BradPower™
Modular Power Solutions
Contact us for more information on additional Brad® Products from Woodhead.

Woodhead

Connectors and Cordsets
A wide array of quick-connect products to support rapid field wiring on control, signal, and power

PLC Interface Cards
Interface cards for connecting PLCs to industrial networks

Distribution Boxes
Pre-wired junction boxes to simplify and consolidate wiring installations

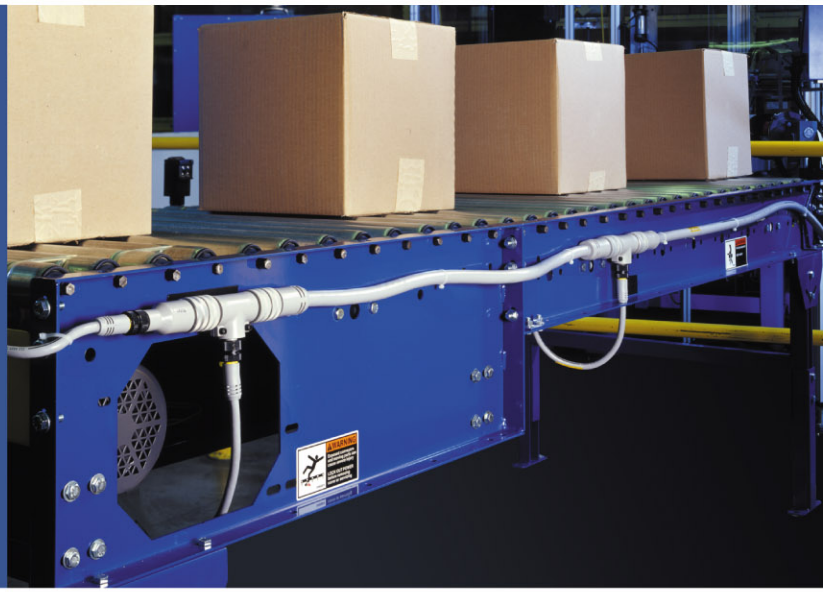
PC Interface Cards
Interface cards for connecting PCs to industrial networks

I/O Products
Rugged, IP67 Input/Output modules

Gateways
Bridge between dissimilar industrial networks or the Internet

Ethernet Switches and Media Converters
Rugged, industrialized Ethernet switches and components

Network Diagnostic Products
Industrial network communication diagnostic products



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BradPower™
Modular Power Solutions

Modular, flexible wiring systems for machine power distribution and motor control

BradPower™ Modular Power Systems

Reduce Total Installed Cost and Commissioning Time

Designers and builders of industrial machinery employ Woodhead's BradPower™ modular wiring systems to:

- Reduce operating costs
- Accelerate machine set-up
- Increase efficiency
- Speed up delivery and commissioning of new equipment

BradPower™ *Power without the pipe.℠*

Modular, Easy to Install

BradPower solutions replace machine hard wiring with modular, quick-connect systems comprised of crush-resistant, pre-wired cordsets and factory-molded connectors. The result is a robust, scalable and easy-to-install power distribution system that does not require the specialized tools and labor typically associated with traditional conduit or raceway installations.

Performance

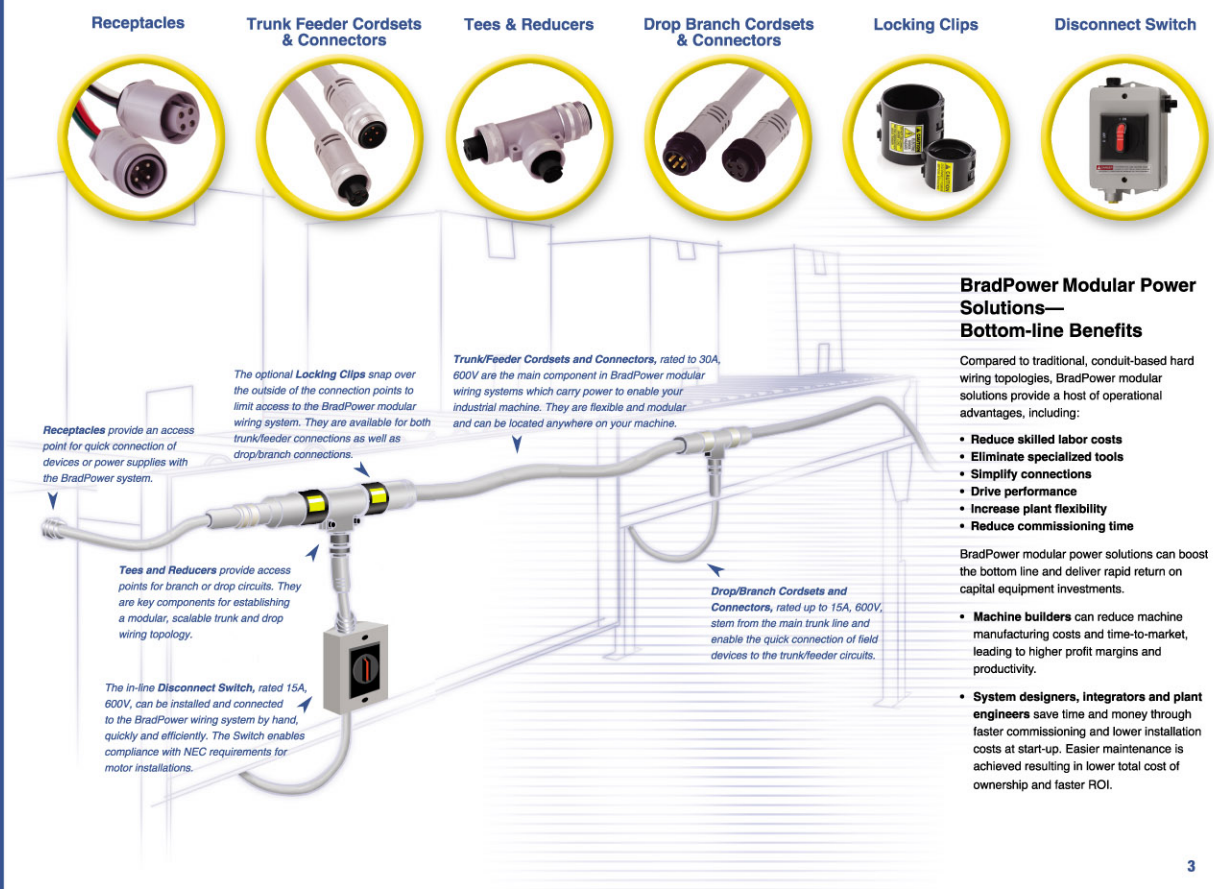
BradPower wiring systems' modular components make installation faster, easier, and more reliable. Where multiple machines are involved, assembling the systems is consistent and repeatable. BradPower products deliver the same unsurpassed performance and innovation the industry has come to expect from the Brad Harrison® brand.

NFPA-79-2002 Standard Compliance

In 2002, revisions to the National Fire Protection Association's NFPA-79 Electrical Standard for Industrial Machinery, in cooperation with the National Electrical Code® (NEC), opened the door to a practical alternative to hard-wired power distribution and motor control within industrial machinery and coordination of multiple machines.

With the NFPA-79 code changes governing electrical and electronic wiring standards in industrial machinery, machine manufacturers and automation system designers now have an opportunity to streamline machine commissioning and significantly reduce machine wiring costs with Woodhead's innovative BradPower modular power solutions.

When properly installed and maintained, all BradPower systems are fully compliant with the NFPA-79-2002 Standard for Industrial Machinery and meet UL direct support requirements that enable code-compliant installations.



BradPower Modular Power Solutions— Bottom-line Benefits

Compared to traditional, conduit-based hard wiring topologies, BradPower modular solutions provide a host of operational advantages, including:

- **Reduce skilled labor costs**
- **Eliminate specialized tools**
- **Simplify connections**
- **Drive performance**
- **Increase plant flexibility**
- **Reduce commissioning time**

BradPower modular power solutions can boost the bottom line and deliver rapid return on capital equipment investments.

- **Machine builders** can reduce machine manufacturing costs and time-to-market, leading to higher profit margins and productivity.
- **System designers, integrators and plant engineers** save time and money through faster commissioning and lower installation costs at start-up. Easier maintenance is achieved resulting in lower total cost of ownership and faster ROI.

BradPower™ Modular Power System

50% Reduction in Total Installed Cost[1]
70% Reduction in Commissioning Time[2]

BradPower™ Solutions serve a world of industrial machinery:

- Food & Beverage
- Logistics & Distribution
- Automotive
- Pharmaceutical
- Printing & Converting
- Semiconductor

BradPower™ *Power without the pipe.™*

Cordsets and Connectors

BradPower Modular Power Solutions are rugged, factory-applied connectors molded onto pre-wired cordsets. These include:

- Molded trunk cables for feeder circuits up to 30A, 600V AC/DC
- Molded drop cables for branch circuits up to 15A, 600V AC/DC

The versatile dual-rated STOOW and TC/Open Wiring-rated quick-connect cordsets allow a trunk/feeder line to be installed along an individual machine's structure—or installed in a daisy-chain configuration along a group of machines—with convenient access points for power to be dropped in as required via the drop/branch cordsets. Available in a range of configurations and key options, the ruggedly

constructed BradPower cordsets are strong and crush-resistant to provide connectivity in the most demanding environments. Each cordset's over-molded connector head provides NEMA 6P and IP67 industrial ratings to withstand moisture, machine vibration and other harsh industrial challenges.

Tees and Reducers

A selection of BradPower Tees and Reducers provide flexibility and modular wiring options, no matter how complex the machinery or motor control system design. Tees combined with a drop connector provide an access point for branch circuits to field devices, while tees with a trunk connector split the main feeder circuit into sub-segments. Multiple key options enable differentiated circuits on trunk feeder lines.

Receptacles

At the termination point at motors and drives, BradPower Receptacles offer a quick-connect interface to the device or cabinet.

Disconnect Switch

An easy-to-install in-line Disconnect Switch connects in seconds to ensure code compliance and provide lockout/tagout at individual motor or drive locations.

Accessories

Accessories such as closure caps maintain sealing integrity and provide convenient "stop points" for expandable power systems.

BradPower Field Attachable connectors deliver the flexibility for machine installers to cut a cable to length on-site during installation. With convenient screw down terminals, no special crimping tools are needed and

the final cable lengths can be adjusted on the job to fit the application. Manufactured to accommodate a range of cable sizes, these field installable connectors also feature built-in strain relief.

Clamshell-style, reusable Locking Clips are designed to snap over the outside of the Trunk/Feeder or Drop/Branch connection point to limit access to the flexible wiring system.

Application Achievements

- [1] **Automotive** An automotive chassis carriage finishing plant used a total of 889 motor connection points to automate and synchronize its paint booth operations.

  Result: deep labor and tooling savings.

- **Food Processing** A large poultry processing plant experienced significant routine maintenance downtime savings by connectorizing 140 of its machine motors for fast, easy changeout and re-connection.
- **Beverage Industry.** A beverage bottling plant replaced hard conduit wiring from a centralized control cabinet with flexible cordsets to 30 motors in a case washing system.

- [2] **Automation.** An automotive supplier reduced installation time of its brake assembly welding and inspection line from three days to one day.

BradPower Solutions for Food and Beverage Processors

To meet the unique needs of the food and beverage industry, Woodhead offers a complete range of specialized BradPower modular power components designed for use in food and beverage processing machines and automated cleaning systems. These components provide the same reliable electrical characteristics and high-performance of standard BradPower Systems, and also feature:

- Smooth overmolds designed to eliminate food traps
- 316 Stainless Steel coupling nuts for maximum corrosion resistance
- IP69K-rated environmental performance, ideal for high pressure wash-down areas

Ordering Made Easy

Ordering BradPower Food and Beverage-grade cordsets, connectors, tees, and receptacles is easy. Simply add an "8" to the end of any standard BradPower part number. For example:

Standard
Part Number: CC3030A48M050

Food and Beverage
Part Number: CC3030A48M050**8**

BradPower™ Products meet NFPA-79 Standards

The BradPower product line brings a flexible and cost effective alternative to designers and users of industrial machines by capitalizing on recent changes to the NFPA-79 standard which governs electrical installations on industrial equipment.

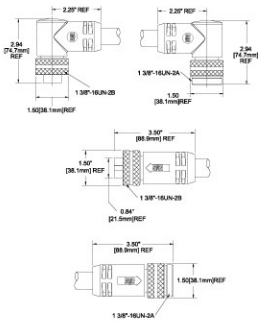
The NFPA-79 standard focuses on best practices and guidelines for safe, robust electrical design and electrical installation on industrial machinery. It complements the National Electric Code by clarifying the proper implementation of NEC requirements in industrial equipment applications. The scope of NFPA-79 includes all electrical and electronic elements on industrial equipment operating at 600V or less. In 2002, the NFPA-79 code underwent significant revisions.

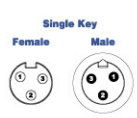
Significant changes to the wiring practices in NFPA-79 allows the implementation of a fully compliant installation using the BradPower modular power system. The changes with the most impact on the applicability of the BradPower system are:

	1997 Edition	2002 Edition	Benefits
Conductor Sizing for Power Circuits	Conductors shall not be smaller than 14AWG (section 15.3 (a))	Conductors shall not be smaller than 14AWG, however 16AWG and 18AWG may be used under circumstances listed (section 13.6.1)	• Greater flexibility for drop or branch circuits • Use of BradPower 16AWG drop cordsets for power distribution
Wiring Methods and Practices on **Connectors**	Conductors and cables shall be run without splices from terminal to terminal (section 16.1.4)	Conductors and cables shall be run from terminal to terminal without splices ... BUT ... Factory applied connectors molded onto cables shall be permitted. Such connectors shall not be considered as splices (section 14.1.2.1 and 14.1.2.2)	• No mis-wiring • Quick change-out • Easy maintenance • Easy reconfiguration • Allows connectors to be used within runs, permitting tees and other transitional components that provide: Modular wiring systems Plant flexibility
Wiring Methods and Practices on **Exposed Cable**	Conductors and their connections external to the control panel shall be totally enclosed in suitable raceways or enclosures... (section 16.3.1)	Exposed cables installed along the structure of the equipment or system, or in the chassis of the machinery shall be permitted. Exposed cables shall be installed to closely follow the surface and structural members of the machinery (section 14.1.4.1).	• Eliminates the need for conduit or raceways • Fast installation • No tools required • Allows cable to be dressed along existing structures (no additional hardware required) • Large labor savings • Easy to change and maintain

The BradPower products allow electrical designers to take full advantage of these recent changes. BradPower modular power systems make it possible to have a code compliant system implementation!

Trunk/Feeder Connectors



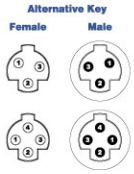


Single Key

3 Pole
1 - Black
2 - Green/Yellow
3 - White

4 Pole
1 - Black
2 - Green/Yellow
3 - Red
4 - White

Alternative Key



Trunk/Feeder

BradPower cordsets for trunk and feeder circuits offer durable components for the layout of a scalable wiring system for power distribution. Available in 3 and 4 pole configurations with dual rated 10 AWG cable, Trunk/Feeder cordsets provide the flexibility necessary for electrical power applications up to 30A, 600V AC/DC. Multiple key options enable differentiated circuits on trunk/feeder lines.

Single-ended				Straight	90°
Single Key	3 Pole	30A 10AWG	Male	C03006A48Mxxx	C03007A48Mxxx
			Female	C03000A48Mxxx	C03001A48Mxxx
	4 Pole	25A 10AWG	Male	C04006A48Mxxx	C04007A48Mxxx
			Female	C04000A48Mxxx	C04001A48Mxxx
Alternative Key	3 Pole	30A 10AWG	Male	C03106A48Mxxx	C03107A48Mxxx
			Female	C03100A48Mxxx	C03101A48Mxxx
	4 Pole	25A 10AWG	Male	C04106A48Mxxx	C04107A48Mxxx
			Female	C04100A48Mxxx	C04101A48Mxxx

'Mxxx' – length in meters. Examples: M010 = 1m, M005 = 0.5m, M100 = 10m
Single Key products are standard items. Alternative Key products are non-standard items.

Double-ended	Female Straight Male Straight	Female 90° Male Straight	Female Straight Male 90°	Female 90° Male 90°
Single Key 3 Pole 30A/10AWG	CC3030A48Mxxx	CC3031A48Mxxx	CC3032A48Mxxx	CC3033A48Mxxx
Single Key 4 Pole 25A/10AWG	CC4030A48Mxxx	CC4031A48Mxxx	CC4032A48Mxxx	CC4033A48Mxxx
Alternative Key 3 Pole 30A/10AWG	CC3130A48Mxxx	CC3131A48Mxxx	CC3132A48Mxxx	CC3133A48Mxxx
Alternative Key 4 Pole 25A/10AWG	CC4130A48Mxxx	CC4131A48Mxxx	CC4132A48Mxxx	CC4133A48Mxxx

'Mxxx' – length in meters. Examples: M010 = 1m, M005 = 0.5m, M100 = 10m
Single Key products are standard items. Alternative Key products are non-standard items.

Specifications

Mechanical	Connector Body	Gray PVC
	Insert	Black PVC
	Coupling Nut	Anodized Aluminum
Electrical	Contact	Copper Alloy with Gold over Nickel Plating
	Cable	Gray PVC, 10AWG, dual rated UL TC/Open Wiring and STOOW
	Ratings	25A (4P), 30A (3P), 600V AC/DC
Environmental	Protection	IP67
Certifications	US Canada	UL Listed to UL 1977 cUL Listed to CSA 22.2 182.3

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Drop/Branch

BradPower™ cordsets for drop and branch circuits feature a Mini-Change® connector, which allows for the quick connection of field devices to trunk/feeder circuits. Available in 3 and 4 pole configurations with 14 or 16 AWG cable, drop/branch circuits can be wired quickly and easily for applications up to 15A, 600V AC/DC.

Single-ended			Straight	90°
3 Pole	15A 14AWG	Male	103006A46Mxxx	103007A46Mxxx
		Female	103000A46Mxxx	103001A46Mxxx
	13A 16AWG	Male	103006A45Mxxx	103007A45Mxxx
		Female	103000A45Mxxx	103001A45Mxxx
4 Pole	15A 14AWG	Male	104006A46Mxxx	104007A46Mxxx
		Female	104000A46Mxxx	104001A46Mxxx
	10A 16AWG	Male	104006A45Mxxx	104007A45Mxxx
		Female	104000A45Mxxx	104001A45Mxxx

'Mxxx' – length in meters. Examples: M010 = 1m, M005 = 0.5m, M100 = 10m

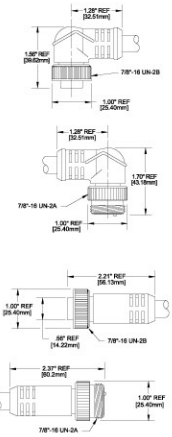
Double-ended	Female Straight Male Straight	Female 90° Male Straight	Female Straight Male 90°	Female 90° Male 90°
3 Pole 15A/14AWG	113030A46Mxxx	113031A46Mxxx	113032A46Mxxx	113033A46Mxxx
3 Pole 13A/16AWG	113030A45Mxxx	113031A45Mxxx	113032A45Mxxx	113033A45Mxxx
4 Pole 15A/14AWG	114030A46Mxxx	114031A46Mxxx	114032A46Mxxx	114033A46Mxxx
4 Pole 10A/16AWG	114030A45Mxxx	114031A45Mxxx	114032A45Mxxx	114033A45Mxxx

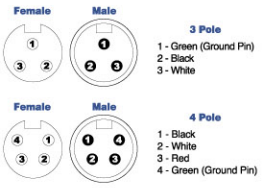
'Mxxx' – length in meters. Examples: M010 = 1m, M005 = 0.5m M100 = 10m

Specifications

Mechanical	Connector Body	Gray PVC
	Insert	Black PVC
	Coupling Nut	Zinc Diecast with Black Epoxy Coating
Electrical	Contact	Brass with Gold over Nickel Plating
	Cable	Gray PVC, 14AWG and 16 AWG, dual rated UL TC/Open wiring and STOOW
	Ratings	10A (16AWG), 15A (14AWG), 600V AC/DC
Environmental	Protection	IP67
Certifications	US Canada	UL Listed to UL 1977 cUL Listed to CSA 22.2 182.3

Drop/Branch Connectors





3 Pole
1 - Green (Ground Pin)
2 - Black
3 - White

4 Pole
1 - Black
2 - White
3 - Red
4 - Green (Ground Pin)

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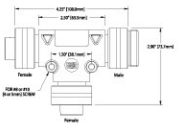
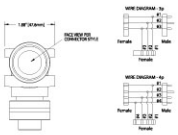
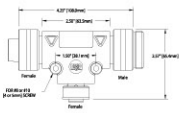
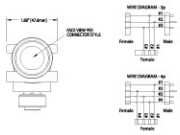
Trunk Tee (Fig. 1)





Reducing Tee (Fig. 2)





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Tees

Providing access points for branch or drop circuits, BradPower tees are key components for establishing a modular, scalable, trunk and drop wiring topology. Tees with a drop connector provide an access point for branch circuits to field devices, while tees with a trunk connector splilt the main feeder circuit into sub-segments. Multiple key options enable differentiated circuits on trunk/feeder lines.

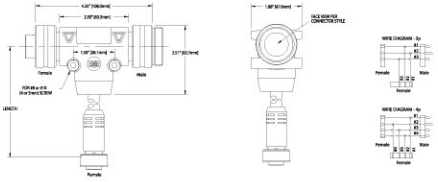
Trunk Tees (Fig. 1)	Single Key	Alternative Key
3 Pole	TC30C30-200	TC31C31-200
4 Pole	TC40C40-200	TC41C41-200

Reducing Tees (Fig. 2)	Single Key	Alternative Key
3 Pole	TC30130-200	TC31130-200
4 Pole	TC40140-200	TC41140-200

Tees with Drop Cable (Fig. 3)		Single Key	Alternative Key
14 AWG with Drop Connector	3 Pole	TC30200A46Mxxx	TC31200A46Mxxx
	4 Pole	TC40200A46Mxxx	TC41200A46Mxxx
16 AWG with Drop Connector	3 Pole	TC30200A45Mxxx	TC31200A45Mxxx
	4 Pole	TC40200A45Mxxx	TC41200A45Mxxx

'Mxxx' - Length in meters. Examples: M010 =1M, M005 = 0.5M, M100 = 10M
Tees without standoff features are available for space sensitive applications.

Specifications		
Connector Body		Gray PVC (Single Key), Black PVC (Alternative Key)
Insert		Black PVC
Coupling Nut		Anodized Aluminum (Trunk), Black Zinc Diecast (Drop)
Contact		Copper Alloy with Gold over Nickel Plating
Electrical Ratings	Voltage	600V AC/DC
	Max Input Current	25A (4P), 30A (3P)
	Max Drop Current	Trunk Tees: 25A (4P), 30 A (3P) Reducer Tees: 15A (14 AWG), 13A (16 AWG, 3P), 10A (16 AWG, 4P)
Certifications	US Canada	UL Listed to UL 1977 cUL Listed to CSA 22.2 182.3



Reducers

In addition to tees, in-line reducers are central to achieving the most versatile, scalable wiring system possible.

In-Line Reducers		Single Key	Alternative Key
Trunk Reducer to Female Drop Connector (Fig. 4)	3 Pole	1C3030-001	1C3130-001
	4 Pole	1C4030-001	1C4130-001

Specifications		
Mechanical	Connector Body	Gray PVC (Single Key), Black PVC (Alternative Key)
	Insert	Black PVC
	Coupling Nut	Anodized Aluminum (Trunk), Zinc Diecast, Black E-Coat (Drop)
Electrical	Contact	Copper Alloy with Gold over Nickel Plating
	Voltage	600V AC/DC
	Current	15A
Certifications	US Canada	UL Listed to UL 1977 cUL Listed to CSA 22.2 182.3

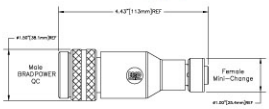
Field Attachables (Available Fall 2005)

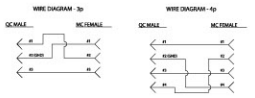
BradPower™ field attachable connectors deliver the flexibility for machinery installers to cut a cable to length on-site during installation. Available in Single Key only.

In-Line Reducers		Male Straight	Female Straight
Trunk/Feeder (Fig. 5)	3 Pole	CA3006-39	CA3000-39
	4 Pole	CA4006-39	CS4000-39
Drop/Branch (Fig. 6)	3 Pole	1A3006-34	1A3000-34
	4 Pole	1A4006-34	1A4000-34

Specifications		Trunk	Drop
Mechanical	Connector Body	Polyamide PA6	Polyamide PA6
	Insert	Black PVC	Black PUR
	Coupling Nut	Anodized Aluminum	Nickel Plated Brass
	Grommet	Neoprene	Neoprene
	Cable OD Range	0.43" - 0.82" (11mm - 21mm)	0.20" - 0.48" (5 - 12mm)
	Wire Gauge Range	14AWG (2.5mm²) - 8AWG (10mm²)	24AWG (.25mm²) - 14AWG (2.5mm²)
Electrical	Contacts	Gold plated Copper	Gold plated Brass
	Voltage Rating	600V AC/DC	600V AC/DC
	Amperage	30A (3p), 25A (4p)	15A
	Electrical Ratings	25A/600V (4P) 30A/600V (3P)	25A/600V (4P) 30A/600V (3P)
Environmental	Protection	IP67	IP67

Reducer (Fig. 4)





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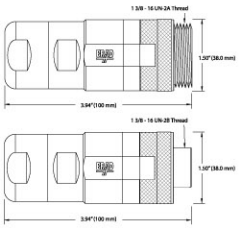
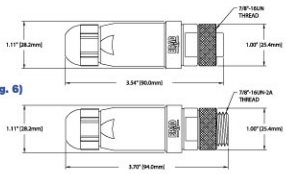
Field Attachables

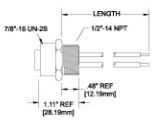
(Fig. 5)

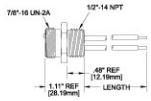


(Fig. 6)

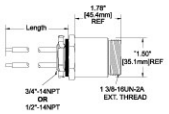


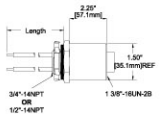
Drop/Branch





Trunk/Feeder





Receptacles

As the termination point at motors and devices, BradPower receptacles offer a quick connect interface to your device or cabinet. Accessories such as closure caps maintain sealing integrity and provide convenient "stop points" for expandable power systems. Multiple key options enable differentiated circuits on trunk/feeder lines.

Trunk/Feeder			Mounting Thread	Female	Male
Single Key	3 Pole	10AWG	**1/2-14NPT**	CR3000A30Mxxx	CR3006A30Mxxx
			3/4-14NPT	CR3C00A30Mxxx	CR3C06A30Mxxx
	4 Pole	10AWG	**1/2-14NPT**	CR4000A30Mxxx	CR4006A30Mxxx
			3/4-14NPT	CR4C00A30Mxxx	CR4C06A30Mxxx
Alternative Key	3 Pole	10AWG	**1/2-14NPT**	CR3100A30Mxxx	CR3106A30Mxxx
			3/4-14NPT	CR3D00A30Mxxx	CR3D00A30Mxxx
	4 Pole	10AWG	**1/2-14NPT**	CR4100A30Mxxx	CR4106A30Mxxx
			3/4-14NPT	CR4D00A30Mxxx	CR4D06A30Mxxx

Drop/Branch

	3 Pole	14AWG	**1/2-14NPT**	1R3000A28AxxxG	1R3006A28AxxxG
		16AWG		1R3000A20AxxxG	1R3006A20AxxxG
	4 Pole	14AWG	**1/2-14NPT**	1R4000A28AxxxG	1R4006A28AxxxG
		16AWG		1R4000A20AxxxG	1R4006A20AxxxG

'Mxxx' – length in meters. Examples: M010 = 1m, M005 = 0.5m, M100 = 10m
'Axxx' – length in inches. Examples: A010 = 1in, A120 = 12in

Specifications		Trunk/Feeder	Drop/Branch
Mechanical	**Insert**	Black PVC	Black PVC
	Receptacle Shell	Anodized Aluminum	Zinc Diecast, Black E-Coat (male) Anodized Aluminum (female)
Electrical	**Contact**	Gold over Nickel Plated Copper	Gold over Nickel Plated Brass
	Wire Insulation	PVC	PVC
	Wire Gauge	10AWG	14 and 16AWG
	Electrical Ratings	25A/600V (4P) 30A/600V (3P)	15A/600V (14AWG) 13A/600V (16AWG)
Environmental	**Protection**	IP67	IP67
Certifications	**US** **Canada**	UL Listed to UL 1977 cUL Listed to CSA 22.2 182.3	

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Accessories

Accessories include closure caps and locking clips for trunk/feeder and drop/branch connectors. The BradPower™ clamshell style locking clips snap over the outside of the connection point to limit access to the hand installable wiring system.

Locking Clips	Part Number	Quantity
Trunk/Feeder	66200A-10	10
Drop/Branch	11400A-10	10

Closure Caps	Female	Male
Trunk/Feeder	55-0198	55-0298
Drop/Branch	65-0085	65-0086

Specifications		Locking Clips	Closure Caps
Mechanical	**Material**	ABS/PC Plastic	Anodized Aluminum
	Color	Black	Gray
Electrical		Non-current carrying, no ratings required.	
Environmental	**Operating Temp**	-40° to 113° F (-40° to 45° C)	
	Protection	No rating required.	

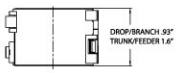
Disconnect Switch

The BradPower in-line disconnect switch is as easy to install as the BradPower modular wiring system. The disconnect switch, rated for 15 amps, 600V, can be installed and connected quickly and efficiently without tools or highly skilled labor.

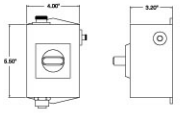
Disconnect Switch	3 Pole	4 Pole	Quantity
15A Switch	SW15-13	SW15-14	1
15A Switch w/Aux contact	SW15-13AUX	SW15-14AUX	1

Specifications		
Mechanical	**Enclosure Dimensions**	5.5" h x 4.0" w x 3.2" d
	Enclosure Material	Polycarbonate
	Receptacle Size	Mini Change® Connector for Drop/Branch cords 23mm Micro Change® Connector for Aux Contact Signal
Electrical	**Amperage Rating**	15A, 600V
	Maximum Horsepower Rating	_ HP @120V, single phase 1.5 HP @ 240V, single phase 5 HP @ 240V, three phase 10 HP @ 480V, three phase 10 HP @ 600V, three phase
	Auxiliary Contact	Normally Open
Environmental	**Protection**	NEMA 12 IP65

Locking Clips



Disconnect Switch



BradPower™
Modular
Power Solutions

Frequently Asked Questions

For more information about Woodhead BradPower™ solutions, contact us by telephone at 800-225-7724 or email at info@woodhead.com. For more extensive FAQs and white papers, visit our web site at www.woodhead.com.

BradPower™
Power without the pipe.™

Q. What is a BradPower solution?

A. Woodhead's BradPower solution is a quick-connect, modular wiring solution comprised of factory-applied connectors over-molded onto cables to provide up to 30A feeder and 15A branch power distribution circuits up to 600V AC/DC.

Q. Where can BradPower products be used?

A. The intended application space for BradPower products includes installations on industrial machinery and in factory settings. In most situations, these applications fall within the scope of NFPA-79 'Electrical Standards for Industrial Machinery'. Applications "where conditions of maintenance and supervision ensure that only qualified persons service the installation", such as industrial environments, are ideal for BradPower installations.

Q. Where should BradPower products NOT be used?

A. BradPower products are not intended to substitute established wiring practices for premise wiring installations in residential or commercial establishments. BradPower products should not be used inside walls or in ceilings.

Q. Are connectors allowed in power circuits?

A. Yes. The BradPower connector system is not considered a splice and is therefore allowed to be used within a power circuit. Section 14.1.2.2 of the NFPA-79, 2002 edition of the Electrical Standard for Industrial Machinery, explicitly mentions that 'factory applied molded connectors' are not splices.

Q. Are BradPower components 'listed' for use in the US and Canada?

A. Yes. Our BradPower product line has been evaluated by UL and listed for use in the US and Canada to the following standards:

for US: UL listed to UL1977, UL498, and UL817 (subj 2238)
for Canada: cUL listed to CSA 22.2 182.3 – M1984.

Q. Can BradPower products be used in motor power circuits?

A. Yes. BradPower products can be used as an alternative to hard wiring methods. BradPower products are passive wiring devices that should be sized for the application and load, just as any other passive wiring device or component should be. Sizing of wiring devices must conform to the requirements of NEC article 430.

Q. What type of connectors are allowed?

A. NFPA-79 lists general requirements for proper connector designs in section 14.4.5. BradPower products comply with these requirements:

NFPA-79 Requirements	BradPower Solution
❑ Attachment plug and receptacle (plug/socket) combinations shall be listed for the intended use and…	❑ BradPower products are UL listed for use in US and Canada
❑ Shall be of the locking type where rated greater than 20 amperes, and …	❑ BradPower threaded coupling nuts offer a way to lockdown connection preventing accidental disconnection.
❑ On circuits of more than 300 volts to ground or 300 volts phase-to-phase, they shall be skirted and constructed to contain any arc generated when a connection is made or broken. (NFPA-79 Section 14.4.5.2)	❑ BradPower connectors are not designed for interrupting power and should not be disconnected while a circuit is energized. However, in the event the BradPower connector is disengaged under load, the likelihood of an electric shock – though possible – is minimized by the skirted female pin design.
❑ Ground pin should first mate / last break (NFPA-79 Section 14.4.5.3).	❑ BradPower connectors provide an extended pin for the ground conductor and therefore meet the requirement for first make/last break.
❑ Where more than one attachment plug and receptacle (plug/socket) combination is used at the same location, they shall be mechanically coded or be clearly identified to prevent incorrect insertion. (NFPA-79 Section 14.4.5.5)	❑ For added flexibility, BradPower connectors are offered in two keying options for mechanically differentiated circuits. Further, 3 and 4 pole versions are not interchangeable. However, this requirement can always be met by the machine builder with proper labeling of the connector and receptacles.

Q. What cable rating do the BradPower cordsets have?

A. For full flexibility and use on various applications, BradPower cordset assemblies have cable with three ratings:

1. **Tray Cable rating plus Open Wiring**—enables exposed use outside the cable tray
   Cable imprint designation: TC/Open Wiring 600V, 90C DRY, 75C WET
2. **Machine Tool Wire**—allows for use in industrial machines
   Cable imprint designation: MTW 600V, 90C
3. **Flexible Cord with Oil Resistance**—rated for outdoor use
   Cable imprint designation: STOOW 600V, 105C

Q. How should BradPower wiring components be sized in motor control applications?

A. BradPower wiring components are rated to 30A, 600V for 10AWG trunk connector and up to 15A, 600V for 14AWG drop or branch connectors. This amperage rating should be applied according to the rules set forth in NEC article 430 for sizing circuits for motor control applications.

Q. Does NFPA-79 or NEC require a locking device to be used in BradPower products installations?

A. No. Neither the NEC nor NFPA-79 codes require the use of a locking device. However, for BradPower products users requiring an explicit precaution or additional margin of safety, Woodhead offers secure, easy to apply clamshell-style, locking clips that limit access to the flexible wiring system and requires a tool to remove.

Q. Can exposed cables be installed on the machine? I thought it had to be inside conduit, cable tray or raceway.

A. The Section 14.1.4.1 of NFPA-79 relaxes the rules on exposed cable. Exposed cable is allowed on the machine if properly supported and attached to the permanent structure of the machine. Even though not explicitly mentioned, proper cable selection must be made to match the expected condition of service.

Q. When using BradPower solutions for motors, do we need a disconnect switch close to the motor?

A. Yes. BradPower solutions are a passive connection system that is not designed to interrupt power, therefore it can not be used as a switch. When BradPower solutions are used, all aspects of the NEC need to be complied with, including the need for a disconnect switch in plain view from the motor. As part of the BradPower system, Woodhead offers an easy to install in-line disconnect switch that complies with this NEC requirement.

Q. Why the multiple ratings on BradPower cables?

A. BradPower cables carry multiple ratings to accommodate a wide variety of applications, including:

Permanent Installations: The TC/Open Wiring and MTW designation allows BradPower cordsets to be used in cable tray systems as well as for permanent exposed-run installations on industrial machinery per NEC article 392 – 'Cable Trays' and respective NEC article 336 – 'Power and Control Tray Cable: Type TC'.

Temporary Installations: The flexible cord STOOW rating allows the same BradPower product to be used for installations allowed under NEC article 400 - 'Flexible Cords and Cables'. The STOOW is a mechanically tougher cable that can be used to connect to temporary equipment, such as fans, lights, etc, and can be placed on the floor exposed to a harsher environment than a TC cable.

Machine Wiring – permanent or temporary: The multiple ratings allow the BradPower cable assemblies to be used virtually anywhere in the machine. The TC and MTW rating allows it to be used inside trays and raceways, while the STOOW and Open Wiring designation for TC allows the cable to run exposed along the structure of the machine while providing the crush and impact resistance of metal clad (MC) cable.

Q. Is tapping into a larger sized conductor with a smaller conductor allowed? Is the use of our QC or MC reducer allowed?

A. Yes. The NEC allows taps of feeder conductors with smaller sized wires. There are provisions and restrictions that must be followed in this situation. For a complete explanation on this topic, refer to our white paper "Proper Application of Taps for General Branch Circuits."