



AMPINERGY™ MODULAR POWER DISTRIBUTION SYSTEM

Consultant's / Specifier's Materials



AMPINNERGY –

Overview

- AMPINNERGY – In a Nutshell...
- Power System Features
- Common Power System Configurations
- Supported Wiring Methods
- Required Power System Components
- Electrical Codes & Agency Specifications
- Additional Information and Resources

AMPINNERGY –

In a Nutshell...

- Tyco Electronics AMPINNERGY Modular Power Distribution System is a multi-circuit power distribution system that provides a feature-rich, flexible, and modular alternative to traditional hard wiring.
- AMPINNERGY simplifies installation and reduces labor time by up to 70% as compared to hard wiring.
 - A cost comparison using RS Means data is available at <http://www.ampnetconnect.com>
- AMPINNERGY uses an oversized neutral for enhanced power quality.
- AMPINNERGY system components are:
 - UL Listed,
 - Compliant with the National Electrical Code (NEC),
 - CSA Certified, and
 - Compliant with the Canadian Electrical Code (CEC).
- AMPINNERGY allows for easier field changes to accommodate new power configuration or load balancing requirements ...

AMPINNERGY –

In a Nutshell...

*Making changes is as easy
as 1,2,3...*

- ✓ *Step 1* = Turn power OFF, disconnect the AFWM, PDM, Junction Box, or Power Strip from the Cable Assemblies
- ✓ *Step 2* = Relocate the AFWM, PDM, Junction Box, Power Strip and Cable Assemblies
- ✓ *Step 3* = Reconnect the AFWM, PDM, Junction Box, or Power Strip to the Cable Assemblies, and Turn power ON

*Presto! You're back in
business*

AMPINNERGY –

System Features

- UL Listed
- CSA Certified
- NEC & CEC Approved
- 20 amp (UL) / 15 amp (CSA) rated
- System components available in:
 - ✓ 5-wire 3-1-1 (3 circuits, 1 shared neutral)
 - ✓ 8-wire 4-2-2 (4 circuits, 1 shared neutral, 1 dedicated neutral)
 - ✓ 8-wire 3-3-2 (3 circuits, 3 dedicated neutrals)
- Easily interfaced to building wiring

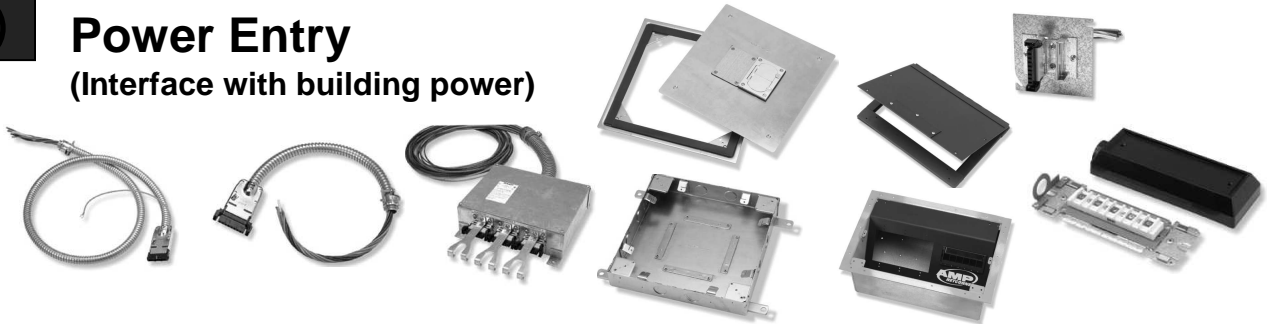
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What Should Be Specified?

1

Power Entry

(Interface with building power)



2

Cable (Jumper) Assemblies

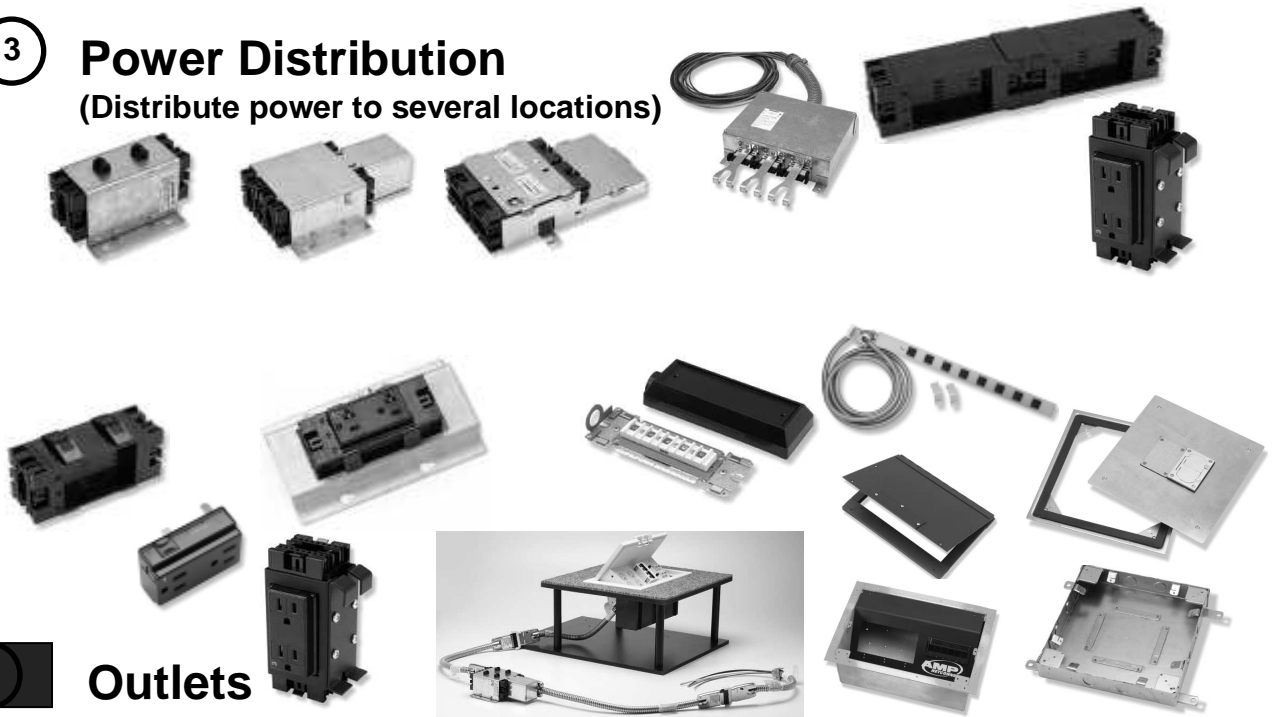
(Interconnect between system components)



3

Power Distribution

(Distribute power to several locations)



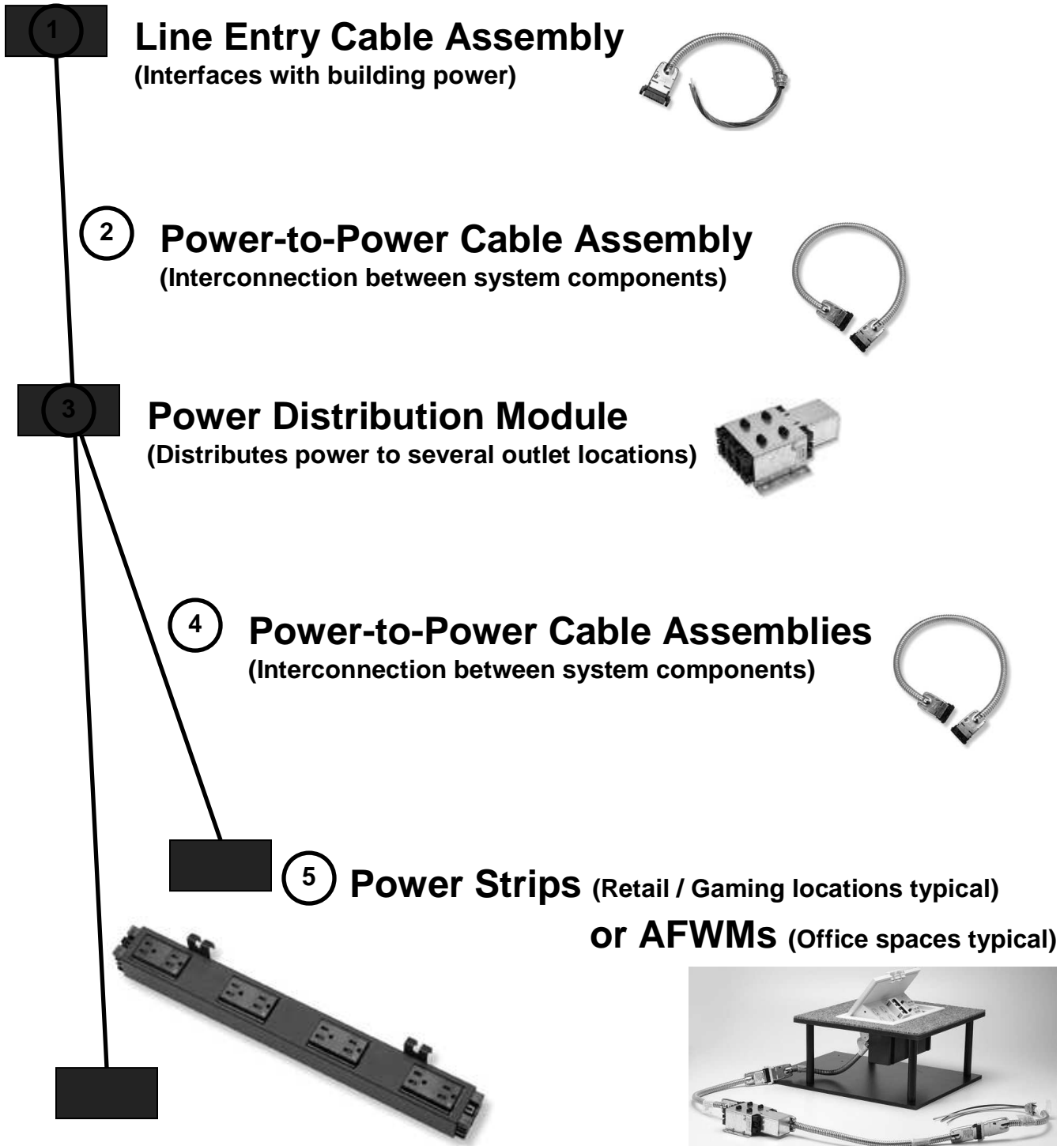
4

Outlets

(Receptacles / floor boxes, or transition back to round or undercarpet wire)

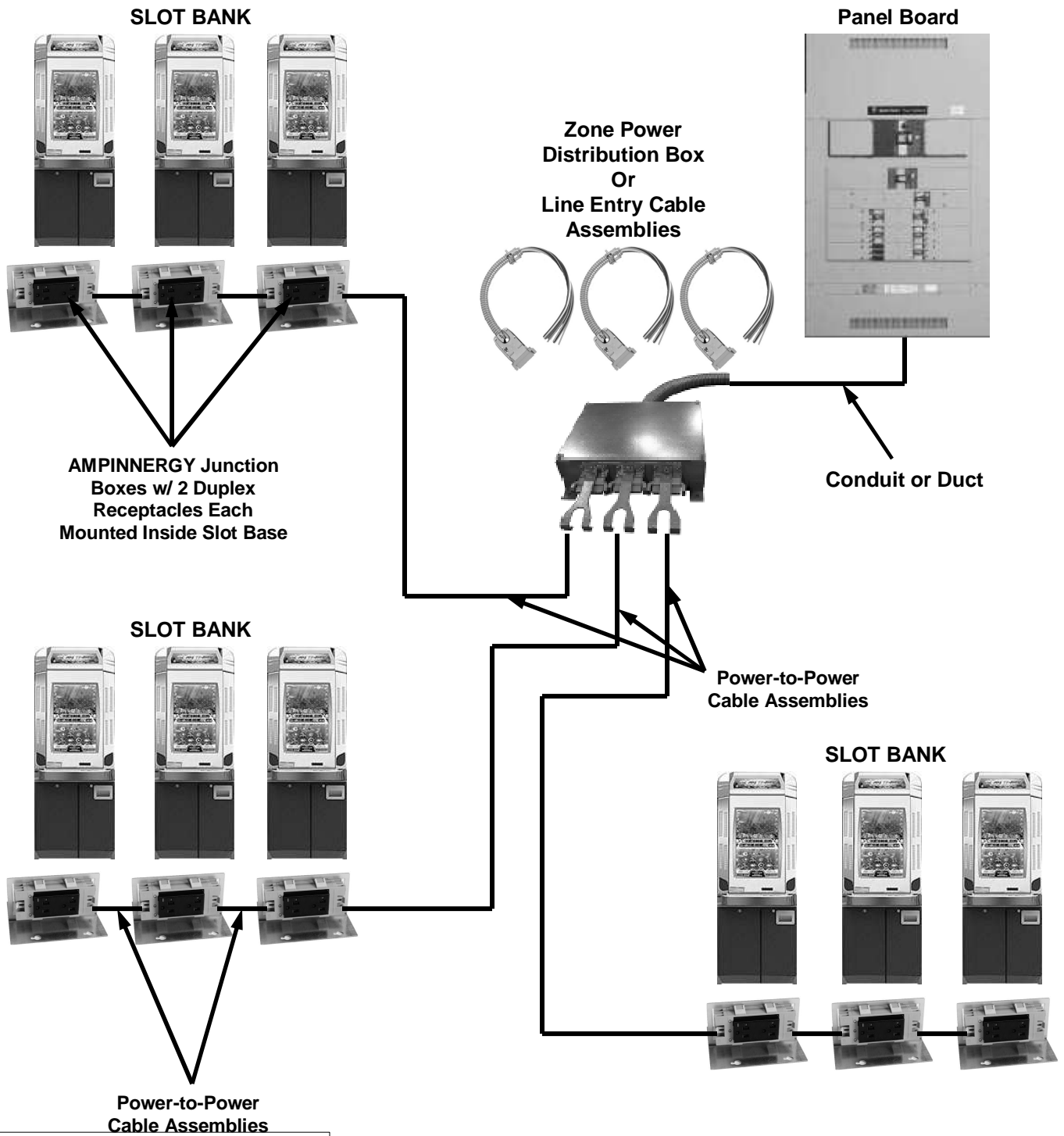
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What is a Common Configuration?



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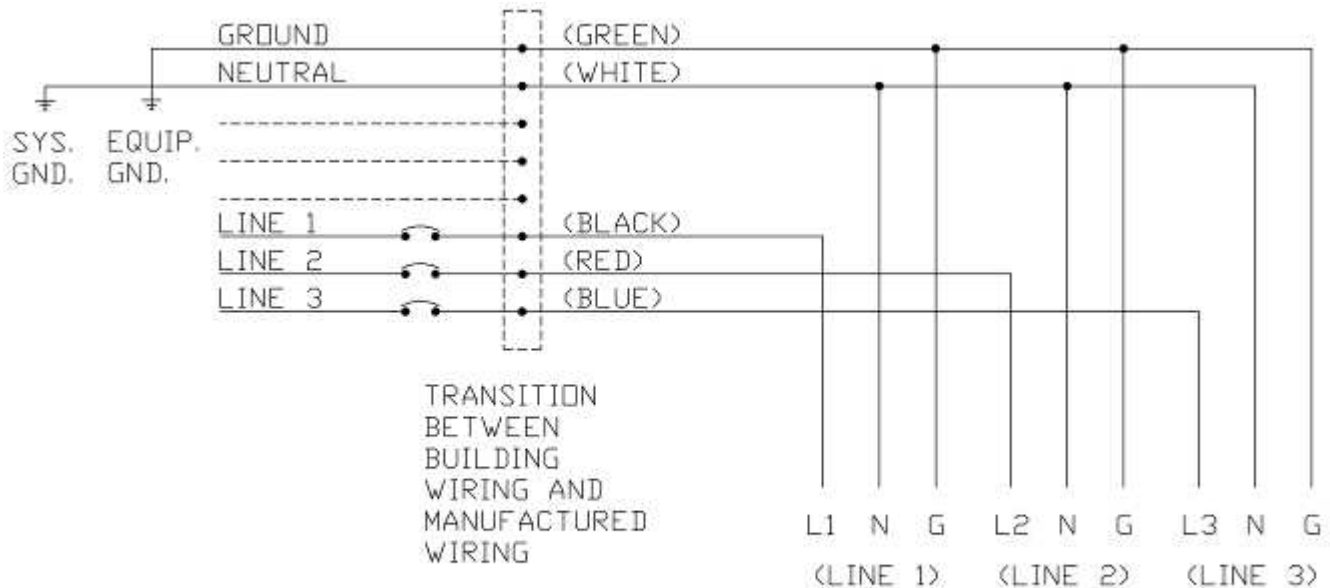
Gaming Configuration Example



AMPINNERGY –

Which Wiring Methods Are Supported?

- 5-Wire (3-1-1) Method:
 - Three lines (phases), one shared neutral, one common ground.
 - Connector color is **WHITE** to distinguish from other wiring methods.
 - 3 general-purpose circuits share one oversized (10 AWG) neutral. Oversized neutral accommodates higher currents caused by third-order harmonics.
 - Connectors are keyed so they won't interface with dedicated-neutral (3-3-2) systems.
 - **Duplex receptacles are available for any of the Line configurations shown below.**

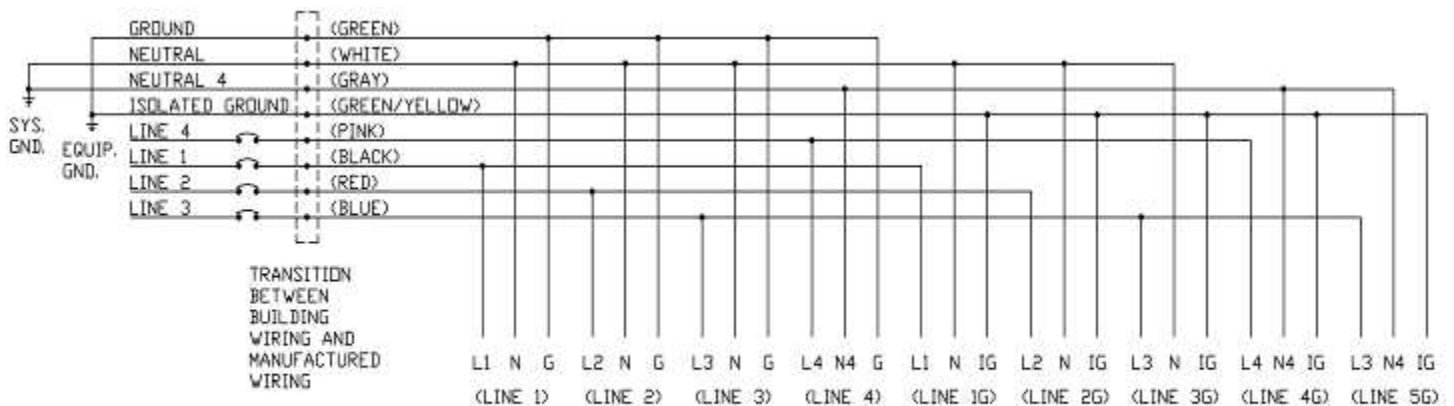


5-WIRE (3-1-1) CONFIGURATION

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Which Wiring Methods Are Supported?

- 8-Wire (4-2-2) Method:
 - Four lines (phases), one shared neutral, one dedicated neutral, one common ground, one isolated ground.
 - Connector color is **BLACK** to distinguish from other wiring methods.
 - 3 general-purpose circuits share one oversized (10 AWG) neutral. Oversized neutral accommodates higher currents caused by third-order harmonics.
 - 1 general-purpose circuit uses a dedicated neutral.
 - Any of the four circuits can be configured to use the isolated ground. Isolated grounding may be desirable for reduction of electrical noise.
 - Connectors are keyed so they won't interface with dedicated-neutral (3-3-2) systems.
 - **Duplex receptacles are available for any of the Line configurations shown below.**



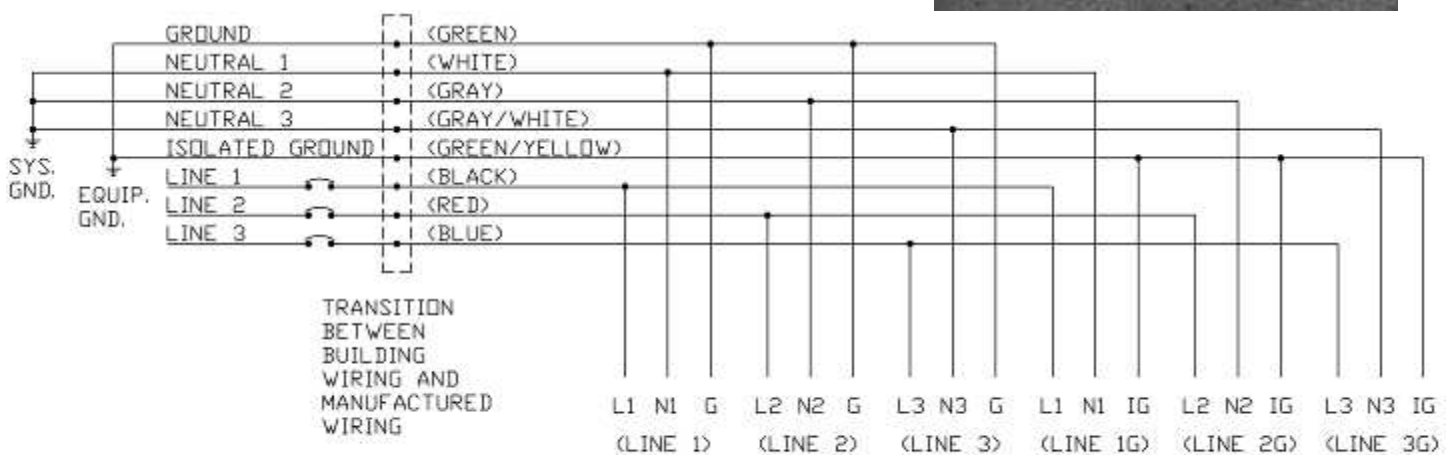
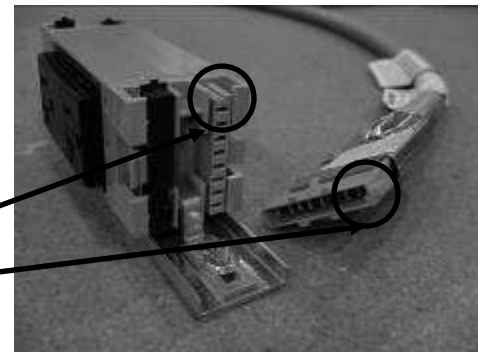
8-WIRE (4-2-2) CONFIGURATION

AMPINNERGY –

Which Wiring Methods Are Supported?

- 8-Wire (3-3-2) Method:
 - Three lines (phases), three dedicated neutrals, one common ground, one isolated ground.
 - Connector color is **NEMA GRAY** to distinguish from other wiring methods.
 - Each of 3 circuits uses separate (dedicated) neutral. Dedicated neutrals may be desirable for protection against heating and overloading of the neutral conductors due to harmonic current distortion.
 - Any of the three circuits can be configured to use the isolated ground. Isolated grounding may be desirable for reduction of electrical noise.
 - Connectors are keyed so they won't interface with shared-neutral (3-1-1 and 4-2-2) systems.
 - **Duplex receptacles available for any of the Line configurations shown below.**

Keyed Connectors



8-WIRE (3-3-2) CONFIGURATION

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Required Components for Power Entry

- Interface with building wiring:

- Line Entry Cable Assembly



- Polarized Line (female) connector on one end, non-terminated cable whip on the other end for easy assembly to customer-supplied junction box or similar transition point.
- Connects to power (male) cable connector.
- 5-wire (3-1-1) – 557652-X where X identifies length (see catalog).
- 8-wire (4-2-2) – 556148-X
- 8-wire (3-3-2) – 1933403-X

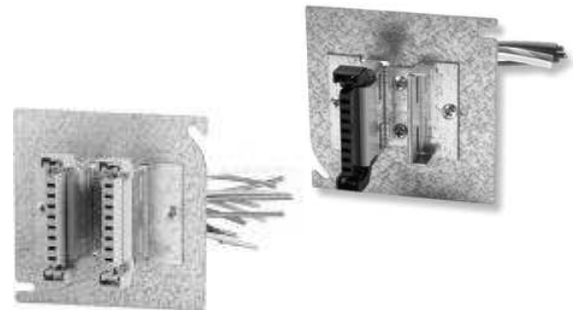
- Power Entry Cable Assembly



- Polarized Power (male) connector on one end, non-terminated cable whip on the other end for easy assembly to customer-supplied junction box or similar transition point.
- Connects to line (female) cable connector, junction box, power strip, power transition unit, or zone distribution kit.
- 5-wire (3-1-1) – 555858-X where X identifies length (see catalog).
- 8-wire (4-2-2) – 555856-X
- 8-wire (3-3-2) – 1933402-X

- Power Transition Unit

- Polarized Line (female) connector and wire attached directly to 4x4 faceplate for easy assembly to customer-supplied 4x4 junction box.
- Connects to power (male) cable connector.
- 5-wire (3-1-1) – 556190-X where X identifies 1 or 2 connectors (see catalog).
- 8-wire (4-2-2) – 556191-X
- 8-wire (3-3-2) – 1933399-X
- Use Instruction Sheet 408-3259 for installation information.



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Required Components for Power Entry

- Interface with building wiring:
 - Zone Distribution Kit
 - Enclosure houses three 8-wire assemblies, for a total of 12 circuits (4-2-2) or 9 circuits (3-3-2). Three polarized Line (female) connectors for easy assembly to system components.
 - Connects to power (male) cable connector.
 - 8-wire (4-2-2) – 406023-X where X identifies 35 FT or 50 FT conduit length (see catalog).
 - 8-wire (3-3-2) – 1933419-X.
 - Use Instruction Sheet 408-3378 for installation information.



- Interface directly with Undercarpet wiring:
 - Power Whip Kit
 - Includes power transition block.
 - Ideal for transitioning between AMPINNERGY and Undercarpet Cabling.
 - Use Instruction Sheet 408-3144 for installation information.



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Required Components for Jumpers

- Interconnections between system components:
 - Power-to-Power Cable Assembly
 - Polarized Power (male) connector on both ends for easy assembly to system components.
 - Connects between Line (female) cable connectors, junction boxes, power strips, power transition unit, or zone distribution kit.
 - 5-wire (3-1-1) – 556212-X where X identifies length (see catalog).
 - 8-wire (4-2-2) – 556127-X
 - 8-wire (3-3-2) – 1933400-X



- Power-to-Line Cable Assembly
 - Polarized Power (male) connector on one end and polarized Line (female) connector on other end for easy assembly to system components.
 - Connects between Power (male) cable connector and Line (female) cable connectors, junction boxes, power strips, power transition unit, or zone distribution kit.
 - Generally used to extend the length of a Power-to-Power Cable Assembly.
 - 5-wire (3-1-1) – 556730-X where X identifies length (see catalog).
 - 8-wire (4-2-2) – 556731-X
 - 8-wire (3-3-2) – 1933401-X



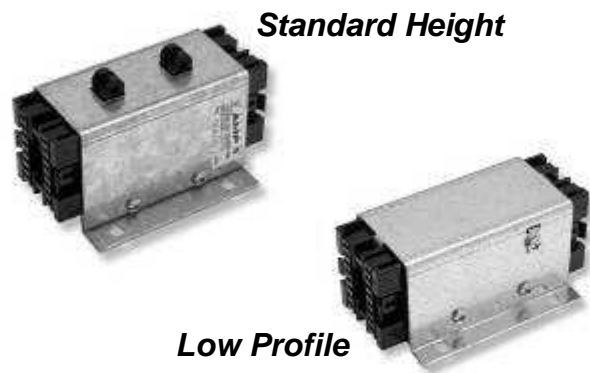
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Required Components for Power Distribution

- Distribute power to several locations:
 - Power Distribution Module
 - Polarized (female) connectors for easy assembly to system components.
 - Connects to Power (male) cable connector.
 - Use Instruction Sheet 408-3252 for installation information.

Available in 4-port (one in, three out):

- Standard Height:
 - 5-wire (3-1-1) – 556173-2
 - 8-wire (4-2-2) – 556173-1
 - 8-wire (3-3-2) – 1933405-1
- Low Profile:
 - 5-wire (3-1-1) – 406478-2
 - 8-wire (4-2-2) – 406778-1
 - 8-wire (3-3-2) – 1933406-1
- Extra-Low Profile:
 - 5-wire (3-1-1) – 1375052-2
 - 8-wire (4-2-2) – 1375052-1
 - 8-wire (3-3-2) – 1933407-1



Standard Height



Also available in 6-port (one in, five out):

- Standard Height:
 - 5-wire (3-1-1) – 556794-2
 - 8-wire (4-2-2) – 556794-1
 - 8-wire (3-3-2) – 1933472-1
- Low Profile:
 - 5-wire (3-1-1) – 406221-2
 - 8-wire (4-2-2) – 406221-1
 - 8-wire (3-3-2) – 1933473-1
- Extra-Low Profile:
 - 5-wire (3-1-1) – 1375041-2
 - 8-wire (4-2-2) – 1375041-1
 - 8-wire (3-3-2) – 1933474-1



Extra-Low Profile

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Required Components for Power Distribution

- Distribute power to several locations (continued):
 - Power Junction Box
 - Polarized (female) connectors for easy assembly to system components.
 - Connects to Power (male) cable connector.
 - Duplex receptacles can be installed directly into the junction box for expanded power distribution.

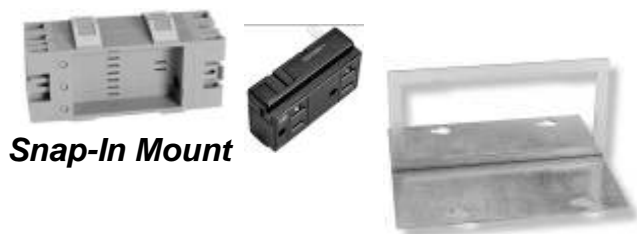
Available in Single configuration (up to 2 duplex receptacles accepted):

- Bracket Mount:
 - 5-wire (3-1-1) – 556887-1
 - 8-wire (4-2-2) – 556888-1
 - 8-wire (3-3-2) – 1933381-1
- Snap-in Mount:
 - 5-wire (3-1-1) – 556209-1
 - 8-wire (4-2-2) – 556124-1
 - 8-wire (3-3-2) – 1933382-1
- Lug Mount:
 - 5-wire (3-1-1) – 557634-1
 - 8-wire (4-2-2) – 557635-1
 - 8-wire (3-3-2) – 1933383-1



Bracket Mount

**Use with Bracket 556920-1
(Additional brackets available, see catalog)**



Snap-In Mount

Use with Bracket 1933781-1

Also available in Multiplex configuration (up to 4 duplex receptacles accepted):

- Bracket Mount:
 - 5-wire (3-1-1) – 556886-1
 - 8-wire (4-2-2) – 556946-1
 - 8-wire (3-3-2) – 1933384-1
- Snap-in Mount:
 - 5-wire (3-1-1) – 555844-1
 - 8-wire (4-2-2) – 555843-1
 - 8-wire (3-3-2) – 1933385-1
- Lug Mount:
 - 5-wire (3-1-1) – 555848-1
 - 8-wire (4-2-2) – 555847-1
 - 8-wire (3-3-2) – 1933386-1



Bracket Mount

Use with Bracket 556944-1

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Required Components for Power Distribution

- Distribute power to several locations (continued):
 - Power Junction Box (continued)

**Blank Receptacles
(non-powered) are
available – Part no.
1933011-1**

**Also available in Triplex configuration
(up to 6 duplex receptacles accepted):**

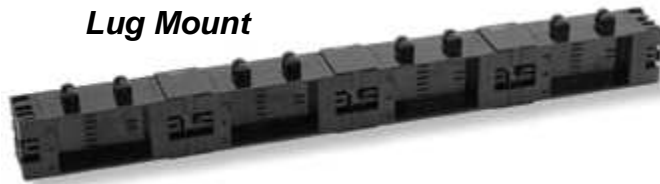
- Bracket Mount:
 - 8-wire (4-2-2) – 557802-2
 - 8-wire (3-3-2) – 1933387-1
- Snap-in Mount:
 - 8-wire (4-2-2) – 557802-1
 - 8-wire (3-3-2) – 1933388-1
- Lug Mount:
 - 8-wire (4-2-2) – 1479653-1
 - 8-wire (3-3-2) – 1933389-1



Snap-in Mount



Lug Mount



Bracket Mount



**Also available in Quadplex configuration
(up to 8 duplex receptacles accepted):**

- Bracket Mount:
 - 8-wire (4-2-2) – 557950-1
 - 8-wire (3-3-2) – 1933390-1
- Snap-in Mount:
 - 8-wire (4-2-2) – 1479442-1
 - 8-wire (3-3-2) – 1933391-1
- Lug Mount:
 - 8-wire (4-2-2) – 1479120-1
 - 8-wire (3-3-2) – 1933392-1

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Required Components for Outlets

- Several power outlet devices available:
 - Power Junction Box (from previous pages) with Duplex Receptacles.
 - Snap-in desired Line receptacles for custom load-balancing.
 - Duplex Receptacles
 - 20-amp receptacles, NEMA configuration 5-20R. 15-amp available for Canada (CSA) installations, see catalog.
 - Polarized and keyed for easy assembly into power junction boxes and power strips.
 - Duplex receptacles are available in several Line configurations – simply determine which circuit is desired at a particular outlet location and plug in the duplex receptacle that is marked for that particular Line. Duplex receptacles are clearly marked with Line designation right on the face of the receptacle.

Available in 2-inch panel thickness:

- 5-Wire (3-1-1):
 - Line 1 – 406248-1
 - Line 2 – 406249-1
 - Line 3 – 406250-1
- 8-Wire (4-2-2):
 - Line 1 – 406248-1
 - Line 2 – 406249-1
 - Line 3 – 406250-1
 - Line 4 – 406251-1
 - Line 1G – 406252-1
 - Line 2G – 406253-1
 - Line 3G – 406254-1
 - Line 4G – 406255-1
 - Line 5G – 1933342-1
- 8-Wire (3-3-2):
 - Line 1 – 1933393-1
 - Line 2 – 1933394-1
 - Line 3 – 1933395-1
 - Line 1G – 1933396-1
 - Line 2G – 1933397-1
 - Line 3G – 1933398-1



NOTES:

□ *“Panel Thickness” is a measure relating to the total thickness of the complete junction box assembly when the duplex receptacles are installed on both sides of the junction box.*

□ *The “G” designation indicates that the receptacle is wired for “isolated ground.”*

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Required Components for Outlets

- Several power outlet devices available (continued):
 - Power Strip
 - Polarized (female) connectors for easy assembly to system components.
 - Connects to Power (male) cable connector.
 - Duplex receptacles pre-installed at the factory. Receptacles can be removed and replaced in the field to accomplish load balancing where necessary.

Available in several mounting configurations:

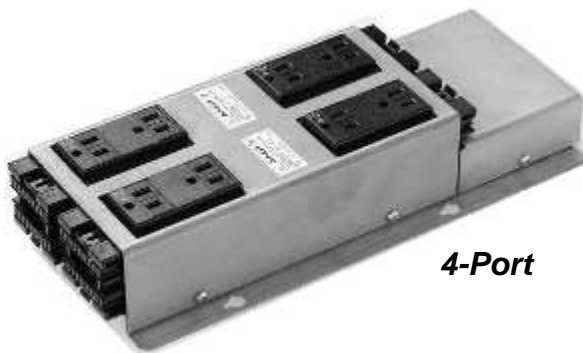
- 1-Port Keyhole Mount (up to 1 duplex receptacle accepted):
 - 8-wire (4-2-2) – 1479218-X where X identifies Line configuration (see catalog).
 - 8-wire (3-3-2) – 1933413-X
- 2-Port Keyhole Mount (up to 2 duplex receptacles accepted):
 - 8-wire (4-2-2) – 1479220-X
 - 8-wire (3-3-2) – 1933414-X
- 4-Port Keyhole Mount (up to 4 duplex receptacles accepted):
 - 8-wire (4-2-2) – 1479216-X
 - 8-wire (3-3-2) – 1933415-X
- Use Instruction Sheets 408-8663 and 408-8664 for installation information.



1-Port



2-Port



4-Port

AMPINNERGY –

Required Components for Outlets

- Several power outlet devices available (continued):
 - Power Strip (continued)

Available in several mounting configurations (Continued):

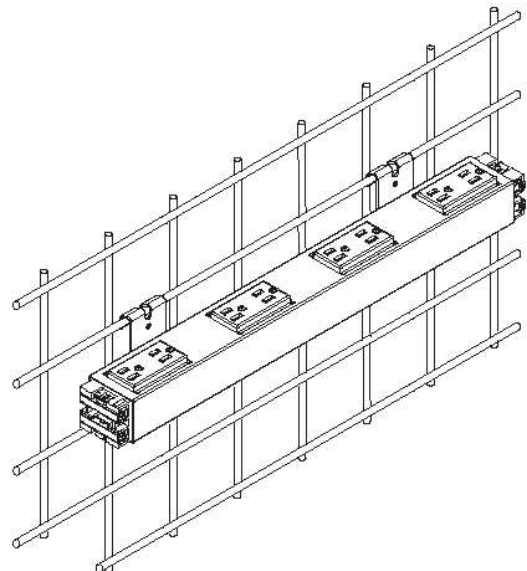
- 2-Port Horizontal Grid Mount (up to 2 duplex receptacles accepted).
 - 8-wire (4-2-2) – 1479093-X where X identifies Line configuration (see catalog).
- 2-Port Vertical Grid Mount (up to 2 duplex receptacles accepted).
 - 8-wire (4-2-2) – 1479077-X
- 4-Port Horizontal Grid Mount (up to 2 duplex receptacles accepted).
 - 8-wire (4-2-2) – 1375280-X
- Horizontal and vertical stanchion mount available.
- Use Instruction Sheets 408-8472 and 408-8574 for installation information.



4-Port Horizontal Grid Mount



2-Port Vertical Grid Mount



4-Port Horizontal Grid Mount

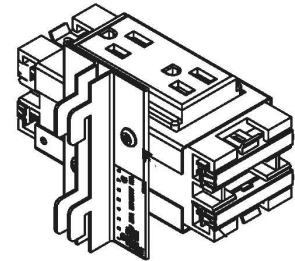
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Required Components for Outlets

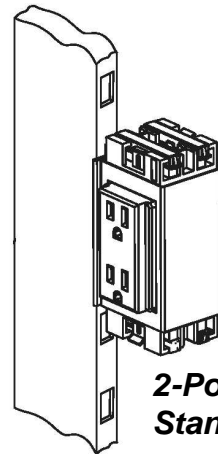
- Several power outlet devices available (continued):
 - Power Strip (continued)

Available in several mounting configurations (Continued):

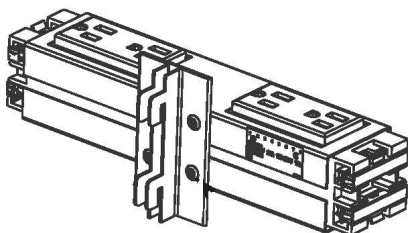
- 2-Port Horizontal Stanchion Mount (up to 2 duplex receptacles accepted).
 - 8-wire (4-2-2) – 1479093-X where X identifies Line configuration (ask your account executive for correct part number).
- 2-Port Vertical Stanchion Mount (up to 2 duplex receptacles accepted).
 - 8-wire (4-2-2) – 1479093-X
- 4-Port Horizontal Stanchion Mount (up to 4 duplex receptacles accepted).
 - 8-wire (4-2-2) – 1375280-X
- 4-Port Vertical Stanchion Mount (up to 4 duplex receptacles accepted).
 - 8-wire (4-2-2) – 1375280-X
- Use Instruction Sheets 408-8472 and 408-8574 for installation information.



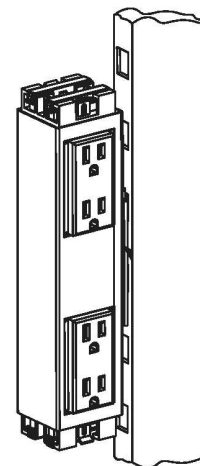
2-Port Horizontal Stanchion Mount



2-Port Vertical Stanchion Mount



4-Port Horizontal Stanchion Mount



4-Port Vertical Stanchion Mount

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Required Components for Outlets

- Several power outlet devices available (continued):
 - Access Floor Workstation Modules (AFWM)
 - Can be field-wired with a polarized (female) connector for easy assembly to system components.
 - Suitable for use in environmental air spaces.
 - Several faceplate configurations available (see catalog).

Available in several configurations:

- 5-Gang AFWM:
 - Accepts any combination of power and communications.
 - 1116700-X where X identifies color (see catalog).
 - Use Instruction Sheet 408-8338 for installation information.
- 5-Gang Rotating AFWM:
 - Accepts any combination of power and communications.
 - Suitable for use in environmental air spaces when used with enclosure 1479499-1.
 - 557601-X where X identifies color (see catalog).
 - Use Instruction Sheet 408-3287 for installation information.
- 4-Gang AFWM:
 - Accepts up to 2 duplex receptacles and any combination of communications.
 - 406376-X where X identifies color (see catalog).
 - Use Instruction Sheet 408-3397 for installation information.



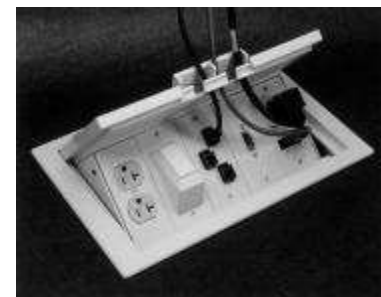
**5-Gang
8" W x 12" L
5.25" min. floor height**

Replacement Bezels Available for 4-Gang and 5-Gang Rotating AFWMs:

- 4-Gang and 5-Gang Rotating:
 - 769046-X where X denotes color (see catalog).



**4-Gang
8" W x 12" L
2.6" min. floor height**



**5-Gang Rotating
8" W x 12" L
5.5" min. floor height**

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Required Components for Outlets

- Several power outlet devices available (continued):
 - Access Floor Workstation Modules (AFWM)
 - Can be field-wired with a polarized (female) connector for easy assembly to system components.
 - Suitable for use in environmental air spaces.
 - Several faceplate configurations available – Power, data, audio/communications, and fiber (see catalog).

Available in several configurations (continued):

- 3-Gang AFWM:
 - Accepts any combination of power and communications.
 - 558716-X where X identifies color (see catalog).
 - Use Instruction Sheet 408-3356 for installation information.
- 2-Gang AFWM:
 - Accepts any combination of power and communications.
 - 558718-X where X identifies color (see catalog).
 - Use Instruction Sheet 408-3356 for installation information.

Lid Replacement Kits Available for 2-Gang and 3-Gang AFWMs:

- 2-Gang and 3-Gang:
 - 558717-X where X denotes color (see catalog).



3-Gang
7.375" W x 7.375" L
5.5" min. floor height



2-Gang
7.375" W x 7.375" L
3.5" min. floor height

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Required Components for Outlets

- Several power outlet devices available (continued):
 - Access Floor Workstation Modules – Additional Information
 - When used with a Concrete Form Box, Access Floor Workstation Modules may be installed slab-on-grade.
 - Concrete Form Boxes may also be used to assist with increasing bend radius requirements – one example of this is: the feed conduit is installed directly to the Form Box, while the cable or fiber is routed neatly inside the larger Form Box enclosure and directly to the faceplate of the AFWM without having to bend the cable or fiber inside the smaller AFWM enclosure.

Form Boxes Available from Barthelmes Mfg Co., Inc.

Phone (585) 328-8140:

- 5-Gang and 5-Gang Rotating AFWM:
 - Size – 18"W x 18"D x 6.3"H – U135806
- 4-Gang AFWM:
 - Size – 18"W x 18"D x 6.3"H – U135806
 - Size – 18"W x 18"D x 3.5"H – U135830
 - Size – 18"W x 18"D x 2.75"H – U135840
- 3-Gang AFWM:
 - Size – 18"W x 18"D x 6.3"H – U135820
- 2-Gang AFWM:
 - Size – 18"W x 18"D x 6.3"H – U135820

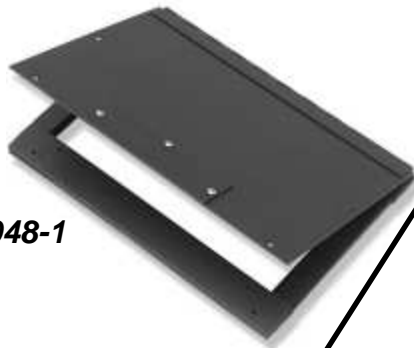


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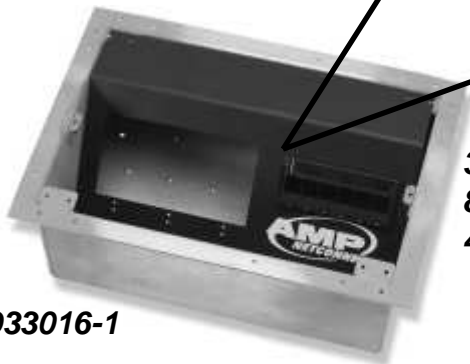
Required Components for Outlets

- Several power outlet devices available (continued):
 - Flush Floor Service Hideaway Universal Box
 - Use slab-on-grade or with access floors.
 - Multi-purpose – use as a transition box or power outlet, or both.
 - Combines up to three power receptacles and up to six SL Series data/communications ports in one fitting.
 - If power receptacles or transition is not needed, the three power receptacle spaces can be converted to additional data/communications ports by using mounting straps or AFWM flush faceplates (available, see catalog).
 - Flush Floor Service Hideaway Universal Box – 1933016-1
 - Cover – 1933048-1
 - Use Instruction Sheet 408-10164 for installation information.

1933048-1



1933016-1



3-Gang + 6-Port
8" W x 12" L
4.6" min. floor height



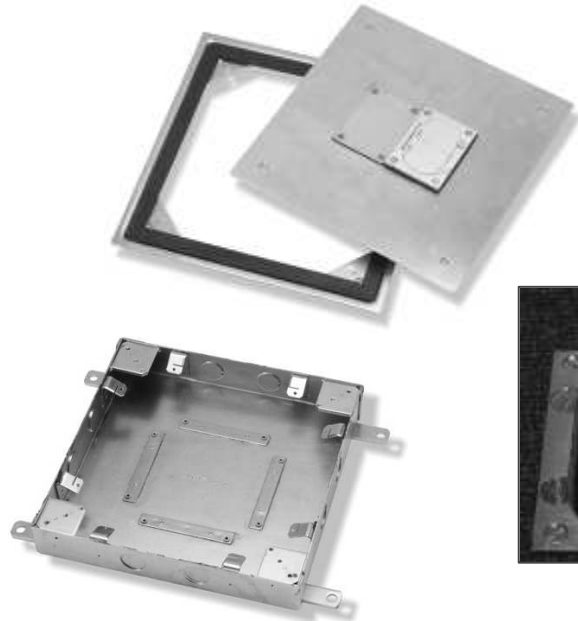
Installation example, used with Undercarpet Cabling

AMPINNERGY –

Required Components for Outlets

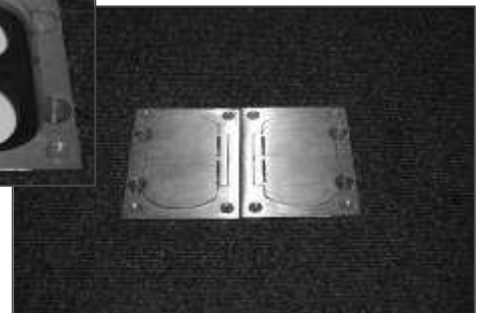
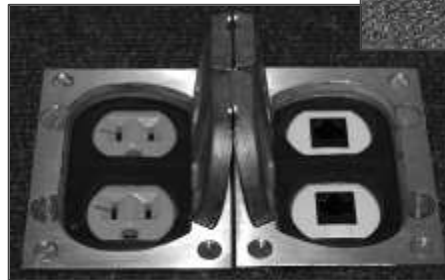
- Several power outlet devices available (continued):
 - Undercarpet Flush Floor Service Box with Cover
 - Three styles available: blank (9-1933131-9), one-gang (1933131-1), and two-gang (1933131-2).
 - Use slab-on-grade or with access floors.
 - Multi-purpose – use as a transition box or power outlet, or both.
 - With proper power/communications separation kits and duplex mounting straps (available, see catalog), combine power and communications in the same box – up to one power receptacle and up to four SL Series data/communications ports.
 - Suitable for Category 5E and Category 6 transition blocks, as well as power transition blocks.
 - Use Instruction Sheet 408-3118 and 408-10141 for installation information.

Installation example, power and data



1933131-X

**0-, 1- or 2-Gang
11.75" W x 11.75" L
2.5" min. floor height**



AMPINNERGY –

Codes & Agency Specifications

- AMPINNERGY meets the following:
 - Voltage Rating:
 - 125/250 volts AC
 - Current Rating:
 - 20 amps
 - 15 amps (standard for Canada installations)
 - Complies with 2005 and 2008 National Electrical Code
 - Article 604 and Article 605
 - UL Listed
 - Manufactured Wiring Systems (UL File E132626)
 - Complies with CSA C22.1-06, “Canadian Electrical Code, Part I”
 - Section 12, Rule 12-2500
 - Certified by Canadian Standards Association
 - Manufactured Wiring Systems (File 7189)
 - Modular Wiring Systems and Accessories (File 7189)
 - 15 amp receptacles are standard for Canada installations

AMPINNERGY –

Additional Information

- Conforms to **2005 and 2008 National Electrical Code** (NFPA 70), Article 604 and Article 605.
- **UL Listed:** File Number E132626 – Manufactured Wiring Systems
- Conforms to **2006 Canadian Electrical Code, Part I** (CSA C22.1-06), Section 12, Rule 12-2500.
- **CSA Certified:** File Number 7189 – Manufactured Wiring Systems, and Modular Wiring Systems and Accessories.
- **Product Information Center: (800) 522-6752.**
- Customer Service (Pricing Inquiries): (800) 553-0938.
- AMPINNERGY Layout and Planning Manual, #124235.
- On the Web: <http://www.ampnetconnect.com>