Installation Manual

Wire Harness for the Battery Manager

AP9924, AP9925, AP9926, AP9927

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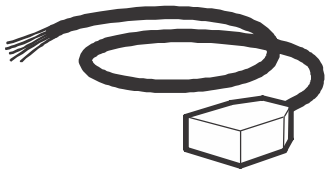

Schneider Electric

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Introduction

Overview

The Wire Harness for the Battery Manager connects the UPS batteries to the Battery Manager.

Each Battery Manager - *AP9922 Main Module* or *AP9922S Expansion Module* - can receive up to 2 wire harnesses. Each Wire Harness connects up to 32 batteries to the Battery Manager.

The first Wire Harness connects to the port labeled "**Battery/Power Input A**" on the back of the Battery Manager.

This Wire Harness will be relabeled *Wire Harness A*, and will:

- Connect the first 32 batteries on the string - batteries #1 to #32 - to the Battery Manager
- Connect the Battery Manager to its power source: the UPS charger.

The second Wire Harness connects to the port labeled "**Battery Input B**" on the back of the Battery Manager.

This Wire Harness will be relabeled *Wire Harness B*, and will:

- Connect the next 32 batteries on the string - batteries #33 to #64 - to the Battery Manager.

Depending on the length of the cables, there are 4 Wire Harness options:

- AP9924 - 5 ft length cable
- AP9925 - 25 ft length cable
- AP9926 - 50 ft length cable
- AP9927 - 100 ft length cable

Inventory

Item	Quantity
Wire Harness	1
Ring terminal assemblies	3
¾ A fuse (0W2237)	2
5 A fuse (0W2015)	38
4 in. wire tie for	
5 ft harness	20
25 ft harness	40
50 ft harness	80
100 ft harness	80

Item	Quantity
Tab washers	38
Male Faston® Connectors	5
Female Faston Connectors	37
8 in. wire tie for	
5 ft harness	20
25 ft harness	40
50 ft harness	40
100 ft harness	80

Important Safety Information

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **could result in** death or serious injury.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.

Failure to follow these instructions can result in equipment damage.

Please Note

Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Battery Safety

Batteries can present a risk of electric shock and high short-circuit current. The following precautions must be observed when working on batteries.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Battery circuit breakers must be installed according to the specifications and requirements as defined by Schneider Electric.
- Servicing of batteries must only be performed or supervised by qualified personnel knowledgeable of batteries and the required precautions. Keep unqualified personnel away from batteries.
- Disconnect charging source prior to connecting or disconnecting battery terminals.
- Do not dispose of batteries in a fire as they can explode.
- Do not open, alter, or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

Failure to follow these instructions will result in death or serious injury.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear protective glasses, gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect the charging source prior to connecting or disconnecting battery terminals.
- Determine if the battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electric shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).

Failure to follow these instructions will result in death or serious injury.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

When replacing batteries, always replace with the same type and number of batteries or battery packs.

Failure to follow these instructions will result in death or serious injury.

⚠ CAUTION

RISK OF EQUIPMENT DAMAGE

- Wait until the system is ready to be powered up before installing batteries in the system. The time duration from battery installation until the UPS system is powered up must not exceed 72 hours or 3 days.
- Batteries must not be stored more than six months due to the requirement of recharging. If the UPS system remains de-energized for a long period, we recommend that you energize the UPS system for a period of 24 hours at least once every month. This charges the batteries, thus avoiding irreversible damage.

Failure to follow these instructions can result in injury or equipment damage.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK

• Battery cabinets contain potentially lethal voltages.

• Batteries are energized even when AC power has been disconnected.

• All electrical equipment must be rated at appropriate voltage for system usage.

• Only qualified personnel trained in battery operation and safety may install the harnesses.

• Keep unauthorized personnel away from the batteries.

Failure to follow these instructions will result in death or serious injury.

Wire Harness for the Battery Manager - Safety Information for Installation:

- Cover the batteries with an insulating blanket before installing the harnesses.
- Wear safety glasses, rubber gloves, and rubber boots.
- Use double-insulated tools.
- Do not short-circuit the battery terminals; a short circuit could cause the batteries to explode.
- Do not lay tools or metal parts on top of the batteries or near the cable lugs.
- Remove watches, rings, and other metal objects.
- Use only cables supplied by Schneider Electric unless otherwise indicated.
- For the UPS and switch gear, use Lockout/Tagout safety procedures, which remove access to a device and physically label the device as intentionally out of service, before working on the batteries.

Pre-Installation

Lockout/Tagout the UPS & Disconnect Battery/Cabinet Breaker

Before installing the Wire Harness for the Battery Manager, use lockout and tagout safety procedures for the UPS or any attached equipment, such as high-voltage power supplies.

If possible, disconnect the main output lead from the battery string to the load.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear protective glasses, gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect the charging source prior to connecting or disconnecting battery terminals.
- Determine if the battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electric shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

RISK OF EQUIPMENT DAMAGE

Wait until the system is ready to be powered up before connecting batteries in the system. The time duration from battery connection until the UPS system is powered up must not exceed 72 hours.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Determine the Battery String and Battery Number Configuration

The system configuration for the Battery Manager depends on the type of UPS connected to the battery bank.

A Delta Conversion UPS (or Double Conversion UPS with split string configuration) has a different battery configuration than the more common Double Conversion UPS. With a Delta Conversion UPS (or Double Conversion UPS with split string configuration), the battery string is split into two half strings: a positive string - the first half of batteries - and a negative string - the second half of batteries.

The two half strings are of identical length and ampacity.For the Battery Manager configuration and installation, the positive string and the negative string are treated as two independent strings of batteries.

Example: A configuration of 128 nominal 4V lead-acid batteries are in a string. Using a voltmeter to check polarity, determine the most positive battery in your string (Battery 1) and count to the most negative (last) battery in your string.

A representation of the battery string and battery number configuration with a Double Conversion UPS and a Delta Conversion UPS (or Double Conversion UPS with split string configuration) are provided in the section, beginning on page 18.

Installation

Power Connections

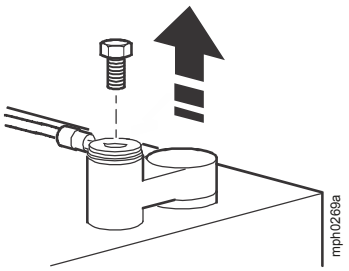
Install Tab Washer

1. For each Battery Manager Module - *AP9922 Main Module* or *AP9922S Expansion Module*, install a Tab Washer onto the *positive* terminal of the first battery on the string and onto the *negative* terminal of the last battery on the string.

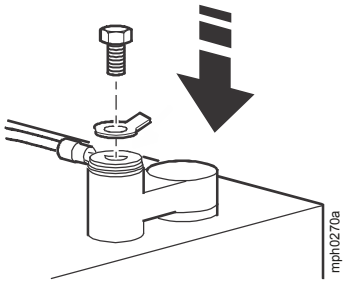
   Example: if a string of 128 batteries is managed by two Battery Manager Modules - one *AP9922 Main Module* and one *AP9922S Expansion Module*, two tab washers must be installed onto the *positive* terminal of battery #1 and two tab washers must be installed onto the *negative* terminal of battery #128.

   NOTE: Within Battery Diagrams, see “Double Conversion UPS” on page 19 and “Delta Conversion UPS (or Double Conversion UPS with split string configuration)” on page 21 for more information.

   - **Non-embedded Battery Terminals:** Secure each set of tab washers in place with a nut (not provided in hardware package).
   - **Embedded Battery Terminals:** Remove the bolt from the battery terminal.

   Place the tab washer on the existing battery connection, directly under the hex-head of the bolt.

   Re-insert the bolt and adjust torque according to the specifications.

   ⚠ ⚠ DANGER

   HAZARD OF ELECTRIC SHOCK

   Verify that the string is an open circuit before working with the batteries.

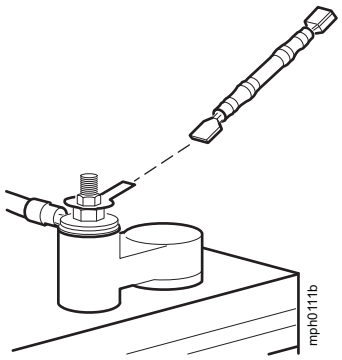
   Failure to follow these instructions will result in death or serious injury.

2. Coat the tab washers and nuts with approved antioxidant grease.

   NOTE: Grease specifications vary. Use battery manufacturer approved grease.

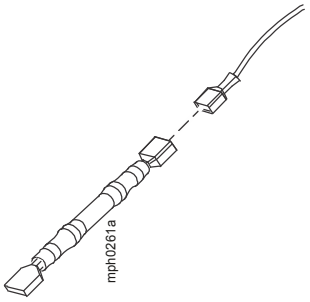
Install ¾ A fuse

- Attach one ¾ A fuse (the black fuse provided in the hardware package) to each tab washer. Slide the receptor end of the fuse over the tab portion of the tab washer.



Connect Power Wires to ¾ A fuses

1. Choose the location where the Battery Manager will be installed. Do not connect the wire harness to the Battery Manager yet. The connection will be done in a later step.
2. Measure required length of wire #34 of **Wire Harness A** (*positive* power wire). **Wire Harness A Connector** must reach from the *positive* terminal of the first battery on the string to the battery Connector port on the back of the Battery Manager. Add a 'service loop' that will permit one repair of the wire without having to replace it.
3. Measure required length of wire #35 of **Wire Harness A** (*negative* power wire). **Wire Harness A Connector** must reach from the *negative* terminal of the last battery on the string to the battery Connector port on the back of the Battery Manager. Add a 'service loop' that will permit one repair of the wire without having to replace it.
4. Cut wires #34 and #35 of **Wire Harness A** to the required lengths measured in the previous step. Reattach the wire labels to the wire ends.
5. Attach a Female Faston Connector to the wire #34 and #35 ends, and crimp them securely.
6. Connect wire #34 of **Wire Harness A** to the 3/4 A fuse on the *positive* terminal of the first battery on the string.
7. Connect wire #35 of **Wire Harness A** to the 3/4 A fuse on the *negative* terminal of the last battery on the string.



NOTE: For each Battery Manager Module - AP9922 or AP9922S, power connection wires are wires #34 and #35 of Wire Harness A. Wires #34 and #35 of Wire Harness B are not used and should be removed from Wire Harness B Connector. See “Wire Harness Connector Pinouts” on page 10.

Battery Connections

Install Tab Washer

1. Install a tab washer onto the positive terminal of all batteries on the string.
   - **Non-embedded Battery Terminals:** secure each set of tab washers in place with a nut (not provided in hardware package).
   - **Embedded Battery Terminals:** remove the bolt from the battery terminal. Place the tab washer on the existing battery connection, directly under the hex-head of the bolt. Reinsert the bolt and adjust torque according to the specifications.
2. Install a tab washer on the *negative* terminal of:
   - The last battery on the string.
   - Every 32nd battery on the string - battery #32, #64, #96, etc...

     Example: If a string of 128 batteries is managed by two Battery Manager Modules, **one AP9922 Main Module** and **one AP9922S Expansion Module**:
     – One tab washer must be installed on the *positive* terminal of all 128 batteries.
     – One tab washer must be installed on the *negative* terminal of batteries #32, #64, #96 and #128.
     NOTE: Within Battery Diagrams, see “Double Conversion UPS” on page 19 and “Delta Conversion UPS (or Double Conversion UPS with split string configuration)” on page 21 for more information.
3. Coat the tab washers and nuts with approved antioxidant grease.
   NOTE: Grease specifications vary. Use battery manufacturer approved grease.

Install 5A fuses

- Attach one 5A fuse (the yellow fuse provided in the hardware package) to each tab washer. Slide the receptor end of the fuse over the tab portion of the tab washer.

Connect Battery Wires to 5A fuses

1. Choose the physical location where the Battery Manager will be installed. Do not connect the Battery Manager yet. The connection will be done in a later step.

   NOTE: If you started with the Power Connection wiring, the physical location of the Battery Manager has already been chosen and should remain the same.
2. Measure required length of wires #1 to #33 of the wire harness. The Wire Harness Connector must reach from corresponding battery terminal to the battery Connector port on back of the Battery Manager. Add a 'service loop' permitting repair of the wire without having to replace it.

   Example: if a string of 128 batteries is managed by two Battery Manager Modules - **one AP9922 Main Module** and **one AP9922S Expansion Module**:
   – Wires #1 to #32 of **Wire Harness A** of Battery Manager AP9922 connects to the positive terminal of batteries #1 to #32. Wire #33 connects to the *negative* terminal of battery #32.
   – Wires #1 to #32 of **Wire Harness B** of Battery Manager AP9922 connects to the *positive* terminal of batteries #33 to #64. Wire #33 connects to the *negative* terminal of battery #64.
   – Wires #1 to #32 of **Wire Harness A** of Battery Manager AP9922S connects to the *positive* terminal of batteries #65 to #96. Wire #33 connects to the *negative* terminal of battery #96.
   – Wires #1 to #32 of **Wire Harness B** of Battery Manager AP9922S connects to the *positive* terminal of batteries #97 to #128. Wire #33 connects to the *negative* terminal of battery #128.
3. Cut wires #1 to #33 to the required lengths measured in the previous step. Reattach the wire labels to the wire ends.
   NOTE: if some wires are not used on the wire harness, remove those non-used wires from the Wire Harness Connector.
4. Attach a Female Faston Connector to the wire #1 to #33 ends, and crimp them securely.
5. Connect wires to the 5A fuses on the corresponding battery terminals.

Verify Power and Battery Connections

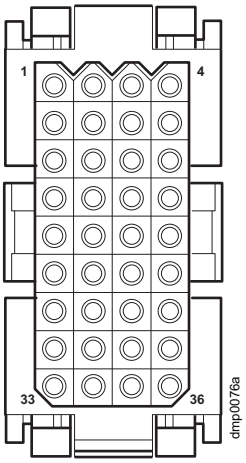
Overview of Wire Harness Connector

Before connecting the Wire Harness to the Battery Manager, you must check the Wire Harness connections are correct. In order to do that, you must check the voltages at the wire Connector pin-outs using a voltmeter.

As shown, the Wire Harness Connector has 9 rows with 4 pins on each row.

The pin number - or battery wire number - sequence is left to right.

NOTE: See the “Wire Harness Connector Pinouts” on page 10 for more information.



Wire Harness Connector Pinouts

Battery Connector A		Battery Connector B	
Pin # / Wire #	Battery number and polarity	Pin # / Wire #	Battery number and polarity
1	Battery 1 +	1	Battery 33 +
2	Battery 1 - and Battery 2 +	2	Battery 33 - and Battery 34 +
3	Battery 2 - and Battery 3 +	3	Battery 34 - and Battery 35 +
4	Battery 3 - and Battery 4 +	4	Battery 35 - and Battery 36 +
5	Battery 4 - and Battery 5 +	5	Battery 36 - and Battery 37 +
6	Battery 5 - and Battery 6 +	6	Battery 37 - and Battery 38 +
7	Battery 6 - and Battery 7 +	7	Battery 38 - and Battery 39 +
8	Battery 7 - and Battery 8 +	8	Battery 39 - and Battery 40 +
9	Battery 8 - and Battery 9 +	9	Battery 40 - and Battery 41 +
10	Battery 9 - and Battery 10 +	10	Battery 41 - and Battery 42 +
11	Battery 10 - and Battery 11 +	11	Battery 42 - and Battery 43 +
12	Battery 11 - and Battery 12 +	12	Battery 43 - and Battery 44 +
13	Battery 12 - and Battery 13 +	13	Battery 44 - and Battery 45 +
14	Battery 13 - and Battery 14 +	14	Battery 45 - and Battery 46 +
15	Battery 14 - and Battery 15 +	15	Battery 46 - and Battery 47 +
16	Battery 15 - and Battery 16 +	16	Battery 47 - and Battery 48 +
17	Battery 16 - and Battery 17 +	17	Battery 48 - and Battery 49 +
18	Battery 17 - and Battery 18 +	18	Battery 49 - and Battery 50 +
19	Battery 18 - and Battery 19 +	19	Battery 50 - and Battery 51 +
20	Battery 19 - and Battery 20 +	20	Battery 51 - and Battery 52 +
21	Battery 20 - and Battery 21 +	21	Battery 52 - and Battery 53 +
22	Battery 21 - and Battery 22 +	22	Battery 53 - and Battery 54 +
23	Battery 22 - and Battery 23 +	23	Battery 54 - and Battery 55 +
24	Battery 23 - and Battery 24 +	24	Battery 55 - and Battery 56 +
25	Battery 24 - and Battery 25 +	25	Battery 56 - and Battery 57 +
26	Battery 25 - and Battery 26 +	26	Battery 57 - and Battery 58 +
27	Battery 26 - and Battery 27 +	27	Battery 58 - and Battery 59 +
28	Battery 27 - and Battery 28 +	28	Battery 59 - and Battery 60 +
29	Battery 28 - and Battery 29 +	29	Battery 60 - and Battery 61 +
30	Battery 29 - and Battery 30 +	30	Battery 61 - and Battery 62 +
31	Battery 30 - and Battery 31 +	31	Battery 62 - and Battery 63 +
32	Battery 31 - and Battery 32 +	32	Battery 63 - and Battery 64 +
33	Battery 32 -	33	Battery 64 -
34	75–560 VDC power from (+) of first battery in first string.	34	Do not use. Remove wire from Connector.
35	75–560 VDC power from (-) of last battery in first string.	35	Do not use. Remove wire from Connector.
36	N/A. No wire connected to pin-out.	36	N/A. No wire connected to pin-out.

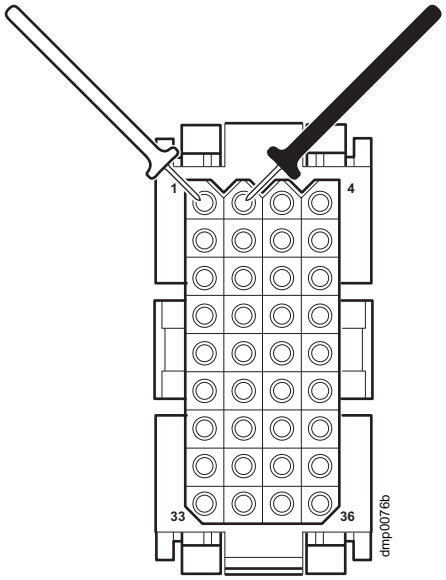
Check Battery Connections

Each Wire Harness connects 32 batteries to the Battery Manager. If a string of batteries contains more than 32 batteries, multiple wire harnesses are required.

For each wire harness, first check the battery connections, by following *step a and step b* below.

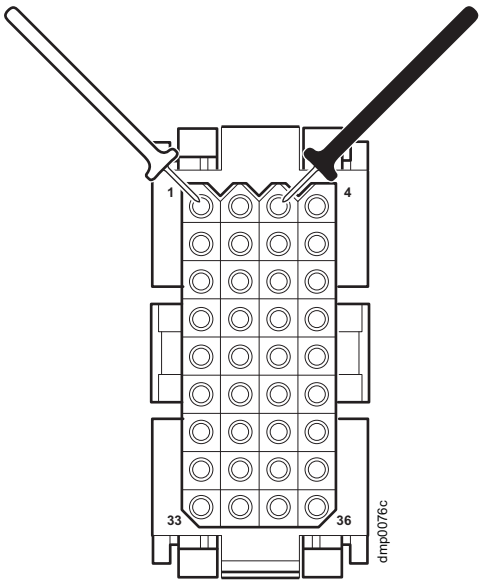
Next, check the battery connections between wire harnesses. Depending on the system configuration, continue following either “Case 1: 64 or fewer batteries on the string” on page 12, or “Case 2: More than 64 batteries on the string” on page 13.

a. Place the *positive* lead of the voltmeter in pin 1 of the Wire Harness Connector. Place the *negative* lead of the voltmeter in pin 2. The voltage reading should match the voltage of the battery-type installed.



Wire Harness Connector A

b. Keep the *positive* lead of the voltmeter in pin 1. Place the *negative* lead of the voltmeter in pin 3, then pin 4, etc... until the last pin used on the Connector. The voltage reading should increase every time by the voltage of the battery-type installed.



Wire Harness Connector A

Case 1: 64 or fewer batteries on the string.

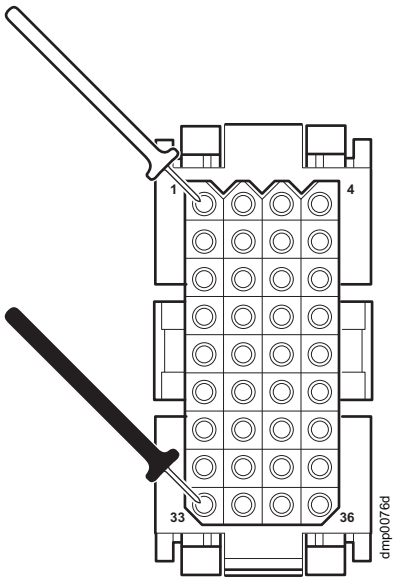
One Main Module AP9922 will be connected to the batteries with two wire harnesses:

- Wire Harness A - batteries #1 to #32
- Wire Harness B - batteries #33 up to #64.

Follow *step a and step b* on page 11 for Wire Harness A and B. Then, the following battery connections between wire harnesses must be checked.

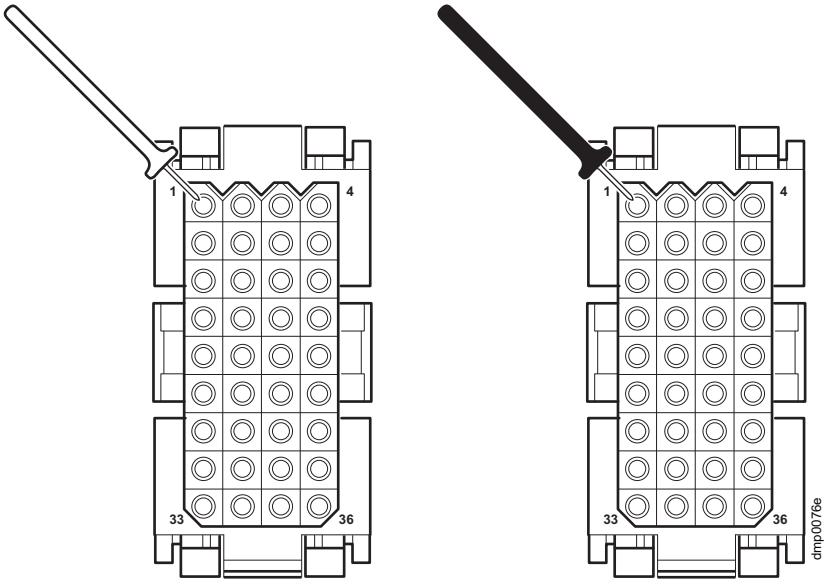
NOTE: If the batteries and the wire harnesses are wired correctly, the voltages will be equal.

c. Place the *positive* lead of the voltmeter in pin 1 of the Wire Harness Connector A. Place the *negative* lead of the voltmeter in pin 33 of Wire Harness Connector A. Record the reported voltage.



Wire Harness Connector A

d. Leave *positive* lead of the voltmeter in pin 1 of Wire Harness Connector A. Place the *negative* lead of the voltmeter in pin 1 of Wire Harness Connector B. Record the reported voltage.



Wire Harness Connector A **Wire Harness Connector B**

NOTE: If the voltages reported in both cases are not equal, there is a wiring error. Inspect the batteries and Wire Harness connections.

Case 2: More than 64 batteries on the string.

The Main Module AP9922 is connected in series with one (or more) Expansion Module(s) AP9922S. Each Expansion Module receives one or two wire harnesses, depending on the number of batteries on the string.

Follow *step a and step b* on page 11 for each wire harness. Then, check the following battery connections between the specified wire harnesses.

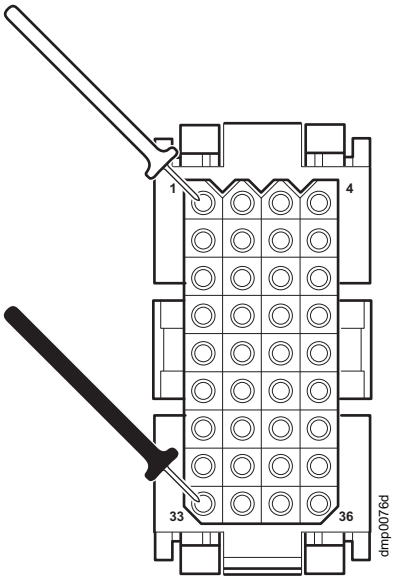
Between the Wire Harness A of AP9922 and Wire Harness B of AP9922.

NOTE: If the batteries and the wire harnesses are wired correctly, the voltages will be equal.

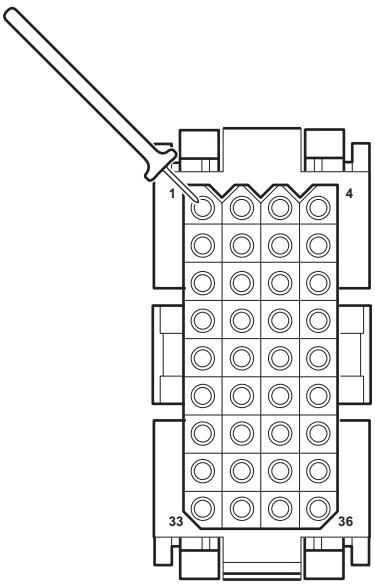
c. Place the *positive* lead of the voltmeter into pin 1 of the Wire Harness Connector A of Module AP9922.

   Place the *negative* lead of the voltmeter in pin 33 of Wire Harness Connector A of Module AP9922.

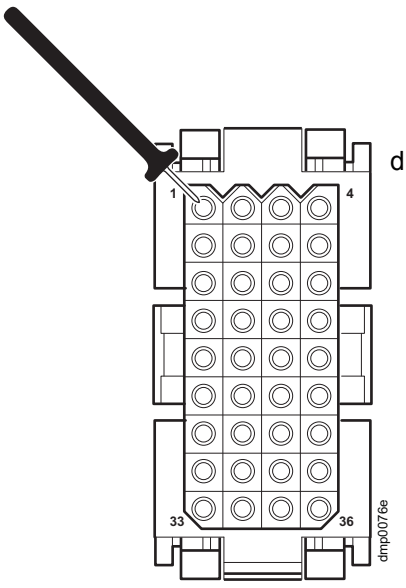
   Record the reported voltage.



Wire Harness Connector A of AP9922



Wire Harness Connector A of AP9922



Wire Harness Connector B of AP9922

d. Leave *positive* lead of the voltmeter in pin 1 of Wire Harness Connector A of Module AP9922.

   Place the *negative* lead of the voltmeter in pin 1 of Wire Harness Connector B of Module AP9922.

   Record the reported voltage.

NOTE: If the voltages reported in both cases are not equal, there is a wiring error. Inspect the batteries and Wire Harness connections.

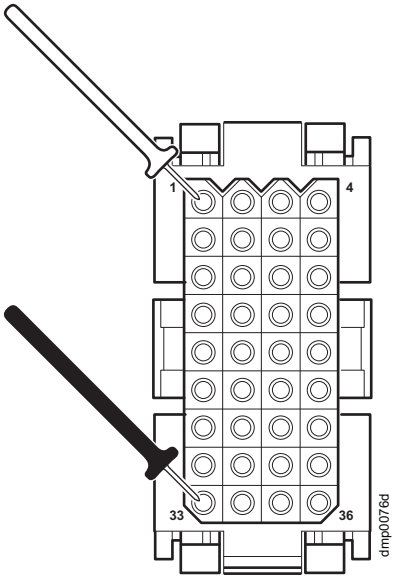
Between Wire Harness B of AP9922 and Wire Harness A of AP9922S.

NOTE: If the batteries and the wire harnesses are wired correctly, the voltages will be equal.

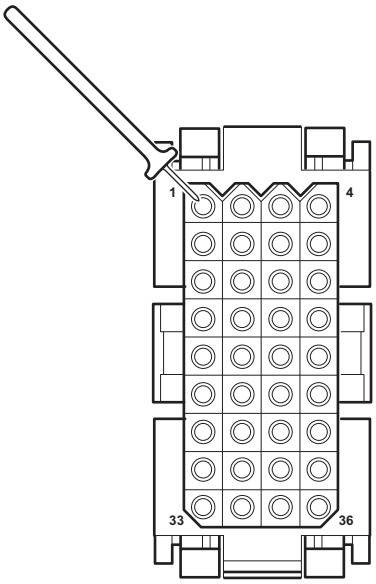
e. Place the *positive* lead of the voltmeter into pin 1 of the Wire Harness Connector B of Module AP9922.

   Place the *negative* lead of the voltmeter in pin 33 of Wire Harness Connector B of Module AP9922.

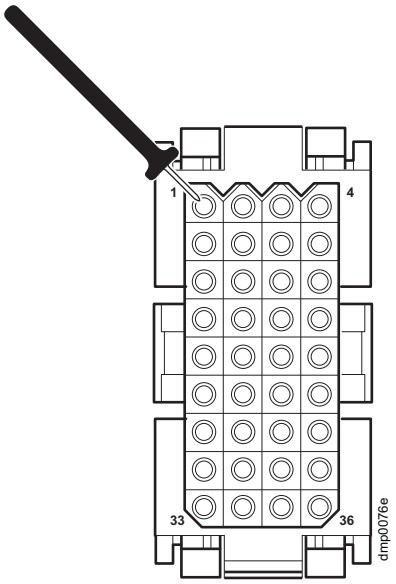
   Record the reported voltage.



Wire Harness Connector B of AP9922



Wire Harness Connector B of AP9922



Wire Harness Connector A of AP9922S

f. Leave *positive* lead of the voltmeter in pin 1 of Wire Harness Connector B of Module AP9922.

   Place the *negative* lead of the voltmeter in pin 1 of Wire Harness Connector A of Module AP9922S.

   Record the reported voltage.

NOTE: If the voltages reported in both cases are not equal, there is a wiring error. Inspect the batteries and Wire Harness connections.

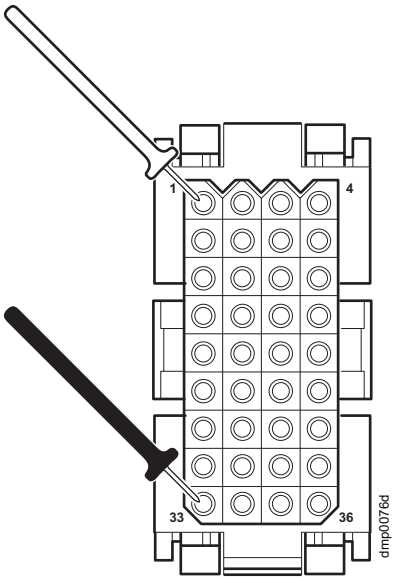
Between Wire Harness A of AP9922S and Wire Harness B of AP9922S.

NOTE: If the batteries and the wire harnesses are wired correctly, the voltages will be equal.

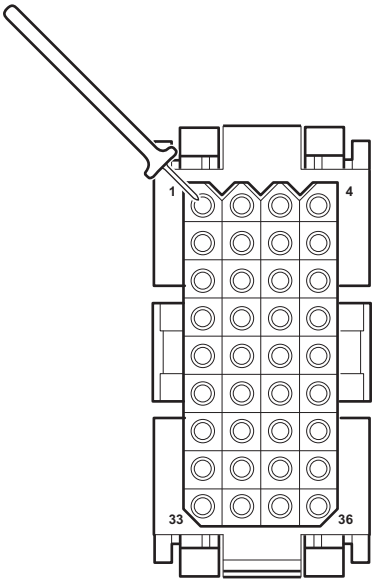
g. Place the *positive* lead of the voltmeter into pin 1 of the Wire Harness Connector A of Module AP9922S.

   Place the *negative* lead of the voltmeter in pin 33 of Wire Harness Connector A of Module AP9922S.

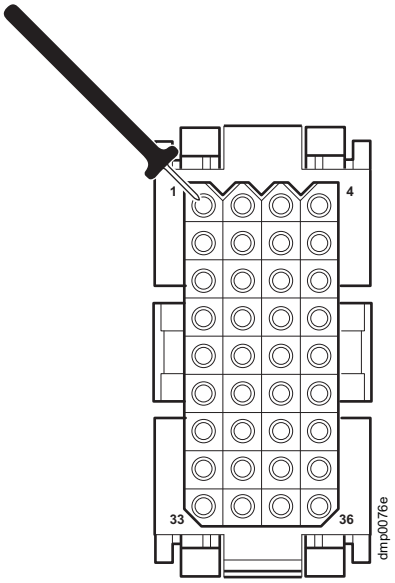
   Record the reported voltage.



Wire Harness Connector A of AP9922S



Wire Harness Connector A of AP9922S



Wire Harness Connector B of AP9922S

h. Leave *positive* lead of the voltmeter in pin 1 of Wire Harness Connector A of Module AP9922S.

   Place the *negative* lead of the voltmeter in pin 1 of Wire Harness Connector B of Module AP9922S.

   Record the reported voltage.

NOTE: If the voltages reported in both cases are not equal, there is a wiring error. Inspect the batteries and Wire Harness connections.

Check Power Connections

Each Battery Manager is powered by the charger of the UPS. The power connections are on pin #34 and pin #35 of Wire Harness Connector A.

a. Place the *positive* lead in pin #34 and the *negative* lead of the voltmeter in pin #35 of Wire Harness Connector A. Record the reported voltage.
   NOTE: The voltage should match the total voltage of the entire UPS battery string.

If multiple Battery Managers are used, repeat the same action for each Battery Manager Module.

NOTE: The reported voltages for each Battery Manager should be equal.

Secure the Wire Harness

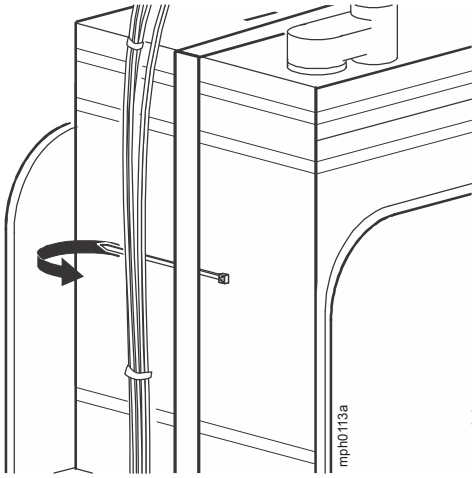
⚠ WARNING
PERSONAL INJURY HAZARD
Secure the harness to the rack or cabinet to prevent damage to the wires and to prevent personal injury by tripping.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Secure the Battery and Power Wires

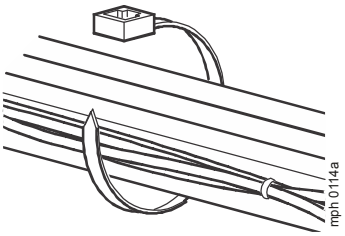
After the Wire Harness has been connected to the batteries, secure its wires.

1. Using the 4 in. wire ties, attach the battery wires to the battery straps.

   NOTE: Attaching the wires too tightly could damage their insulation.



- Using the 8 in. wire ties, secure the harness to the enclosure to prevent wire damage.



Connect the Wire Harness to the Battery Manager

Install the Battery Manager

Install the Battery Manager in a battery cabinet, in a rack or enclosure, or on top of the battery cabinet. The system must be installed in a location that is safe, convenient, and accessible for connection procedures.

For instructions and safety information on installing the Battery Manager (AP9922 and AP9922S), see the *Battery Manager Installation Manual* (990-1649F-001), included with your Battery Manager and available on the Schneider Electric website, **www.schneider-electric.com**.

Connect the Wire Harness

1. Verify completion of the following:
   a. “Power Connections” on page 6.
   b. “Battery Connections” on page 8.
   c. “Verify Power and Battery Connections” on page 9.
   d. “Secure the Wire Harness” on page 16.
2. Check that the Power Button on the front panel of the Battery Manager is set to **OFF**.

⚠ CAUTION
RISK OF EQUIPMENT DAMAGE The power ON/OFF button must be in the OFF position on all equipment before connecting or plugging in any equipment. **Failure to follow these instructions can result in injury or equipment damage.**

3. Connect **Wire Harness A** to the connector port titled “Battery/Power Input A” on the back of the Battery Manager.

   NOTE: Wire Harness A is the Wire Harness that has the power connections (wires #34 and #35) and battery connections.
4. Connect **Wire Harness B** to the connector port titled “Battery Input B” on the back of the Battery Manager.

   NOTE: Wire Harness B is the Wire Harness with battery connections ONLY. No wire #34 or #35 is connected to the connector.

   See “Overview” on page 1 and “Wire Harness Connector Pinouts” on page 10 for more information.

Battery Maintenance

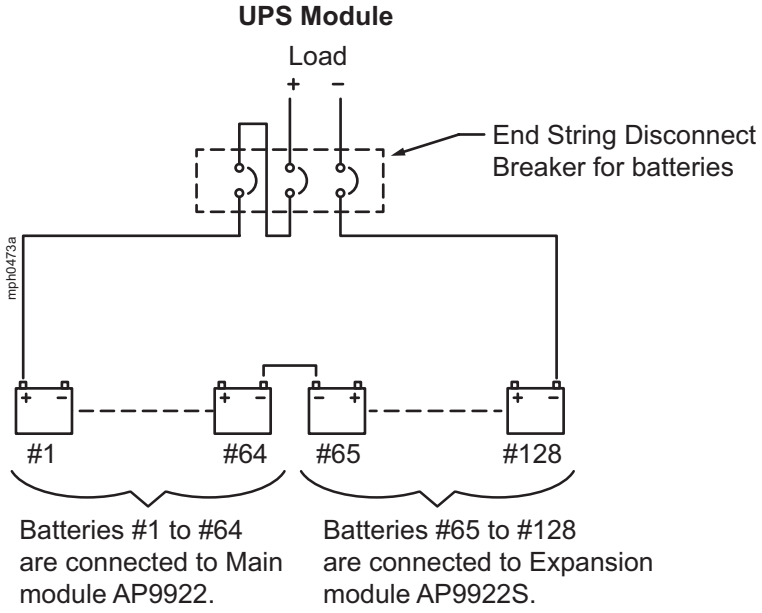
Before proceeding with any maintenance operation on the batteries or battery connections, the Battery Managers must be powered off.

⚠ CAUTION
RISK OF EQUIPMENT DAMAGE The power ON/OFF button on the front panel of the Battery Manager must be in the OFF position before connecting or plugging in any equipment. **Failure to follow these instructions can result in injury or equipment damage.**

Battery Diagrams

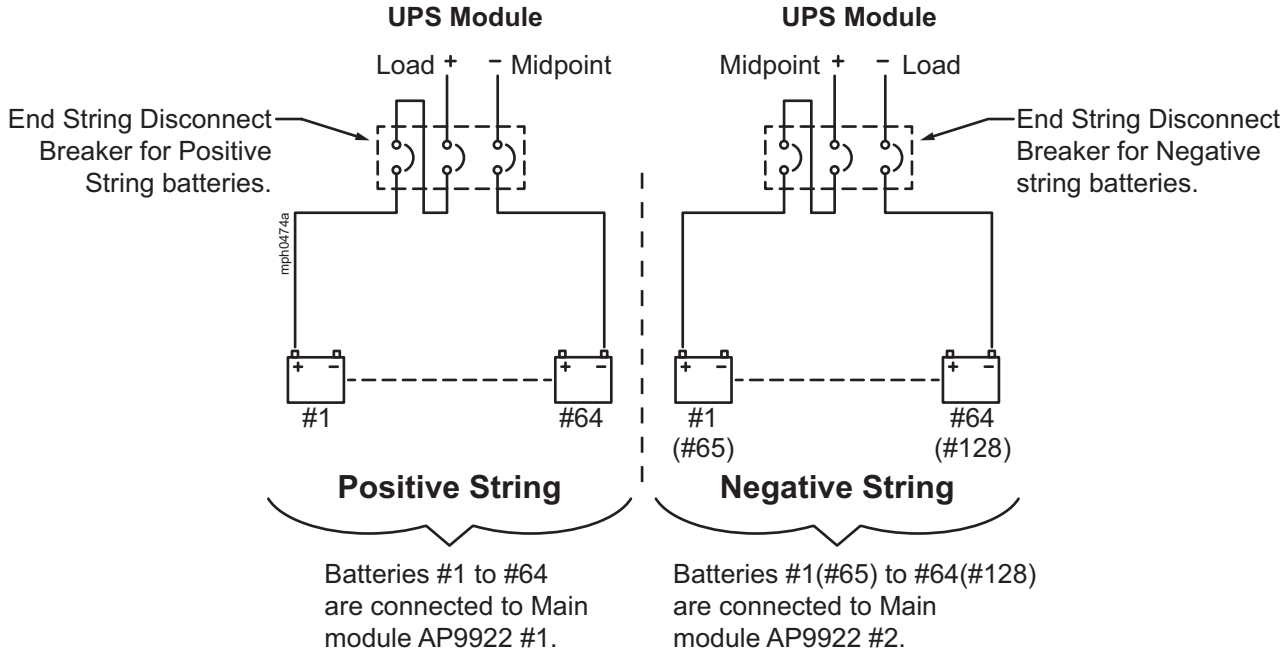
Double Conversion UPS

NOTE: See the wiring diagram “Double Conversion UPS,” beginning on page 19.



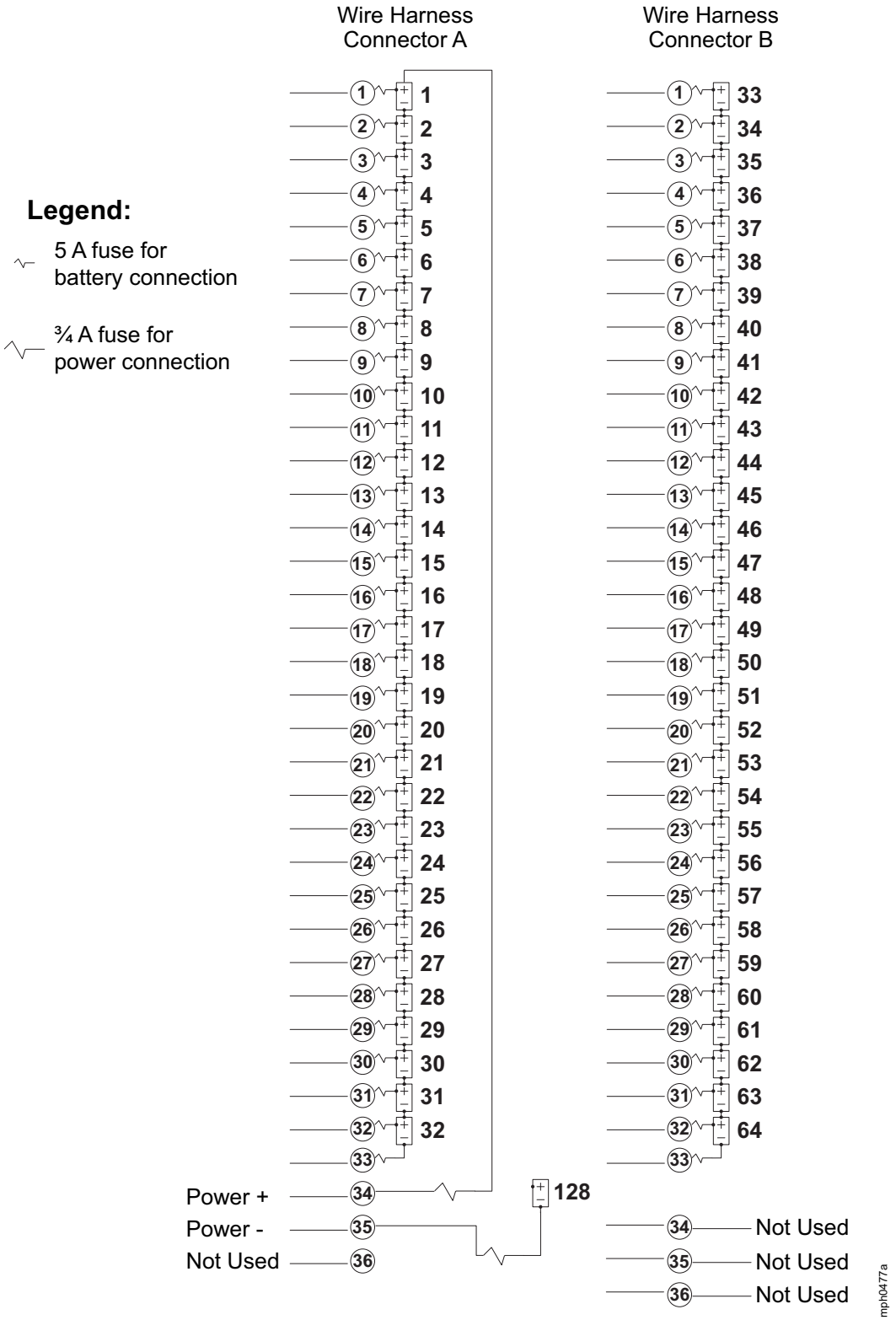
Delta Conversion UPS (or Double Conversion UPS with split string configuration)

NOTE: See the wiring diagram “Delta Conversion UPS (or Double Conversion UPS with split string configuration),” beginning on page 21.



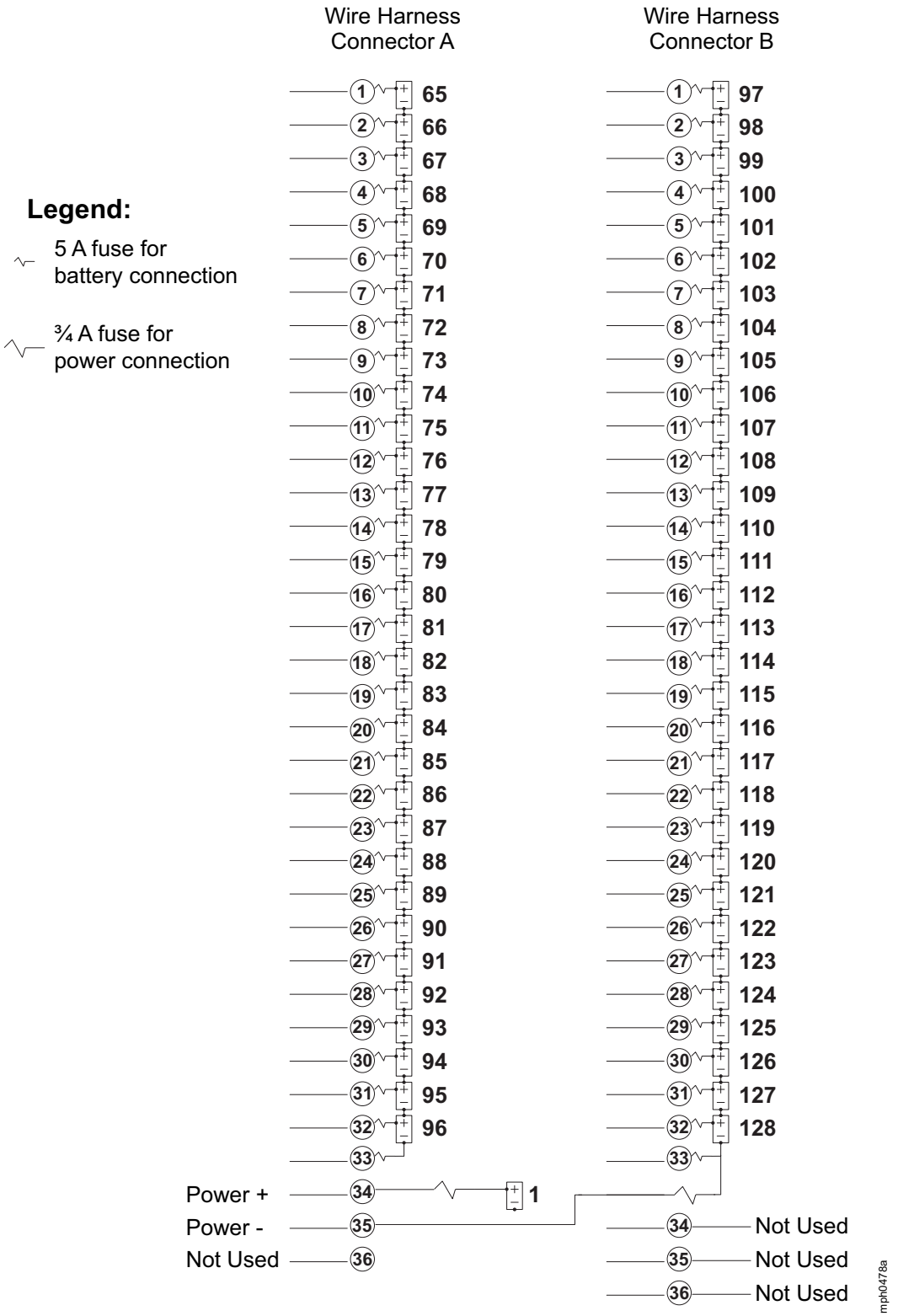
Double Conversion UPS

Main module AP9922



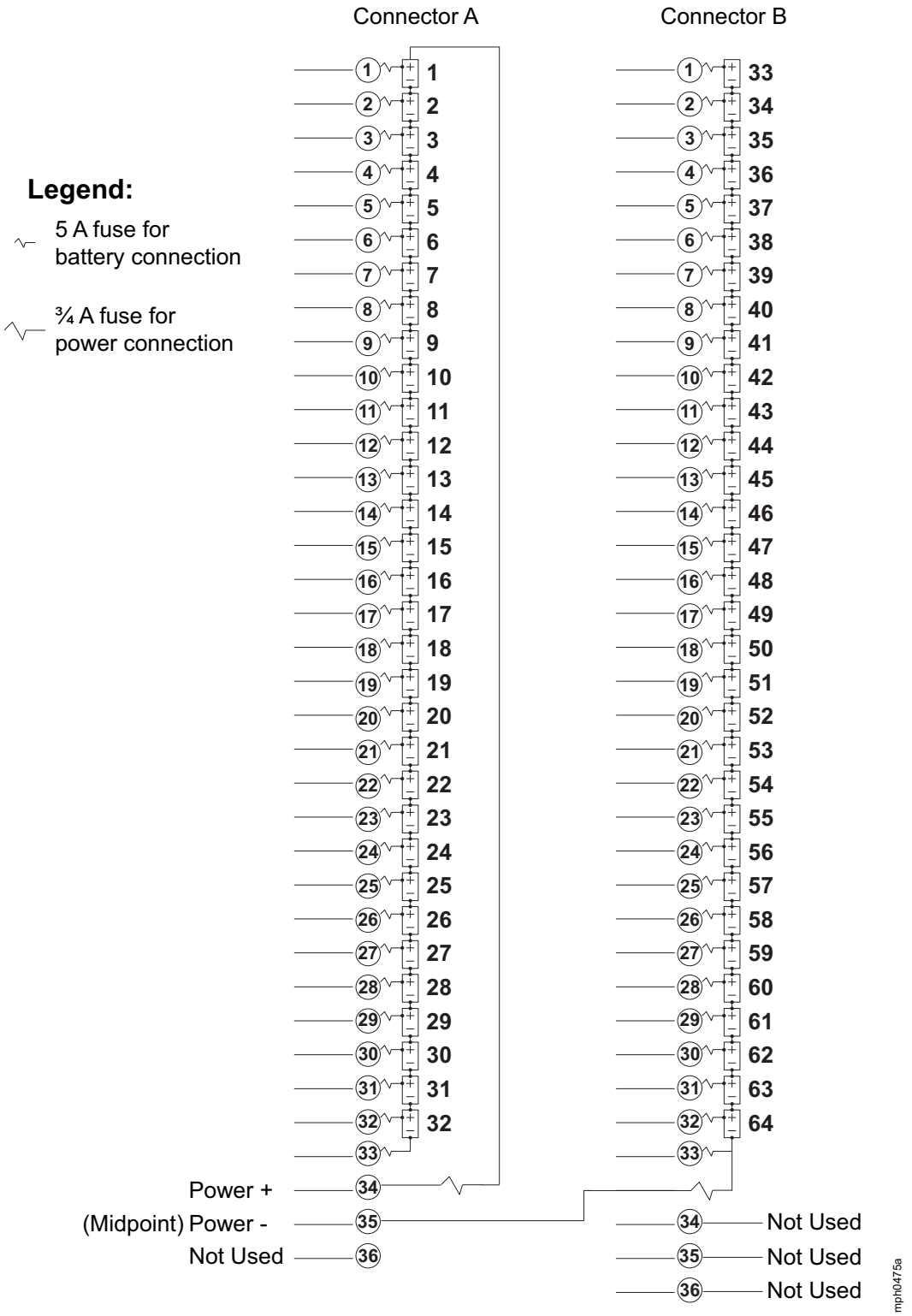
Double Conversion UPS

Expansion module AP9922S



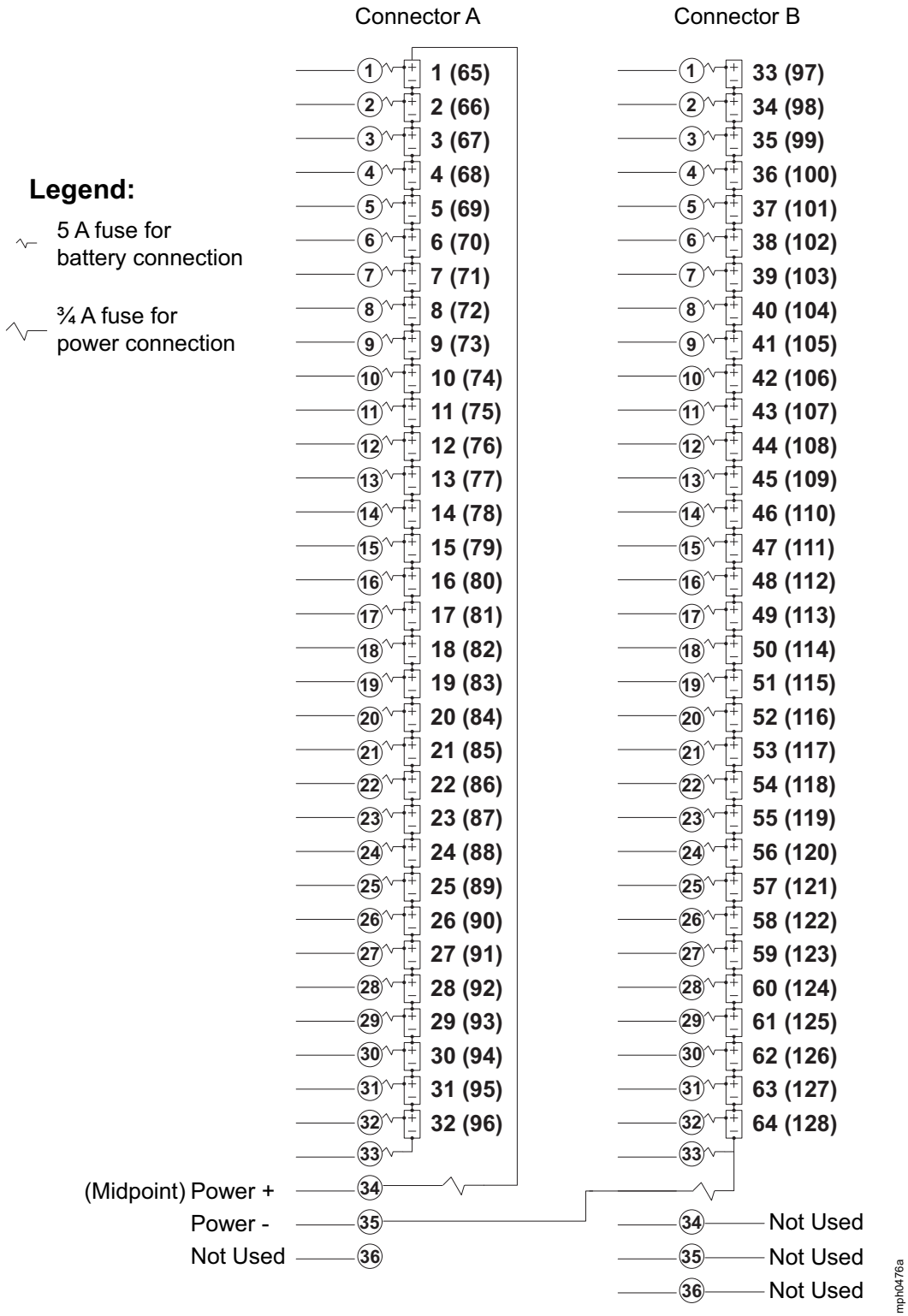
Delta Conversion UPS (or Double Conversion UPS with split string configuration)

Positive String - Main module AP9922 #1



Delta Conversion UPS (or Double Conversion UPS with split string configuration)

Negative String - Main module AP9922 #2



Worldwide Customer Support

Customer support for this product is available at **www.schneider-electric.com**.

990-1813E-001 **12/2015**