Products & solutions for land-based drilling
Engineered rig-tough

Your job is hard enough... Crouse-Hinds solutions can make it easier

Whether it’s portable or fixed, you need solutions that stand up to the environmental and physical demands of land-based drilling. Eaton’s Crouse-Hinds engineers easy-to-install and operate product solutions to meet your challenges head on while providing future-proof flexibility for new builds and retrofits.
 Products & solutions
engineered for land-based drilling

**LED lighting**
Maintenance-free and energy-efficient
The broadest portfolio of LED luminaires for any industrial or hazardous application.

**Control & apparatus**
Flexible and modular solutions
Innovative, intelligent NEC and IEC solutions safely and efficiently control power and protect circuits in explosive, wet and corrosive environments worldwide.

**Hazardous area communications**
Signaling and solutions for hazardous areas
Audible and visual signaling solutions for use in hazardous locations; designed to ensure day-to-day reliability and increase safety in emergencies.

**Fluorescent & HID lighting**
Durable and energy-efficient
Proven technology, technical support and global certifications with an unmatched selection of luminaires.

**Cable glands & fittings**
Rugged connectors for extreme conditions
Time-tested, innovative conduit fittings, cord connectors and cable glands move power where you need it simply and safely in any electrical installation.

**Instrumentation, monitoring and software**
Your single source supply
Unified approach to intrinsic safety, explosionproof techniques and monitoring.

**Plugs & receptacles**
Simple and secure powering solutions
Extensive configurations, custom capabilities and numerous interlocked designs provide safe and reliable solutions for fixed and portable power applications in industrial and hazardous environments.

**ACE series variable frequency drives**
Installation savings and improved performance
Designed to meet the high reliability and safety requirements of process industries such as oil and gas.

**Cable management & safety grating**
Field flexibility and labor saving design
Structural steel-saving cable management designs and safety grating for slip-resistant walkways.
Full portfolio of land-based drilling solutions

Know your challenges
Setting the standard for safety and reliability
This illustration highlights many of the common environmental challenges faced when designing, constructing and running a land-based drilling platform.
Find the right solution
Every platform presents unique hurdles and opportunities, and Eaton’s Crouse-Hinds is there to offer customized solutions tailored to individual customers.

1. Derrick/mast
   - Products used: LED, fluorescent & HID lighting, plugs & receptacles, control & apparatus, cable glands & fittings, hazardous area communications, cable management & safety grating

2. VFD/generators
   - Products used: LED, fluorescent & HID lighting, plugs & receptacles, control & apparatus, cable glands & fittings, hazardous area communications, cable management & safety grating

3. Fuel tank
   - Products used: LED, fluorescent & HID lighting, plugs & receptacles, control & apparatus, cable glands & fittings, hazardous area communications

4. Motor control/SCR house
   - Products used: LED, fluorescent & HID lighting, plugs & receptacles, control & apparatus, cable glands & fittings, hazardous area communications, cable management & safety grating

5. Doghouse/operator's house
   - Products used: LED, fluorescent & HID lighting, plugs & receptacles, control & apparatus, cable glands & fittings, hazardous area communications, cable management & safety grating

6. Power/pump station
   - Products used: LED, fluorescent & HID lighting, plugs & receptacles, control & apparatus, cable glands & fittings, ACE Series VFDs, hazardous area communications, cable management & safety grating

7. Shale shaker
   - Products used: LED, fluorescent & HID lighting, plugs & receptacles, control & apparatus, cable glands & fittings, ACE Series VFDs, hazardous area communications, cable management & safety grating

8. Mud tanks/pumps
   - Products used: LED, fluorescent & HID lighting, plugs & receptacles, control & apparatus, cable glands & fittings, ACE Series VFDs, hazardous area communications, cable management & safety grating

9. Drawworks & top drive
   - Products used: LED, fluorescent & HID lighting, plugs & receptacles, control & apparatus, cable glands & fittings, ACE Series VFDs, hazardous area communications, cable management & safety grating

10. Drilling floor
    - Products used: LED, fluorescent & HID lighting, plugs & receptacles, control & apparatus, cable glands & fittings, hazardous area communications, cable management & safety grating

11. Perimeter
    - Products used: LED, fluorescent & HID lighting, plugs & receptacles, control & apparatus, cable glands & fittings, hazardous area communications

INDUSTRIAL
- Areas prone to dust, dirt, grime, vibration, hard use and abuse

WET LOCATIONS
- Protection from windblown 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/ZONES 21 & 22
- Protection for areas where ignitable dusts may be present
LED lighting solutions

Offering the broadest portfolio of LED luminaires for industrial or hazardous applications

We utilize more than 100 years of lighting expertise to optimize the benefits of LED technology to offer the safest and most reliable LED luminaires on the market.

Whether you need to light a derrick or multiple pump jacks, we have a solution that will exceed your needs. Featuring high performance LEDs and a solid state electronic driver, our LED luminaires improve energy consumption and reduce maintenance for relamping.

Pauluhn® DLL linear LED luminaires

Application

The Pauluhn DLL linear LED by Eaton’s Crouse-Hinds is specifically designed to replace fluorescent T12, T8 and T5HO lighting on land-based and offshore drilling platforms. The rugged and durable design features the industry’s most versatile and flexible mounting options. The Pauluhn DLL is the ideal solution for high vibration, impact and hose down in drilling applications.

Rig locations

Derrick/mast, perimeter, shale shaker, mud tanks/pumps, SCR house and motor control.

Certifications

• Class I, Division 2, Groups A, B, C, D
• Class I, Zone 2
• Class II, Groups E, F, G
• Class III

Features

• Industry-leading efficacy: up to 130 LPW
• -40°C to +65°C ambient operating temperature
• Ultra slim (less than 3” height) low profile fixture
• Versatile ceiling/swivel, wall, flush, pole and pendant mounting options
• Standard wide and optional narrow optics for uniform illumination in control room and drill mast
• Four points of secondary retention and through feed wiring options
• Ability to withstand 2,000 psi of hose pressure from a 5 foot distance and 5G 3-axis vibration
• Emergency battery back-up (90 minutes) and surge protection options (up to 10kV)

Model Length Lumens Watts Lumens per Watt
DLL2 2 ft. 3,600 29W 124W
DLL4 4 ft. 7,100 54.5W 130W

Versatile mounting options:
Pauluhn™ DFL floodlights

**Application**
Pauluhn DFL floodlights are designed to provide full-spectrum, crisp, white light. Two versions of the DFL LED are available from 11,000 to 13,000 lumens, providing ideal solutions for a wide range of applications.

**Features and certifications**
- High brightness LEDs
- Color temperature: cool white (5000K)
- Heat sink design ensures high efficiency (100 lpw) and sustained lumen performance
- Provides reliable operation in the harshest environments

Champ® VMV LED luminaires

**Application**
Champ® VMV series luminaires are designed to provide full-spectrum, crisp, white light with custom Type I, III and V distribution.

Seven versions of the VMV series are available, providing ideal solutions for a wide range of applications.

**Features and certifications**
- High brightness LEDs
- Color temperature: warm and cool options available
- Advanced heat sink design ensures low LED junction temperature and sustained lumen performance
- Redundant drivers provide reliable operation in the harshest environments
- Safety cable compatible
- Certifications: Class I, Division 2, Groups A, B, C, D; Class I, Zone 2; nA nR; Class II, Groups E, F, G; Class III; UL Listed and CSA Certified; IECEx/ATEX; Simultaneous Presence; Type 4X; IP66; Wet Location

Pauluhn™ ZPL linear LED luminaires

**Application**
Pauluhn™ ZPL explosionproof linear LEDs are specifically designed to replace fluorescent T12, T8 and T5HO lighting on marine vessels and land-based and offshore drilling platforms. The rugged and durable design features the industry’s most versatile and flexible mounting options. The ZPL is the ideal lighting solution for high vibration, impact and hose down in drilling applications.

**Features and certifications**
- Industry-leading efficacy: up to 120 LPW
- -25°C to +55°C ambient operating temperature
- Low profile fixture (<5” height)
- Flush and swivel mount options
- Four points of secondary retention and loop feed wiring
- 2,000 psi high pressure hose rated
- 5G vibration rated
- 2kV surge protection
- Certifications: Class I, Division 1, Groups C, D; Class II, Division 1, Groups E, F, G; Class III; NEMA 4X; IP66; Marine and wet locations; Paint spray rated; UL Listed and CSA Certified

Vaporgard™ LED luminaires

**Application**
Vaporgard™ LED series luminaires provide uniform crisp, white light and are suitable for lower mounting heights, confined spaces or utility rooms. Using four high brightness LED arrays, this fixture can deliver similar light levels to 150 watt incandescent lamps.

**Features and certifications**
- High brightness LED arrays
- Color temperature: warm and cool options available
- Advanced heat sink design ensures low LED junction temperature and sustained lumen performance
- 22W LED system can save up to 85% in energy costs
- Array complies with requirements of IEC LM80
- Certifications: Class I, Division 2, Groups A, B, C, D; Class II, Division 1, Groups F, G; UL Listed and CSA Certified; IECEx/ATEX; NEMA 4X; IP66; Marine and Wet Locations
Fluorescent & HID lighting solutions

Delivering installation savings, energy conservation and improved performance

As a leading supplier of area and emergency lighting solutions for installation in hazardous locations and corrosive environments, Pauluhn™ products are specifically designed for drilling and other high abuse applications. Wherever reliable, cost-effective lighting is critical to the safe, secure and productive functioning of your operation, you can count on Pauluhn by Eaton’s Crouse-Hinds.

Pauluhn™ DuraPro linear fluorescent luminaires

Application
Hazardous area luminaire designed specifically for extreme environments such as drilling.
Shock- and vibration-resistant with spring loaded lampholders and integral primary and secondary retention points for safety.

Rig locations
Derrick/mast, perimeter, shale shaker, mud tanks/pumps, SCR house and motor control.

Certifications
- Class I, Zone 2, Groups IIA, IIB, IIC
- Class I, Division 2, Groups A, B, C, D
- Class II, Division 2, Groups F, G
- Class III
- IP66

Features
- Spring loaded lampholders for linear lamps resist shock and vibration
- Acrylic lens withstands constant exposure to sunlight and contact with petroleum-based products
- Neoprene gasket resists petroleum
- Permanent safety cable mounting points at each end
- Extruded aluminum body and cast aluminum end caps

Secondary retention cable available with all luminaires

Mounting options available on all products

<table>
<thead>
<tr>
<th>Model</th>
<th>Length</th>
<th>No. of lamps</th>
<th>Lamp wattage</th>
<th>Lamp type</th>
<th>Voltage/ freq.</th>
<th>Mounting style</th>
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<tr>
<td>DP42871L</td>
<td>4 foot</td>
<td>4</td>
<td>60W</td>
<td>T12 HO</td>
<td>120-277V 50/60 Hz</td>
<td>Surface/ Ceiling</td>
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<tr>
<td>DP42571L</td>
<td>4 foot</td>
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<td>54W</td>
<td>T5 HO</td>
<td>120-277V 50/60 Hz</td>
<td>Surface/ Ceiling</td>
</tr>
</tbody>
</table>

EATON’S CROUSE-HINDS Drilling solutions for land-based rigs
Pauluhn™ ZonePro linear fluorescent luminaires

Application
Pauluhn™ ZonePro (Performer) series linear fluorescent luminaires are an ideal choice for Class I, Divisions 1 and 2 areas.

Features & certifications
- High output luminaire, up to 40,000 raw lumens
- Provided with 4100°K, low mercury TPLC compliant lamp
- Impact-resistant borosilicate glass tubes
- Adjustable mounting brackets allow 110° range of aiming positions
- Available with (2) T5 HO lamps in each globe assembly
- Integral safety cable mounting points for secondary retention
- Certifications: Class I, Division 1, Groups C, D; Class I, Division 2, Groups A, B, C, D; Class I, Zone 1, Groups IIA, IIB; Class II, Divisions 1 & 2, Groups E, F, G; Class III

Pauluhn™ MagnaPro non-metallic linear fluorescent luminaires

Application
Heavy duty luminaire for hazardous and harsh environments. Designed for ease of removal for quick set up/tear down when time is of the essence.

Features & certifications
- Optional slide-in mounting bracket for ease of removal
- Tool-less entry via heavy duty twist draw latches
- UV and impact-resistant polycarbonate drop lens
- Neoprene gasket resists petroleum
- Extruded aluminum housing with cast aluminum end caps
- Spring loaded lampholders for linear lamps resist shock and vibration
- Certifications: Class I, Division 1, Groups C, D; Class I, Division 2, Groups A, B, C, D; Class I, Zone 2, Groups IIA, IIB, IIC; Class II, Division 2, Groups F, G; Class III; Type 4; Conforms to IP66

Pauluhn™ RigPro linear fluorescent luminaires

Application
Designed for hazardous areas in land drilling extreme harsh environments.

Features & certifications
- Ballast anchor point facilitates easy ballast replacement without removing fixture from service
- Dual spring loaded lampholders provide resistance to shock and vibration
- Permanent safety cable attachment points at each end
- Housing and lens frame fabricated from aluminum sheet metal
- Field replaceable lens, ballast and lampholders
- Neoprene gasket resists petroleum
- Certifications: Class I, Division 2, Groups A, B, C, D; Class I, Zone 2, Groups IIA, IIB, IIC; Class II, Division 2, Groups F, G; Class III; Type 4; Conforms to IP66

Pauluhn™ HazFlood DFL/al floodlights

Application
Rugged and durable metal halide floodlight with heavy duty die cast aluminum components, finished with Corro-Free™ epoxy powder coat and stainless steel hardware.

Features & certifications
- 175 - 400W metal halide with pulse start
- 150 - 400W high pressure sodium
- AEx nR, Ex nR restricted breathing rating is standard—restricted breathing offers cooler T-numbers for increased hazardous locations suitability
- NEMA 7x6 butterfly beam floodlight pattern—wide, uniform and far reaching to provide excellent efficiency and more light where you need it
- Certifications: Class I, Division 2, Groups A, B, C, D; Class I, Zone 2, AEx nR II; Class II, Division 1, Groups F, G (250W max); Ex nR II; NEMA Type 4X; IP66; Wet Locations; Marine Locations
Plugs & receptacles

Simple and secure portable and fixed powering solutions

Eaton’s Crouse-Hinds plugs, receptacles and connectors feature rugged construction, extensive configurations, custom capabilities and numerous interlocked designs. Engineered to provide safe and reliable powering solutions for rigging up and rigging down equipment, portable power solutions and for powering lighting systems.

PowerMate™ pin & sleeve connectors

Application

PowerMate™ receptacles are used to quickly and efficiently connect power during rig-ups and disconnect power during rig-downs. Ideal for use on SCR/VFD houses to provide power to rig equipment such as shakers and agitators.

Rig locations

VFD/generators, motor control/SCR house, doghouse/operator’s house.

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

Features

- Lockout plug guarantees isolated power supply with OSHA compliant lockout/tagout
- Fixed safety insulator prevents electrical shocks and shorts
- 8-point diamond cable clamps provide 8 points of contact for increased grip and even pressure distribution
- Split pin contact design provides nearly 360° of contact at every insertion
- Mates with Crouse-Hinds Arktite®, Appleton® Powertite and Killark® Versamate

SCR House

Rig Equipment (shaker, agitator, lighting etc.)
PowerGard™ plugs & receptacles for lighting

Application
PowerGard™ receptacles are used to supply power to lighting systems and lighting panels on land-based drilling rigs.

Exclusive features
- Extended temperature range: -50°C to +55°C
- Saddle clamp wire terminals
- NEMA 3RX rating
- Krydon® fiberglass-reinforced polyester faceplate

Features & certifications
- Classified for use with Appleton® U-Line Series
- Easy-to-wire saddle clamp terminals reduce installation time and effort
- Molded-in-place phase/ground markings reduce installation errors
- Audible on-off position clearly identifies when unit has been engaged and disengaged
- Clearly marked operating instructions to eliminate risk of improper operation
- Certifications: Class I, Groups B, C, D; Class II, Groups E, F, G; Class III; UL Listed and CSA Certified

Roughneck® multi-pin & single pole plugs & receptacles

Application
CEX and CZ series multi-pin and single pole connectors are ideal for heavy duty control and instrumentation, and single pole power for hazardous and non-hazardous areas.

Features & certifications
- Reversible inserts are compatible with all panel mount, in-line, male, and female shells
- Exclusive visual mating alignment improves installation time
- Easily accessible wire terminals
- Reversible 8-point diamond cord grip relieves strain on conductors (patent pending)
- Suited for use with Type P cable
- Impact-resistant
- Superior protection against moisture and environmental contaminants
- Hex grip on hazardous connectors facilitates torquing
- Certifications: IECEx Ex d IIC T5 GB Ex tb IIIC T85°C Db; ATEX II 2 GD Ex d IIC T5 GB Ex tb IIIC T85°C Db; CE marked; IP66, IP68; NEMA 4X, 6P

Cam-Lok "J" series single pole connectors

Application
Cam-Lok “J” series provides the means to quickly connect and disconnect power systems safely. Cam-Lok is the industry standard for motors, generators, lighting distribution panels, and numerous other power applications.

Features & certifications
- Double cam principle provides a positive, vibration-proof connection
- No moving contact surfaces, eliminating arcing or burning
- Locked contacts will withstand a pulling force of 1,000 lbs.
- Color-coded for easy phase identification
- Recessed contacts protected by insulating jacket for safety
- Integrated strain relief system
- Certifications: Listed to UL498, File No. E67181; CSA certified to C22.2 No. 182.3 LR13963; NEMA 3R or NEMA 4

Roughneck® single conductor plugs & receptacles

Application
Designed specifically for the oil and gas industry, Roughneck® plugs and receptacles are built to take heavy abuse while providing a simple, secure and safe connection.

Features & certifications
- Receptacle bus bar can be mounted in the vertical, horizontal or 45° angle position for ultimate flexibility
- Industry exclusive stainless steel rotating latch provides a tool-free, secure connection, also available in short throw configuration
- Lockout/tagout compatible
- Epoxy powder coated shells provide superior corrosion resistance, color coded to prevent cross-phasing
- Male contacts are equipped with Cam-Lok™’s safe front insulated tip
- Specially plated copper contacts provide minimum resistance and heating

Electric Ratings:
- 1000 volts, MAX AC/DC; 1135 Amps Continuous (1300 Amps intermittent)
- Certifications: cURus: E73864; NEMA 3
Control & apparatus

Flexible, modular solutions engineered to your specifications

Eaton’s Crouse-Hinds is continuously developing innovative, intelligent and engineered to order NEC and IEC solutions to control power and protect circuits in land-based drilling applications.

Crouse-Hinds’ controls are specifically designed for safe and efficient use in explosive, wet and corrosive environments worldwide.

EMN 25 & 26 pushbutton motor starters

Application
Explosionproof, compact, across-the-line Manual NEMA starter for single and polyphase VAC or VDC motors.
- Used on drilling rigs for mud agitators and shakers where flammable or explosive gases are present
- Also used for fans and blowers, pumps, compressors and conveyors

Rig locations
All locations.

Certifications
- Class I, Divisions 1 & 2, Groups C, D
- Class II, Divisions 1 & 2, Groups E, F, G
- Class III
- UL Standard: 1203
- cUL Standard: C22.2 No. 30
- IEC rated version also available

Features
- Built to protect from mud and hose-directed water - NEMA 4
- Robust protection for start-stop buttons
- Option for no top entry for further protection from water ingress
- Pushbutton can be locked in “OFF” position
- Versatile mounting footprint accommodates field retrofit
NEMA 4X enclosures

**Application**
Broad offering of JIC, wall mount, ground mount and free-standing enclosures with superior ingress protection. Protects against corrosion, circulating and windblown dust, falling dirt, dripping non-corrosive liquids, rain, splashing water and hose-directed water.

**Features & certifications**
- Type 4X enclosures have poured in place gasket for superior ingress protection
- 316 or 304 stainless steel with brushed finish for superior corrosion resistance
- Certifications: Conforms to NEMA Standard for Type 4, 4X, 12, 13; UL Listed and CSA Certified

ECP explosionproof enclosures

**Application**
Explosionproof control panels are used as classified enclosures, pull boxes or control panels in rigid conduit systems and with metal clad cable rated for hazardous locations. UL/cUL certified for field addition of drilled and tapped entries on sides, top and bottom of enclosure. Field addition of device holes on cover are also permitted.

**Features & certifications**
- Bolt-on/tap-in mounting feet for easy field replacement
- Stroke-sanded finish creates smooth finish for easy installation of pushbutton/pilot light operators
- Standard neoprene gasket standard in all sizes and provides NEMA 4X rating
- Standard internal mounting pads
- Entries up to 3' in diameter
- Certifications: Class I, Division 1 & 2, Groups B, C, D; Class II, Divisions 1 & 2, Groups E, F, G; Class II, Division 2, Groups F, G; Class III; NEMA Type 3, 3R, 4, 4X, 7BCD, 9EFG; UL Listed and CSA Certified

D2PB circuit breaker panelboards

**Application**
Designed specifically for use in hazardous areas where flammable vapors or gases may be present due to accident or abnormal locations. Indoors or outdoors in Division 2 areas of petroleum refineries and petrochemical plants.

**Features & certifications**
- Interior sub-assembly is removable as a complete unit
- Circuit breakers are contained in compact, individual factory sealed enclosures suitable for Class I, Division 2, Groups C, D hazardous areas
- Tapped conduit openings are provided for main conduit and branch circuits
- Gasketed main cover and door excludes dirt and moisture
- Certifications: Class I, Division 2, Groups C, D; NEMA: 3, 7CD (Division 2), 12; UL Listed

EDS explosionproof combination pushbutton and pilot light control stations

**Application**
Used for manual AC or DC motor control, EDS control stations are factory sealed enclosures which prevent arcing of enclosed device in hazardous areas. Modular control stations gangable enclosures allow for reduced installation costs.

**Features & certifications**
- Factory sealed to reduce installation problems, eliminate external seals, lower installation costs and improve safety
- Used with general purpose snap and pushbutton type switches
- Standard neoprene covers for front operated pushbuttons prevents accumulation of debris and water around operating shafts
- Modular design allows all controls to be located in one central area
- Certifications: Class I, Division 2, Groups B, C, D; Class II, Division 1, Groups E, F, G; Class II, Division 2, Groups F, G; Class III; NEMA/EEMAC 3, 7BCD, 9EFG; UL Listed and CSA Certified
Safe, secure and versatile connections for electrical installations

Featuring extensive configurations, custom capabilities and numerous designs, Eaton’s Crouse-Hinds’ electrical connectivity solutions give you field flexibility to design, build and maintain your rig’s electrical plant.

Our time-tested, innovative products move and secure power where you need it, simply and safely, in any electrical installation.

ADE armoured & non-armoured cable glands

**Application**
ADE series glands are used to terminate armoured and non-armoured cable in hazardous locations.

**Rig locations**
All locations.

**Certifications**
- ATEX LCIE 97/ATEX 6008X - Exd IIC/Exe II/Ex tD/Ex II 2 GD
- IECEx LCI 05.0004X
- cULus Listed for Class I, Zone 2 AEx de II/Ex de II
- cULus Marine Listed for Class I, Division 1, Groups A, B, C, D
- NEMA 4X and IP68
- CEPELEX-5/58/05X
- GOSTR POCF FR Bo2011
- NEPSI N°'s GYJ071336U & GYJ071337U
- ABS approbation: n° 10-HS 577243-PDA / P1836754-X
- DNV N° E-10892
- Lloyds

**Features**
- Standard material: nickel-plated brass for superior corrosion resistance
- Provides flameproof and weatherproof seal on outer sheath of cable
- Explosionproof compound seal (denoted by red back nut) on conductors
- Deluge boot provides enhanced protection from water ingress
- Standard neoprene seal suitable for use in operating temperatures -60°C (-25°C UL) to 80°C
- Available with metric or NPT threads
Cable glands & accessories

Eaton’s Crouse-Hinds cable glands are used in land-based drilling applications throughout the world. Our global offering provides a termination solution for virtually every type on the market. These cable glands are designed for strict adherence to global specifications, meeting North American and international codes and standards including NEC, CEC, ATEX, IECEx and regional certifications. Available in a wide range of materials including nickel-plated brass, stainless steel, aluminum and impact-resistant nylon.

**Cable types**
- Unarmoured
- Tray and Type P Cable
- Steel Wire Braided (SWB)
- Steel Wire Armour (SWA)
- Steel Tape Armour (STA)
- Metal Clad (MC)
- TECK
- Lead Sheath

**Materials**
- Nickel-plated brass
- Aluminum
- Brass
- Steel
- Stainless 304 and 316
- Plastic
- Neoprene and silicone seals

**Certifications**
- cULus Marine
- cUL
- IECEx
- ATEX
- American Bureau of Shipping
- Det Norske Veritas
- Lloyds Register
- CEPEL
- NEPSI
- GOST

**Terminator™ II TMCX armoured barrier & non-armoured barrier gland**

**Application**
The Terminator™ II TMCX cable gland is an armoured barrier, non-armoured barrier and TECK armoured gland used to terminate cable in hazardous locations. Its unique design features, coupled with our new fast curing Chico® LiquidSeal compound, make the Terminator II TMCX the easiest and safest solution available.

**Features & certifications**
- Designed to minimize the opportunity for incorrect assembly
- Full coverage of all popular cables and hub sizes, ensuring a perfect seal in all instances
- Nickel-plated brass and stainless steel for corrosion resistance
- Chico® LiquidSeal, compound with fast gel and cure times, reduces waiting times
- Integral union design for ease of installation
- Available with metric or NPT threads
- Wide range of global certifications and approvals

**GUA junction boxes with union hubs**

**Application**
GUA junction boxes with union hubs are used in threaded rigid conduit systems in hazardous areas; to allow easy disassembly of conduit system; to function as junction and pull box for multiple conductors and conduits.

**Features & certifications**
- Supplied with union hubs providing a compact assembly
- Threaded covers
- Mounting straps standard on all boxes

**Certifications**
- Certifications: Class I, Division 1, Groups A, B, C, D; Class II, Groups E, F, G; Class III; NEMA 6P; UL/cULus Listed; IECEx/ATEX (Pending)
Industry-leading structure and support systems

Supported by a global engineering team and manufacturing facilities, Eaton’s market-leading B-Line series electrical and mechanical support systems are suited for various environments and conditions within the oil and gas market. The B-Line series cable tray, safety gratings, and strut systems help improve efficiency during installation with maximum return on investment.

Electrical & mechanical support systems

Cable tray and accessories

Application
B-Line series cable tray offering provides a strong and flexible solution for cabling/wiring throughout the rig site. Innovative design features, such as I-Beam side rail construction, help reduce material costs, labor costs and accelerate project schedules.

Rig locations
Derrick/mast, VFD/generators, motor control/SCR house, doghouse/operator’s house, power/pump station, shale shaker, mud tank/pumps, drawworks and top drive, drilling floor.

Certifications
• UL, IEC, NEMA, CSA, ABS, DNV

Features
I-Beam profile
• Side rail maximizes strength to weight ratio
• Reduced hardware required on splicing saves installation costs

Application specific materials
• Aluminum, stainless steel and FA series fiberglass (electrically conductive GRP) offer increased corrosion resistance
• Hot dipped galvanized steel offers increased durability in harsh environments

Reduced support requirements
• Industry leading 75-100mm tangents increase system strength
• Requires fewer supports than recommended by NEMA VE-2

I-Beam side rail design can carry up to 2.3 times more load than C-channel
**Strut systems, fittings & accessories**

**Application**

Eaton’s B-Line series 4Dimension strut system and traditional strut provide support for pipe hangers, cable tray and more in land drilling applications. The 4Dimension strut system allows for up to 50% time and material savings on many applications.

**4Dimension strut system**

- Up to 50% reduction in installation time for trapeze applications
- Up to 50% reduction in material cost in many applications
- Helps save space and weight by fully utilizing multiple sides for ease and flexibility of installation
- Functional replacement for back to back strut system, with considerable cost, time and material savings
- Compatible with most traditional fittings and accessories
- Multi-side design reduces complexity of higher cost fittings required for many applications

**V-Spring™ telescoping light pole**

**Application**

The patent-pending V-Spring™ telescoping light pole increases safety and decreases labor costs associated with lighting installation and routine maintenance. Its innovative design allows for all work to safely take place on the platform or walkway, eliminating the need for portable ladders and fall protection equipment. Applications include:

- Luminaires installed on industrial walkways, platforms, stairways and conveyors where OSHA/HSE regulations require fall prevention equipment
- Hard to reach or dangerous areas where safety is a big concern
- Hazardous and harsh environments subject to corrosive agents, vibration and extreme temperatures

**Features**

- **Spring assist**: provides true controlled lowering; less force required to raise or lower luminaire – no strain on worker; eliminates the need for portable ladders and fall prevention equipment
- **Easy fixture orientation**: adjustable 360° pole rotation allows for effortless positioning of light
- **Simple vertical travel**: easily extend to any raised height – one product covers multiple mounting heights;
- **Simple operation**: innovative design eliminates consideration of surrounding obstructions; easily adjust fixture position from ground or walkway
- **Designed for harsh environments**: no lubricants or maintenance required; suitable for dusttight applications; optional harsh environment cover eliminates moisture and airborne contaminants
- **Fully assembled and wired**: factory assembled wired and sealed for maximum environmental protection

**Certifications**

- NEC/CEC: cULus Listed for Class I, Division 2 and Class II, Division 2 hazardous areas when used with Champ® series Luminaires; UL1598; CSA C22.2 No. 250.0-08
- Environmental ratings: Dusttight; NEMA 4; IP66
- Vibration: DNV No. 2.4: 2006; IEC 60068-2-6: 2007

**Heavy Duty GRIP STRUT™ safety grating**

**Application**

Eaton’s B-Line series Heavy Duty Grip Strut safety grating is tailor made for slip-resistant walkways in demanding environments where mud, ice, oil and other substances can create hazardous working conditions. Available in a wide variety of traction patterns and material types to meet your needs.

**Grip Strut pattern types**

<table>
<thead>
<tr>
<th>No teeth</th>
<th>Standard with teeth</th>
<th>Reduced opening</th>
</tr>
</thead>
<tbody>
<tr>
<td>The best labor saving alternative to bar grating</td>
<td>Safety, self cleaning and self draining all-in-one</td>
<td>Limits items from falling through openings for safety below</td>
</tr>
</tbody>
</table>
Explosionproof variable frequency drives

Delivering installation savings, energy conservation and improved performance

Until now, a VFD couldn’t be used inside a classified enclosure in Class I, Division 1 or 2 locations. The heat generated by the VFD inside the classified enclosure caused it to fail. To overcome this problem, VFDs had to be stationed in control rooms outside of the hazardous area, resulting in expensive and impractical installation costs.

ACE explosionproof variable frequency drives are the only explosionproof enclosure to safely and reliably house a VFD. This revolutionary product features a NEMA 7 enclosure with patent pending active cooling technology, allowing a traditional VFD to be housed inside the classified enclosure without the risk of overheating.

ACE VFDs are rated Class I, Divisions 1 and 2 for use in the most extreme hazardous environments, are designed to match the highest equipment requirements, and to be skid mountable for maximum portability.

### Model Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Nominal HP (KW)</th>
<th>Max. disconnecting rating (Amps)</th>
<th>Disconnect fuse type</th>
<th>Enclosure size</th>
<th>Input rating (Amps)</th>
<th>Max. output rating (Amps)</th>
<th>Power loss (Watts)</th>
<th>Temp. rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE20 1</td>
<td>1</td>
<td>30 J 1</td>
<td>1.6 2.1 63</td>
<td>T6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACE20 2</td>
<td>2</td>
<td>25 J 1</td>
<td>2.6 3.4 76</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACE20 3</td>
<td>3</td>
<td>30 J 1</td>
<td>3.9 5 93</td>
<td>T6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACE20 5</td>
<td>5</td>
<td>90 J 2</td>
<td>6.9 8 164</td>
<td>T6</td>
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<td></td>
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<tr>
<td>ACE20 7</td>
<td>7.5</td>
<td>30 J</td>
<td>9.5 11 594</td>
<td>T4A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACE20 10</td>
<td>10</td>
<td>60 J 2</td>
<td>12.5 14 618</td>
<td>T4A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACE20 15</td>
<td>15</td>
<td>90 J 2</td>
<td>19.9 22 726</td>
<td>T4A</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>ACE20 20</td>
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<td>60 J 2</td>
<td>24.8 27 794</td>
<td>T4A</td>
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</tr>
<tr>
<td>ACE20 25</td>
<td>25</td>
<td>90 J 2</td>
<td>31.2 34 841</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACE20 30</td>
<td>30</td>
<td>90 J 2</td>
<td>36.7 40 859</td>
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<tr>
<td>ACE20 40</td>
<td>40</td>
<td>100 J</td>
<td>47.7 52 1010</td>
<td>T4A</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>ACE20 50</td>
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<td>59.6 65 1117</td>
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<td></td>
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</tbody>
</table>

Above data is for a 480V drive. For 600V drive, please consult factory.

* De-rating may be required to account for specific environmental conditions (high ambient temperature, altitude, etc.). Consult factory for de-rating information.

** When not installed in a well ventilated environment, provisions must be made to account for heat generation to ensure proper operation of the device.

### Step 1 – Select VFD horsepower rating

### Step 2 – Add desired options

<table>
<thead>
<tr>
<th>Communication modules</th>
<th>Suffix</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP</td>
<td>Profibus</td>
<td></td>
</tr>
<tr>
<td>CD</td>
<td>DeviceNet</td>
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<tr>
<td>CC</td>
<td>CAN Open</td>
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<tr>
<td>CM</td>
<td>Modbus</td>
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</tr>
<tr>
<td>CE</td>
<td>Ethernet</td>
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<tr>
<td>WL</td>
<td>Wireless</td>
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</table>

<table>
<thead>
<tr>
<th>Options</th>
<th>Suffix</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>Profibus</td>
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</tr>
<tr>
<td>RR3</td>
<td>DeviceNet</td>
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<tr>
<td>PB23</td>
<td>CAN Open</td>
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</table>

### Communication module & options

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE20 50</td>
<td>CE</td>
<td>Allen-Bradley® VFD with 50 HP rating</td>
</tr>
<tr>
<td></td>
<td>PT</td>
<td>Potentiometer</td>
</tr>
<tr>
<td></td>
<td>FJ90</td>
<td>Ethernet communications</td>
</tr>
</tbody>
</table>

### Step 3 – Add current rating for Eaton’s Bussmann fuses

Note: Add 5 Amps to your requirements to account for cooling system blower and round up to the nearest increment of 5
Explosionproof variable frequency drives

**Application**
- For speed control of pumps, compressors, fans, conveyors, separators, mixers and other process equipment
- Designed to meet high reliability and safety requirements
- Skid mountable for portability

**Benefits**
- **Simple and cost-effective installations**
  ACE Explosionproof VFDs are installed ‘on-machine’ inside the hazardous areas, eliminating expensive, complicated installations
- **Reduce energy costs through improved process control**
  Fine speed and torque control optimizes system performance and reduces energy consumption
- **Reduce operation and maintenance costs**
  Reduce stress on electrical system; lower speed/load on bearing seals; reduce risk of system damage due to cavitation
- **Avoid downtime with real-time equipment and process data**
  Diagnostics help locate disturbances to the system and suggest remedies, allowing proactive maintenance decisions to be made

**Explosionproof variable frequency drives**

1. **Heavy duty blower** creates airflow through the enclosure, allowing VFD to operate in ambient temperatures up to 50°C.
2. **Variable frequency drive** in explosionproof enclosure allows installation in classified area.
3. **Wireless interface module.**
4. **Filters** allow airflow into and out of the unit, eliminating overheating. Pre-screen filters eliminate clogging of primary filters.
5. **Fused disconnect.**
6. **Internal and external grounding lugs.**
7. **Filter shroud** covering top filters maintains NEMA 4X rating.
8. **Stainless steel, captive, triple lead quick release spring-loaded bolts** install faster and provide clear indication that the cover bolts are fully retracted from the body.
9. **Stainless steel hinges** provide convenient, easy access to enclosure interior.
10. **Explosionproof window** allows for viewing of the VFD interface module LCD screen.
11. **Explosionproof pilot lights** provide run, stop and fault indication.
12. **Optional potentiometer, pushbuttons and selector switches.**
13. **Enclosure epoxy painted** for superior corrosion resistance.
Signaling, monitoring and communication systems for harsh and hazardous applications

Audible and visible signaling
Packaged in a non-corrosive glass-reinforced polyester housing, MEDC and FHF LED visual and audible signals contain some of the most advanced electrical technology available today and meet the most rigorous safety standards for the most demanding environments.

Hernis CCTV systems
Designed specifically for the oil and gas industry, the CCTV product portfolio includes camera stations for hazardous and safe areas, control systems, monitors, software, cables and accessories. Hernis systems are renowned for their high quality and unrivaled durability. Each system is configured specifically for each project.

Communication systems
Communication devices for use in hazardous areas have to be especially well adapted to the extreme operating conditions they will be exposed to. Our Ex-telephones have been and are resistant to large temperature differences, air humidity, sea water, dust and strong mechanical wear and tear.

HERNIS safe area or Ex PTZ camera station

**Application**
The Hernis 8x8 CCTV System is ideal for land-based drilling operations. The 8x8 is an analog system which provides the “real time” video demanded in drilling operations. The small physical size of the control system is suitable for spaces of limited size. Operator station options include monitor and keyboard (with joystick) and/or touch-screen PC with Hernis Masterview Software.

**Rig locations**
Derrick, rig floor, shaker, mud pumps.

**Certifications**
- EX certified for Zone 1 (gas) Group IIC and Zone 21 (dust)

**Features**
- Easy-install and maintenance-free
- Field serviceable with no exposed cabling
- Well balanced, compact unit
- Automatic day/night function
- IR sensitive
- Integrated Exe junction box and wiper
- Scratch-proof, tempered glass
- Auto-focus and auto-iris with manual override
- Multi-cable/fiber/CAT6 accommodated
Fire alarm ESD call points

Application
Manual fire and ESD alarm call points have been designed for use in hazardous locations and harsh environmental conditions. Suitable for use onshore or offshore, where reduced weight and a high level of corrosion resistance is required.

Features & certifications
- Extended temperature range: -25°C to +50°C
- Corrosion-resistant GRP
- Plastic break glass element available
- Retained stainless steel cover screws
- Optional lift flap
- Key operated test facility BG
- In-line and fitted end of line resistors
- Optional LED to indicate operation
- Certifications: Class I, Division 2, Groups A, B, C, D; Class I, Zone 1, AExd IIC T5/T6; Class II, Division 2, Groups F, G; Marine Listed; CSFM Listed; ULC Listed; UL Listed for USA and Canada; ATEX approved; NEMA 4x, 6; IP66; IP67

Pre-engineered alarm stations (PAS)

Application
Audio/visual Class I, Division 1 and Class I, Division 2 combination units may be assembled from a range of strobes and horns. Mounted on a sturdy, drilled, anodized aluminum back plate, the units are pre-wired with a single input that operates both the sounder and strobe via existing safety system inputs.

Features & certifications
- Temperature range: -55°C to +70°C
- Corrosion-free GRP strobe/sounder
- Strobe available as Xenon, filament, fluorescent or LED
- Up to 115 dBA output at one meter
- *Certifications: Class I, Division 2, Groups C, D; Zones 1, 2; Class I, Division 1; ATEX approved Ex II 2GD; IP66; IP67
- *Certifications may vary by model or configuration.

Audible and visual signaling

Application
XB15 Strobes and DB3 Horns are designed for use in potentially explosive atmospheres and harsh environmental conditions. The enclosures are designed for use where light weight combined with corrosion resistance is required.

Features & certifications*
- All GRP corrosion-free flamepaths
- Integral volume control
- 27 user selectable tones
- Up to 108 dBA output at 10 foot distance
- *Products are certified Class I, Division 1 and Class I, Division 2
- Lightweight, all GRP, explosionproof horns are intended for use in potentially explosive atmospheres and have been designed with high ingress protection to cope with the harsh environmental conditions found offshore and onshore.

Features & certifications*
- U.V. stable, glass-reinforced polyester housings
- Corrosion-free stainless steel screws and mounting bracket
- Polarization diode and four wire lead connections for fire alarm applications
- Units can be painted to customer specification
- *Certifications may vary by model or configuration.

Telephones and hoods

Application
FernTel weatherproof analog or VoIP telephone, suitable for use in indoor and outdoor applications.

Features & certifications*
- Impact-resistant and shockproof housing perfect for areas exposed to high humidity, sea water and dusty environments.
- *Certifications may vary by model or configuration.

EXResistTel hands-free, analog or VoIP explosionproof and weatherproof telephones are designed for use in harsh and hazardous areas.

Features & certifications*
- Completely programmable and features a 21-piece stainless steel keypad designed for use with gloves
- *Certifications may vary by model or configuration.

Type 404 weatherproof telephone booth/hood with sound absorption up to -25 dBA.

Features & certifications*
- Available in sheet or stainless steel with RAL coatings in yellow or red with custom colors available upon request.
- *Certifications may vary by model or configuration.
The combination of Eaton’s Crouse-Hinds’, MTL, Azonix and Wonderware West’s expertise in the oil and gas industry facilitates a unified approach to intrinsic safety, explosionproof techniques and provides customers with a unique, single source of supply.

- **Azonix**
  Supplying ruggedized computers and data acquisition systems
- **MTL**
  System infrastructure products and protection equipment
- **WonderWare West**
  Providing cost-effective, full featured software solutions

### Azonix

#### Overview
Azonix supplies ruggedized computers and data acquisition systems to the oil and gas industry. With over 10,000 systems sold ranging from human machine interface (HMI) displays, data acquisition systems, wireless communication and I/O devices for hazardous environments, Azonix has a strong technical understanding for the demands of outdoor and hazardous area environments.

At Azonix, it is not just about the product, but the overall cost of ownership experience. Manufactured in a world-class facility focusing on quality and on-time delivery and supported by a strong service center focused on customer satisfaction, Azonix products give the best return on investment and help your business grow.

#### Rig locations
All locations

#### Certifications
- Class I & II – individual certification varies by product

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<table>
<thead>
<tr>
<th>Rig locations</th>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>All locations</td>
<td>Class I &amp; II – individual certification varies by product</td>
</tr>
</tbody>
</table>

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**Azonix drilling unit**

**Barracuda 19” BOP workstation**

**ProPanel PRO4500Z1 workstation**

**Barracuda 15” workstation**

**ProPanel MP2030 15” workstation**

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**EATON’S CROUSE-HINDS**  Drilling solutions for land-based rigs

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MTL Instruments

Application
MTL is a world leader in the development and supply of system infrastructure products and protection equipment. Many of the world’s safety critical processes are monitored, controlled, visualized or protected by MTL products.

Data protection products

Intrinsically safe interfaces

Fieldbus power conditioners and wiring components

Alarm system

HMI and process display systems

Intrinsically safe ethernet for hazardous areas

Wonderware West

Application
For either one or thousands of remote terminal units (RTUs), Wonderware provides the most cost-effective, full featured, geographically distributed software solutions for the oil and gas industry. Applications include well surveillance, gas and liquid pipelines and utility monitoring. Wonderware oil and gas software solutions deliver the unique value you need to achieve operational excellence.

Features
• Integrated data and application platform
• Connectivity to virtually any automation system or automation process
• Reusable components and extensible solution structures
• Remote monitoring and control management capability from anywhere