engine-driven generators are found in NFPA 110 and stored-energy emergency



**3.3.6 Energy Conversion Equipment (ECE).** A system of either a UPS, a battery bank and battery charger (central battery system), or a rotating motor generator (with or without inertia flywheel) often supplied by a central battery system power source.

**3.3.7 Internal Ohmic Measurement.** A measurement of the electronic and ionic conduction path within a cell or unit, using techniques commonly known as impedance, conductance, or resistance tests.

### 3.3.8 Power Supply.

**3.3.8.1\* Emergency Power Supply (EPS).** The source of electric power of the required capacity and quality for an emergency power supply system (EPSS). [110, 2013]

**3.3.8.2\* Uninterruptible Power Supply (UPS).** A system consisting of a stored energy source, designed to continuously provide a clean, conditioned sinusoidal wave of power under normal conditions and for a finite period of time upon loss of the primary power source.

### 3.3.9 Transfer Switch.

**3.3.9.1 Automatic Transfer Switch (ATS).** Self-acting equipment for transferring the connected load from one power source to another power source. [110, 2013]

**3.3.9.2 Nonautomatic Transfer Switch.** A device, operated manually by a physical action or electrically by either a local or remote control, for transferring a common load between a normal and alternate supply. [110, 2013]

## Chapter 4 Classification of Stored Emergency Power Supply Systems (SEPSS)

**4.1\* General.** Stored emergency power supply systems (SEPSS) shall be classified as detailed in Sections 4.2 through 4.5.

### 4.2 Type.

**4.2.1** The type shall determine the maximum time, in seconds, that the SEPSS will permit the load terminals of the transfer switch to be without acceptable electrical power.

**4.2.2** The interruption time of the SEPSS types covered by this standard shall be as provided in Table 4.2.2.

Table 4.2.2 Types of SEPSS

Type	Interruption Time
Type O	No interruptions — UPS carrying load, 0 sec
Type U	UPS system with utility as preferred source
Type A	0.25 cycle: 0.0042 sec
Type B	1.0 cycle: 0.0167 sec
Type 10	10 sec
Type M	Manual stationary or nonautomatic — no time limit

**4.3\* Class.** The class shall determine the minimum time, in hours, for which the SEPSS is designed to operate at its rated load without being refueled or recharged as shown in Table 4.3.

**4.4 Category.** This standard shall regulate stored energy devices into the following two categories:

Table 4.3 Classes of SEPSS

Class	Reserve Time
Class 0.033	0.033 hr (2 min)
Class 0.083	0.083 hr (5 min)
Class 0.25	0.25 hr (15 min)
Class 1.5	1.5 hr (90 min)
Class X	Other time, in hours, as required by the application, code, or user

(1) Category A includes stored energy devices receiving their energy solely from the normal supply.

(2) Category B includes all devices not included in Category A and not specifically excluded elsewhere in this standard.

**4.5\* Level.** The level of equipment installation, performance, and maintenance shall be as specified in 4.5.1 through 4.5.5.

**4.5.1\* Level 1** systems shall be installed where failure of the equipment to perform could result in loss of human life or serious injuries.

**4.5.2\* Level 2** systems shall be installed where failure of the EPSS to perform is less critical to human life and safety.

**4.5.3** All equipment shall be permanently installed.

**4.5.4\* Level 1 and Level 2** SEPSS shall supply alternate power of a quality that ensures reliable operation of the load, within the time determined by the type and for a duration determined by the class.

**4.5.5** Other equipment and applications, including optional standby systems, not defined in Levels 1 and 2 are beyond the scope of this document.

## Chapter 5 Emergency Power Supply: Energy Sources, Convertors, Inverters, and Accessories

**5.1 Energy Sources.** The energy sources listed in this section shall be permitted for use for the emergency power supply (EPS).

### 5.1.1 Battery Systems.

**5.1.1.1 Battery Types.** Electrical storage batteries having a construction and chemical composition suitable for standby, float service operation shall consist of one of the following:

- (1) Lead-acid batteries (LA)
- (2) Nickel-cadmium batteries (Ni-Cd)
- (3) Nickel-metal hydride batteries (NiMH)
- (4) Lithium ion (LI) batteries

**5.1.1.2 Battery System Electrolyte.** The following batteries shall be permitted with either free-flowing or immobilized electrolyte:

- (1) LA
- (2) NiCd
- (3) NiMH

**5.1.1.3 Battery Installation.** Battery installations shall comply with the following:

- (1) Vented batteries (LA, Ni-Cd, NiMH) shall be installed in a room(s) dedicated to the batteries and associated equipment with approved ventilation.
- (2) Vented batteries shall be mounted on open racks.



- (2)\*Personnel who are certified by a nationally recognized certification organization acceptable to the authority having jurisdiction
- (3) Personnel who are employed and qualified by an organization listed by a nationally recognized testing laboratory for the design, installation, or servicing of systems within the scope of this chapter
- (4)\*Personnel who are employed and certified by an equipment manufacturer for the specific type of system

**10.5.6.4.3** Evidence of qualifications and/or certification shall be provided when requested by the authority having jurisdiction. A license or qualification listing shall be current in accordance with the requirements of the issuing authority or organization.

#### 10.6 Power Supplies.

**10.6.1 Scope.** The provisions of this section shall apply to power supplies used for protected premises fire alarm systems, supervising station alarm systems, public emergency alarm reporting systems, and emergency communications systems and equipment.

*Exception: Low-power radio (wireless) systems that comply with the requirements of Section 23.16.*

**10.6.2 Code Conformance.** All power supplies shall be installed in accordance with applicable requirements of NFPA 70.

#### 10.6.3 Power Supply Sources.

**10.6.3.1** Power shall be supplied in accordance with either 10.6.3.2 or 10.6.4.

**10.6.3.2** Unless configured in compliance with 10.6.4, at least two independent and reliable power supplies shall be provided, one primary and one secondary.

**10.6.3.3** Each power supply shall be of adequate capacity for the application.

**10.6.3.4** Monitoring the integrity of power supplies shall be in accordance with 10.6.9.

#### 10.6.4 Uninterruptible Power Supplies (UPS).

**10.6.4.1** The UPS device shall be configured in compliance with NFPA 111 for a Type O, Class 24, Level 1 system.

**10.6.4.2** The UPS device shall comply with the requirements of 10.6.5.

**10.6.4.3** Failure of the UPS shall result in the initiation of a trouble signal in accordance with Section 10.14.

#### 10.6.5 Primary Power Supply.

##### 10.6.5.1 Branch Circuit.

**10.6.5.1.1** The branch circuit supplying the fire alarm equipment(s) or emergency communication system(s) shall be supplied by one of the following:

- (1) Electric utility
- (2) An engine-driven generator or equivalent in accordance with 10.6.11.2, where a person trained in its operation is on duty at all times
- (3) An engine-driven generator or equivalent arranged for cogeneration with an electric utility in accordance with 10.6.11.2, where a person trained in its operation is on duty at all times

**10.6.5.1.2** The branch circuit supplying the fire alarm equipment or emergency communication system(s) shall supply no other loads.

##### 10.6.5.2 Circuit Identification and Accessibility.

**10.6.5.2.1** The location of the branch circuit disconnecting means shall be permanently identified at the control unit.

**10.6.5.2.2\*** The system circuit disconnecting means shall be permanently identified as to its purpose. Methods for marking shall be permitted to include, but not be limited to, one of the following:

- (1) "FIRE ALARM" for fire alarm systems
- (2) "EMERGENCY COMMUNICATIONS" for emergency communications systems
- (3) "FIRE ALARM/ECS" for combination fire alarm and emergency communications systems

**10.6.5.2.3** For fire alarm and/or signaling systems, the circuit disconnecting means shall have a red marking.

**10.6.5.2.4** The red marking shall not damage the overcurrent protective devices or obscure the manufacturer's markings.

**10.6.5.2.5** The circuit disconnecting means shall be accessible only to authorized personnel.

**10.6.5.3 Mechanical Protection.** The branch circuit(s) and connections shall be protected against physical damage.

**10.6.5.4 Circuit Breaker Lock.** Where a circuit breaker is the disconnecting means, an approved breaker locking device shall be installed.

**10.6.5.5 Overcurrent Protection.** An overcurrent protective device shall be provided in accordance with NFPA 70.

#### 10.6.6\* Continuity of Power Supplies.

**10.6.6.1** The secondary power supply shall automatically provide power to the protected premises system within 10 seconds whenever the primary power supply voltage is insufficient for required system operation.

**10.6.6.2** The secondary power supply shall automatically provide power to the supervising station facility and equipment within 60 seconds whenever the primary power supply voltage is insufficient for required system operation.

**10.6.6.3** Required signals shall not be lost, interrupted, or delayed by more than 10 seconds as a result of the primary power failure.

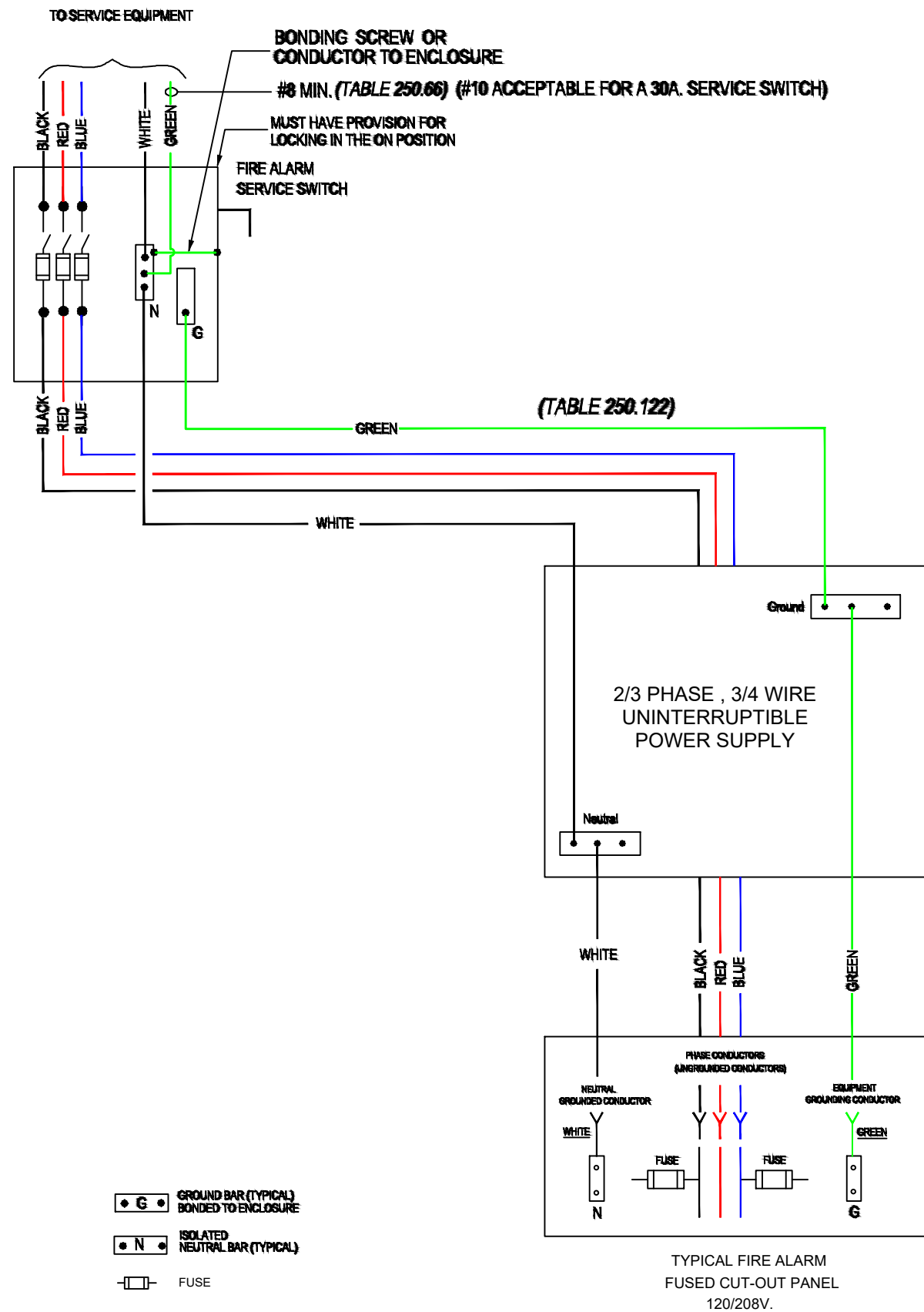
**10.6.6.3.1** Storage batteries dedicated to the system or UPS arranged in accordance with the provisions of NFPA 111 shall be permitted to supplement the secondary power supply to ensure required operation during the transfer period.

**10.6.6.3.2** Where a UPS is employed in 10.6.6.3.1, a positive means for disconnecting the input and output of the UPS system while maintaining continuity of power supply to the load shall be provided.

#### 10.6.7 Secondary Power Supply.

##### 10.6.7.1 Secondary Power Operation.

**10.6.7.1.1** Operation on secondary power shall not affect the required performance of a system or supervising station facility, including alarm, supervisory, and trouble signals and indications.



- ALL CONDUIT TO BE RMC, IMC OR MI CABLE. (760.46)
- ALL NPLFA DISTRIBUTION DEVICES AND PULL BOX COVERS MUST BE LABELED AND PAINTED RED.

UNINTERUPIBLE POWER SUPPLY  
120/208V 2/3 PHASE 3/4 WIRE SYSTEM

