POWERMATE DRILLING RIG POWER CONNECTIONS

The PowerMate offering is designed to support modularity of drilling rig systems by providing safe and reliable power connections for rigging-up and rigging-down equipment quickly and efficiently.

This offering is the ideal rig power connection solution providing:
- Longer product life
- Reduced maintenance
- Enhanced safety
- Easy installation

The PowerMate product offering is also compatible with all UL 1686 listed plugs and receptacles, including:
- Cooper Crouse-Hinds Arktite™
- Appleton Powertite®
- Killark VersaMate®

APPLICATIONS

PowerMate Plugs, Receptacles, and Connectors are used:
- On SCR/VFD houses to provide power to rig equipment such as shakers, agitators, lighting circuits, mud pumps, motors, etc.
- To quickly and efficiently connect power during rig-ups and disconnect power during rig-downs.

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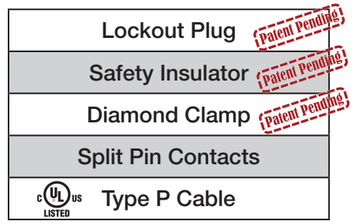
SPECIFIABLE FEATURES



CERTIFICATIONS

- **UL Standards:** UL 1682, UL 1686, NEMA 250
- **CSA Standard:** C22.2 No. 182.1
- Listed for use with Type P cable, flexible cord and cables rated for extra hard usage
- NEMA 4X

STANDARD MATERIALS

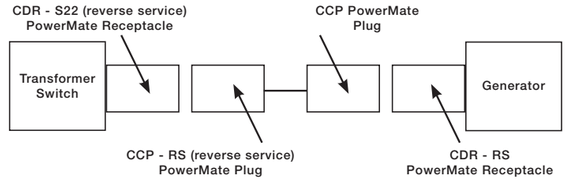
- **Receptacle housing, plug and cord connector bodies** - high impact strength copper-free aluminum (less than 0.4% copper)
- **Back boxes** - cast aluminum
- **Insulation** - fiberglass reinforced polyester
- **Contacts** - naval brass

STANDARD FINISHES

- **Copper-free aluminum** - epoxy powder coat
- **Fiberglass reinforced polyester** - natural (red)
- **Naval brass** - natural

OPTIONS

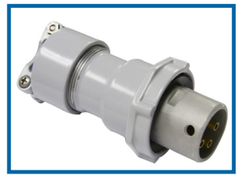
- **-RS...Reverse Service.** Receptacle assembled with plug interior and plug assembled with receptacle interior. For applications where plug is energized to feed normally de-energized receptacle.
  NOTE: 30, 60, and 100A interiors can be interchanged in the field using a screwdriver.

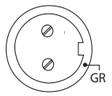
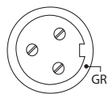
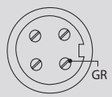
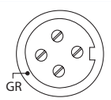


- **-P4...Special Polarity.** Receptacle interior rotated 22 ½ degrees to right and plug changed to match. For use where two or more receptacles of the same ampere rating, style, and number of poles are to be installed in the same area for use on different voltages and/or frequencies. Prevents insertion of a plug in a receptacle with different electrical rating.

Receptacles, Plugs and Connectors

NEMA 4X Watertight
600 VAC / 250 VDC
50 - 400 Hz


DESCRIPTION AND CONFIGURATION:		RECEPTACLE	PLUG		CORD CONNECTOR	
			CABLE RANGE	CAT. NO.	CABLE RANGE	CAT. NO.
2 Wire 2 Pole Style 1		CDR1022	.875-1.906”	CCP1022CD	.875-1.906”	CRC1022CD
2 Wire 3 Pole Style 2		CDR1023	.875-1.906”	CCP1023CD	.875-1.906”	CRC1023CD
3 Wire 3 Pole Style 1		CDR1033	.875-1.906”	CCP1033CD	.875-1.906”	CRC1033CD
3 Wire 4 Pole Style 2		CDR1034	.875-1.906”	CCP1034CD	.875-1.906”	CRC1034CD
4 Wire 4 Pole Style 1		CDR1044	.875-1.906”	CCP1044CD	.875-1.906”	CRC1044CD

Back Boxes (for Receptacles)

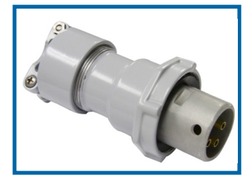
HUB SIZE	CJA	CJA ADAPTER ONLY
½”	CJA310	CJA100
1-¼”	CJA410	
1-½”	CJA510	
2”	CJA610	

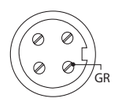
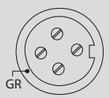
- The back boxes at left are standard with Corro-Free™ epoxy powder coat finish for increased corrosion resistance.
- For optional reversed interior, use suffix **-RS** (see page 3).
- For optional rotated interior, use suffix **-P4** (see page 3).
- For dimensions, see page 11.
- Maximum conductor size (wire well) 0.390” (see page 12).

COOPER Crouse-Hinds

Receptacles, Plugs and Connectors

NEMA 4X Watertight
600 VAC / 250 VDC
50 - 400 Hz


DESCRIPTION AND CONFIGURATION:		RECEPTACLE	PLUG		CORD CONNECTOR	
			CABLE RANGE	CAT. NO.	CABLE RANGE	CAT. NO.
3 Wire 4 Pole Style 2		CDR15034	.875-1.906” 1.250-2.190”	CCP15034CD CCP15034DE	.875-1.906” 1.250-2.190”	CRC15034CD CRC15034DE
4 Wire 4 Pole Style 1		CDR15044	.875-1.906” 1.250-2.190”	CCP15044CD CCP15044DE	.875-1.906” 1.250-2.190”	CRC15044CD CRC15044DE

Back Boxes (for Receptacles) - see page 8.

200 AMP and 400 AMP Arktite™

Receptacles, Plugs and Connectors

200A and 400A options available as part of our Cooper Crouse-Hinds Arktite™ Series

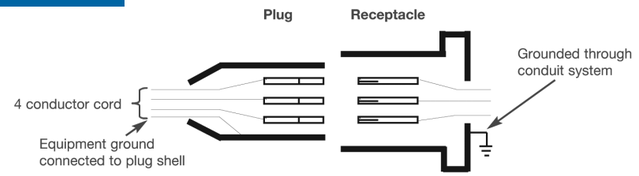
AMPERAGE AND CONFIGURATION:		RECEPTACLE	PLUG	CORD CONNECTOR
200A	2 Wire 3 Pole - Style 2 3 Wire 3 Pole - Style 1 3 Wire 4 Pole - Style 2 4 Wire 4 Pole - Style 1			
400A	2 Wire 3 Pole - Style 2 3 Wire 3 Pole - Style 1 3 Wire 4 Pole - Style 2 4 Wire 4 Pole - Style 1			

For detailed part numbers and technical information, please refer to section 1P of the Cooper Crouse-Hinds catalog.

COOPER Crouse-Hinds

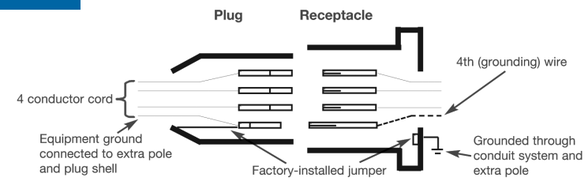
Grounding

Style 1



Style 1 units complete the grounding circuit through the metallic plug shell, receptacle housing, or connector shell.

Style 2



Style 2 metallic units with metal housing have a separate designated ground contact that is bonded to the metallic housing. The metallic housing of the plug, receptacle, or connector forms a parallel ground circuit through the receptacle or connector detent spring.

Electrical Rating Ranges

- **Voltage -** 600 VAC, 50 to 400 Hz; 250 VDC*
- **Amperes -** 30, 60, 100, 150

Maximum Horsepower for Plug and Receptacle Combinations by Input Voltage**
The following values are typical horsepower ratings based on NEC Article 430 tables. HP Ratings are based on the largest conductor size for each plug and receptacle combination per the Wire Size table below.

Ampere Rating Plug and Receptacle	Motor Horsepower **		
	240 Volts	480 Volts	600 Volts
30	15	30	40
60	20	40	50
100	30	60	75
150	40	75	100
200	60	125	150

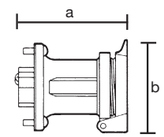
* This guide is for reference only. Consult your local electrical codes before installation.

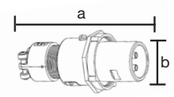
** Cooper Crouse-Hinds recommends circuit breaking use be limited to emergency conditions only and that a horsepower rated switch or Cooper Crouse-Hinds Interlocked Receptacle be used for making and breaking under load.

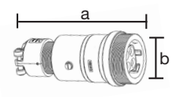
Product Dimensions

Receptacle, Plug, Cord Connector

	CDR Receptacle a	CDR Receptacle b	CCP Plug† a	CCP Plug† b	CRC Cord Connector† a	CRC Cord Connector† b
30A	2-⅞”	3-⅜”	6-½”	2-⅝”	6-⅜”	2-⁹⁄₁₆”
60A 3p	4-¼”	4-½”	8-⅛”	3-⅝”	8-³⁄₁₀”	2-⁵⁄₁₆”
60A 4p	4-¼”	4-½”	8-⅛”	3-¾”	8-³⁄₁₀”	2-⁵⁄₁₆”
100A 3p	5-¼”	4-¼”	10-⅘”	3-¾”	11-½”	3-³⁄₁₆”
100A 4p	5-¼”	4-¼”	10-⅘”	4-⅛”	11-½”	3-⁷⁄₁₆”
150A (CD)	5-¼”	4-¼”	10-⅘”	4-⅛”	11-½”	3-⁷⁄₁₆”
150A (DE)	5-¼”	4-¼”	10-⅘”	4-⅛”	11-½”	3-⁷⁄₁₆”



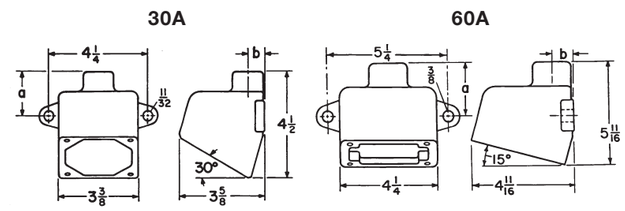




†Dimensions are approximate and vary with cable size.

CEE Back Boxes

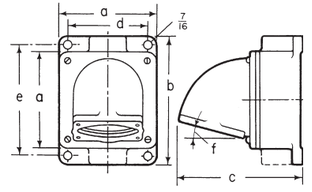
Cat. No.	Rating	Size	a	b
CEE13	30A	½	1-²⁷⁄₃₂”	¹¹⁄₁₆”
CEE23	30A	¾	1-²⁷⁄₃₂”	¹³⁄₁₆”
CEE33	30A	1	1-³¹⁄₃₂”	¹⁵⁄₁₆”
CEE36	60A	1	2-⁹⁄₁₆”	¹⁵⁄₁₆”
CEE46	60A	1-¼”	2-⅝”	1-³⁄₁₆”
CEE56	60A	1-½”	2-¹¹⁄₁₆”	1-⁵⁄₁₆”



CJA

With 60, 100 and 150A Angle Adapters

Cat. No.	Hub Size	a	b	c	d	e	f
CJA310	1”	5-⅞”	8”	7-⁷⁄₁₆”	4-⅞”	7”	15°
CJA410	1-¼”	5-⅞”	8”	7-⁷⁄₁₆”	4-⅞”	7”	15°
CJA510	1-½”	5-⅞”	8”	7-⁷⁄₁₆”	4-⅞”	7”	15°
CJA610	2”	5-⅞”	8”	8”	4-⅞”	7”	15°



- Back boxes are standard with Corro-Free™ epoxy powder coat finish for increased corrosion resistance.
- Thru-feed back boxes are furnished with one close-up plug in bottom recessed hub.
- CJA back boxes are recommended when additional wiring space is required.
- The angle adapter on CJA back boxes can be installed at 90° rotations, making it possible to enter hub from several directions.

Replacement Parts

Standard Replacement Parts

Replacement Interiors 30, 60, 100, 150A

Complete insulator and contact assembly		30A	60A	100A	150A
2W2P	CDR-CRC	CRI-3022	CRI-6022	CRI-1022	---
	CCP	CPI-3022	CPI-6022	CPI-1022	---
2W3P	CDR-CRC	CRI-3023	CRI-6023	CRI-1023	---
	CCP	CPI-3023	CPI-6023	CPI-1023	---
3W3P	CDR-CRC	CRI-3033	CRI-6033	CRI-1033	---
	CCP	CPI-3033	CPI-6033	CPI-1033	---
3W4P	CDR-CRC	CRI-3034	CRI-6034	CRI-1034	CRI-15034
	CCP	CPI-3034	CPI-6034	CPI-1034	CPI-10534
4W4P	CDR-CRC	CRI-3044	CRI-6044	CRI-1044	CRI-15044
	CCP	CPI-3044	CPI-6044	CPI-1044	CPI-15044

Miscellaneous Replacement Parts

Amperage Center	Configuration Center	CDR Spring Cover	CDR Threaded Cover	CCP Fastening Ring	Bushings Kits Center
30A	2-pole, 3-pole 4-pole	PTSC30	PTTC30	CLMPR30	PTGB30
60A	2-pole, 3-pole 4-pole	PTSC60A PTSC60B	PTTC60A PTTC60B	CLMPR23P60 CLMPR4P60	PTGB60
100A	2-pole, 3-pole 4-pole	PTSC100A PTSC100B	PTTC100A PTTC100B	CLMPR23P100 CLMPR4P100	PTGBCD
150A	4-pole	PTSC150B	PTTC150B	CLMPR4P150	PTGBCD (CD Size) PTGBCD (DE Size)

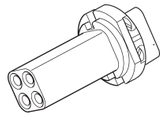
Wire Sizes

The table below lists the diameter of the wire recess in PowerMate plug and receptacle contacts so that maximum size of bare conductor can be determined. Range of wire sizes shown in table are intended only as a guide. Depending on type of wire used (building wire, flexible or extra flexible cable) and its construction (number and size of strands), bare copper diameters vary widely.

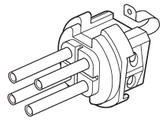
Diameter of Wire Recess in Plug & Receptacle Contacts

Amperage Rating	Contact Type	Diameter of Recess	Wire Size †† Extra Flex
30 (2, 3, & 4-pole)	Pressure	.281”	#10-#8
60 (2, 3, 4-pole)	Pressure	.312”	#8-#4
100 (2, 3, & 4-pole)	Pressure	.390”	#4-#2
150 (4-pole)	Pressure	.390”	#2-1/O

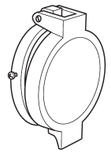
††Do not use wire size smaller than minimum size recommended.



CRI Receptacle & Connector Interior



CPI Plug Interior



Spring Cover

Threaded Cover

Bushing Kit

PowerMate™ Part Numbers

CCP | 30 | 3 | 4 | BC | — | RS

PRODUCT TYPE
CCP - Plug
CDR - Receptacle
CRC - Connector
CDRE - Receptacle with CEE Back Box
CDJA - Receptacle with CJA Back Box

AMPERAGE
30 - 30 Amp
60 - 60 Amp
10 - 100 Amp
150 - 150 Amp
(200 & 400 Amp options avail. as part of Arktite Series)*

WIRE
2 - 2-Wire
3 - 3-Wire
4 - 4-Wire

POLE
2 - 2-Pole
3 - 3-Pole
4 - 4-Pole

CABLE RANGE **
(plug and connector only)
BC - 0.390” to 1.375”
CD - 0.875” to 1.906”
DE - 1.250” to 2.190”
E - 1.875” to 2.500”
F - 2.500” to 3.000”
G - 3.000” to 3.500”

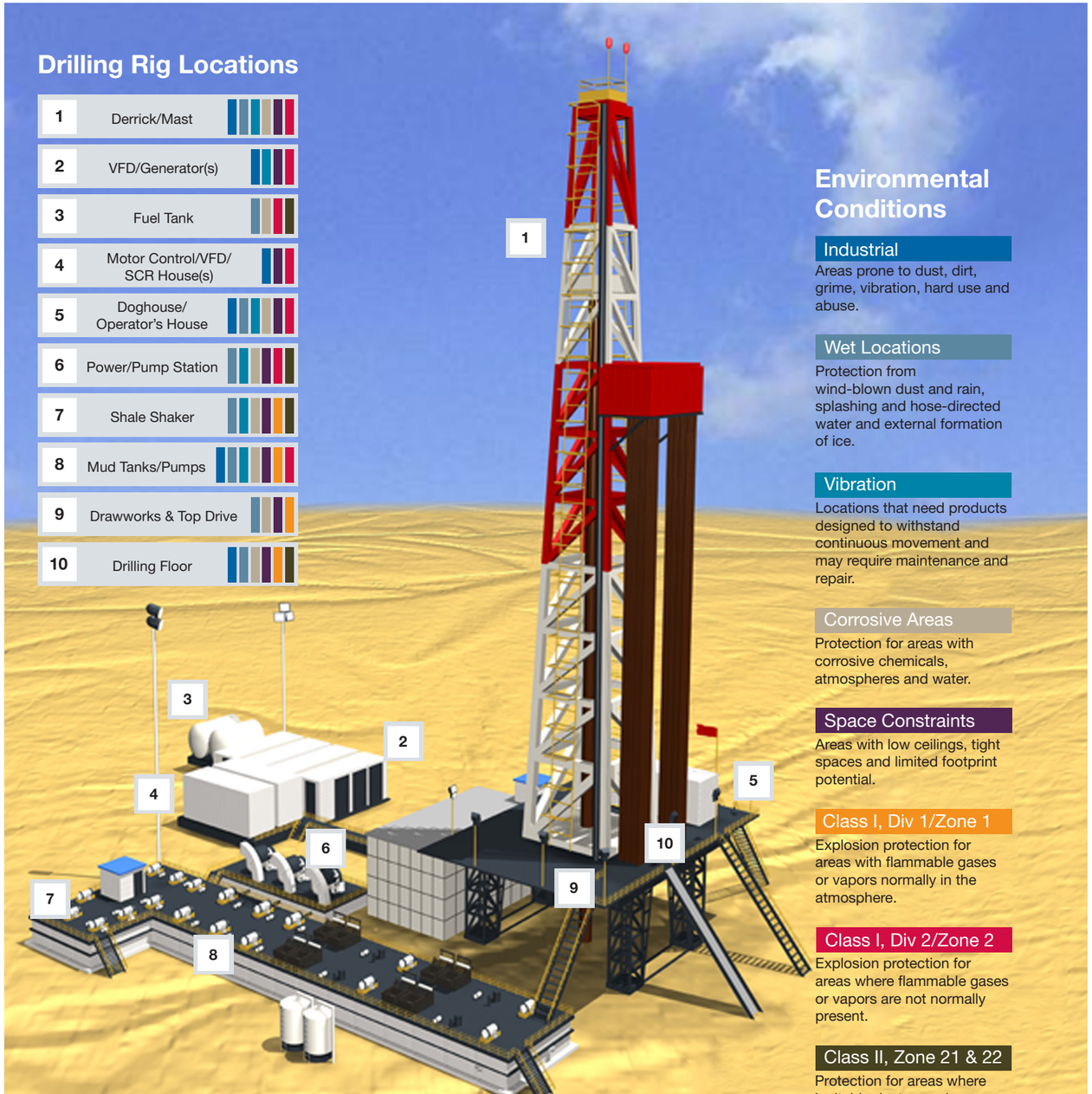
HUB SIZE***
(receptacle with back box only)
50 - ½”
75 - ¾”
100 - 1”
125 - 1-¼”
150 - 1-½”
200 - 2”
250 - 2-½”
300 - 3”
350 - 3-½”
400 - 4”
500 - 5”

OPTIONS
RS - Reverse Service
P4 - Special Polarity

* Refer to section 1P of the Cooper Crouse-Hinds catalog.
** Cable Range only applies to specific plug part numbers.
*** Hub size only applies to specific receptacle part numbers.

Drilling Rig Locations

1. Derrick/Mast
2. VFD/Generator(s)
3. Fuel Tank
4. Motor Control/VFD/ SCR House(s)
5. Doghouse/ Operator’s House
6. Power/Pump Station
7. Shale Shaker
8. Mud Tanks/Pumps
9. Drawworks & Top Drive
10. Drilling Floor



Environmental Conditions

Industrial
Areas prone to dust, dirt, grime, vibration, hard use and abuse.

Wet Locations
Protection from wind-blown dust and rain, splashing and hose-directed water and external formation of ice.

Vibration
Locations that need products designed to withstand continuous movement and may require maintenance and repair.

Corrosive Areas
Protection for areas with corrosive chemicals, atmospheres and water.

Space Constraints
Areas with low ceilings, tight spaces and limited footprint potential.

Class I, Div 1/Zone 1
Explosion protection for areas with flammable gases or vapors normally in the atmosphere.

Class I, Div 2/Zone 2
Explosion protection for areas where flammable gases or vapors are not normally present.

Class II, Zone 21 & 22
Protection for areas where ignitable dusts may be present.

Please refer to your own company documentation for exact specifications and environmental conditions.

Plug and Receptacle Solutions for Land-Based Drilling

Product Photo	Product Solutions	Env. Conditions	Rig Location
	**PowerMate Series** • Supplies power to portable devices such as motor generator sets, compressors, heating/cooling, welders and lighting from 30 to 150A • NEMA 4X copper-free aluminum construction with epoxy powder coat finish is ideal for harsh environments • Arc-snuffing design enables large power loads to be disconnected under load without an arc flash (up to 100 amps) • 360° split pin contact reduces heat rise and eliminates arcing • Lockout/tagout hole in plug to ensure it cannot be inserted into receptacle when maintenance is being performed downstream	Industrial Wet Locations Vibration Corrosive Areas Space Constraints	2, 4, 5
	**ENR & ENP Series** • Explosionproof outlet for convenience and lighting connections, 20A MAX • Factory-sealed chamber encloses potential arcing components between two explosionproof threaded joints • Frustration-free ENP with captive set screws assures ease of installation and reduces likelihood of losing critical components in the field • ENRM4 Series with gasketed screw cap cover offers features that protect interior from harsh environments, provide time saving saddle clamp terminals, and improved safety with lockout/tagout hole	Industrial Vibration Space Constraints Class I, Div 1/Zone 1 Class I, Div 2/Zone 2	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
	**FSQC & EBBR Series** • Interlocked units with dead front receptacles ensure connection cannot be made or broken under load, increasing safety and protection • PowerMate plugs can be used with both FSQC (30-60A) & EBBR (30-100A) Series to provide ultimate flexibility of portable equipment used throughout the rig • FSQC units are interlocked with switches and the EBBR Series is interlocked with circuit breakers for added protection	Industrial Wet Locations Vibration Corrosive Areas Space Constraints Class I, Div 1/Zone 1 Class I, Div 2/Zone 2	4, 7, 8, 10
	**CES & CPH Series** • Equipped with a delayed action rotating sleeve which prevents complete withdrawal of CPH plug in one continuous movement • The delayed action feature permits the plug to be used as an emergency push-pull switch • Receptacles are factory sealed to simplify installation and eliminate the need for external seals • Available in 30 and 60A • CPH also mates with FSQC, EPC, and EBBR receptacles of matching configuration	Industrial Wet Locations Vibration Corrosive Areas Space Constraints Class I, Div 1/Zone 1 Class I, Div 2/Zone 2	7, 8
	**eXLink® Connectors** • Signal and power connections can be switched under load • Reduces installation time, providing maintenance and labor savings • Can be factory installed and pre-wired with Cooper Crouse-Hinds industry leading light fixtures • Rated up to max. 16A and up to 400V	Industrial Wet Locations Vibration Corrosive Areas Space Constraints	1, 10
	**IEC 309 GHG 51 Series** • Supplies power to portable devices with requirements of 16-125A • Reinforced polyester construction offers reliability from -20° to +55°C • Integrated AC3 rated disconnect switch	Wet Locations Vibration Corrosive Areas Class I, Div 2/Zone 2	7, 8, 9
	**Roughneck™ Connectors** • For use with single conductor 313-777 MCM cable, 1000 volts AC/DC, rated up to 1135A • Designed for heavy abuse - resistant to rain, mud and oil • Quickly connects and disconnects without any tools • Superior safety protection with totally shielded contacts • Color-coded insulators for easy identification to prevent reverse phasing in AC and cross polarization in DC • Mated assemblies are lockout/tagout compatible	Industrial Wet Locations Vibration Corrosive Areas Space Constraints	2, 4, 5, 6, 9, 10
	**Pauluhn™ 80/86/96/wd (NRL) Connectors** • Watertight ANSI NEMA type receptacle • Accepts standard ANSI NEMA type plugs • Mating plugs with integral threaded ring maintain a watertight seal • Available in seven different voltage configurations up to 20A • Captive threaded receptacle cap	Industrial Wet Locations Vibration Corrosive Areas Space Constraints	1, 2, 4, 5, 7*, 8
	**Pauluhn™ PPR Series Connectors** • Watertight non-metallic construction including water shedding receptacle design • Corrosion and impact resistant closure • Captive threaded receptacle cap • 2P3W and 3P4W available in single or double gang types and with an in-line connector set up to 20A • Double gang receptacle provided with pre-stripped leads • Inter-mateable with other brands	Industrial Wet Locations Corrosive Areas	2, 4, 5

* On enclosed rigs.