Complete, compliant, cost-effective solutions
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.

<table>
<thead>
<tr>
<th></th>
<th>Products used: LED, fluorescent &amp; HID lighting, plugs &amp; receptacles, control &amp; apparatus, cable glands &amp; fittings, hazardous area communications, cable management &amp; safety grating</th>
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</thead>
<tbody>
<tr>
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<td>Derrick/Mast</td>
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<td>Motor Control/SCR House</td>
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<td>Doghouse/Operator’s House</td>
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<td>6</td>
<td>Power/Pump Station</td>
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<td>Shale Shaker</td>
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<td>8</td>
<td>Mud Tanks/Pumps</td>
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<td>9</td>
<td>Drawworks &amp; Top Drive</td>
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<td>Drilling Floor</td>
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<td>11</td>
<td>Perimeter</td>
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</tbody>
</table>

**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

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July 2013

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Champ® FMV Series Floodlights

**Application**
Champ® FMV Series Floodlights are designed to provide full-spectrum, crisp, white light.

Five versions of the Champ FMV LED are available, providing ideal solutions for a wide range of 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**
- High brightness LED arrays
- 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
- Wall and surface mounting options available
- Instant illumination and restrike

**Model**
- **FMV5L**: 100W-150W
- **FMV7L**: 150W-175W
- **FMV9L**: 175W-250W
- **FMV11L**: 250W-320W
- **FMV13L**: 320W-400W

**Equivalent HID Luminaire**
- **FMV5L**: 100W-150W
- **FMV7L**: 150W-175W
- **FMV9L**: 175W-250W
- **FMV11L**: 250W-320W
- **FMV13L**: 320W-400W

**Typical Energy Savings/Lifetime**
- Up to 65% reduction in energy costs and 60,000 hours of continuous operation!
Hazard•Gard® EVLL Series Explosionproof LED Luminaires

**Application**
Hazard•Gard® EVLL Series Class I, Division 1 LED Luminaires designed to replace existing HID luminaires in locations requiring continuous and consistent light levels in extreme ambient temperatures. Also used in areas requiring frequent on-off of lights and in corrosive, wet and dusty environments.

**Features and Certifications**
- Certifications: Class I, Division 1, Groups B, C, D; Class I, Zone 1, Groups IIb + H2, IIb, IIA; Class II, Groups E, F, G; Class III, Simultaneous Presence; UL Listed and CSA Certified; NEMA 4X; IP66; Marine and Wet Locations

Vaporgard™ LED Series 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**
- 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; DLC approved

Champ® VMV Series LED Luminaires

**Application**
Champ® VMV Series Luminaires are designed to provide full-spectrum, crisp, white light with custom Type I, III and V distribution. Five versions of the VMV Series are available, providing ideal solutions for a wide range of applications.

**Features and Certifications**
- Redundant drivers provide reliable operation in the harshest environments
- 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; Marine and Wet Location

LL48 Linear LED Luminaires

**Application**
The LL48 Linear LED Luminaire allows for the replacement of existing harsh and hazardous industrial fluorescent fixtures and provides an energy-efficient proven light source for use in applications where reliability is a critical factor.

**Features & Certifications**
- Withstands extreme vibration
- Wide operating temperature range -35°C to +55°C
- Certifications: Class I, Division 2, Groups A, B, C, D; UL Listed & CSA Certified; 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

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Pauluhn™ ZonePro (Performer) 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
- 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

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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 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

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Pauluhn™ RigPro (Quantum) Series 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

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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

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EATON CORPORATION    July 2013
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
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
- Certified for use with Type P cable
- 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 F, G; Class III; UL Listed and CSA Certified

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

Pauluhn™ NRL Connectors

Application
Pauluhn NRL Connectors are used to supply power to lighting systems on land-based drilling rigs where watertight ANSI NEMA type receptacles are required.

Features & Certifications
- Accepts standard ANSI NEMA type plugs
- Mating plugs with integral threaded ring maintain a watertight seal
- Available in seven different voltage configurations
- Captive threaded receptacle cap
- Receptacle cover fits "FS" style boxes
- Certifications: Type 3, Type 4
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

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

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.
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 Series 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
- Standard neoprene gasket standard in all sizes and provides NEMA 4X rating
- Stroke-sanded finish creates smooth finish for easy installation of pushbutton/pilot light operators
- 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 Series 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 Series 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 Series Armoured & Non-armoured Cable Glands

Application
ADE Series Glands are used to terminate armoured and non-armoured cable in hazardous locations.

Rig Locations
Need locations where featured product is used...

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-658/06X
- GOST-R POCC FR Bo2011
- NEPSI N° 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

Liquid and putty style barrier seals available for glands requiring a barrier compound.

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

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

Full range of adapters, reducers, plugs, drains and other accessories available.

### Terminatortm II TMCX Series 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
- Certifications: Class I, Division 1, Groups A, B, C, D; Class II, Groups E, F, G; Class III; UL/cULus Listed; IECEx/ATEX (Pending)

### 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
- Wide variety of hub arrangements
- Mounting straps standard on all boxes
- Certifications: Class I, Divisions 1 & 2, Groups C, D; Class II, Division 1, Groups E, F, G; Class II, Division 2, Groups F, G; Class III; UL Listed and CSA Certified
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.

The ACE Series Explosionproof Variable Frequency Drive is 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 Series 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.

### Step 1 – Select VFD Horsepower Rating

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<td>34</td>
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<td>3</td>
<td>58.6</td>
<td>65</td>
<td>1117</td>
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</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 2 – Add Desired Options

**Communication Modules**

<table>
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<tr>
<th>Suffix</th>
<th>Description</th>
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<tbody>
<tr>
<td>CP</td>
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<td>CD</td>
<td>DeviceNet</td>
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**Options**

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<td>RR3</td>
<td>DeviceNet</td>
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<tr>
<td>PB23</td>
<td>CAN Open</td>
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</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

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EATON CORPORATION July 2013
**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

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.
Hazardous area communications

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

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
- Polarization diode and four wire lead connections for fire alarm applications
- Units can be painted to customer specification
- *Certifications: Class I, Division 1 and Class I, Division 2

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

EXResisTel 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

### Barracuda 15” workstation

- **Azonix drilling unit**
- **Barracuda 19” BOP workstation**
- **ProPanel MP2030 15” workstation**
- **ProPanel POR4500Z1 workstation**
- **Barracuda 15” workstation**
**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
Industry-leading structure and support systems

As the leading supplier of electrical and mechanical cable support systems, pipe supports and walkways, our designs are suited to match varying environments and conditions. Eaton’s B-Line has one of the broadest offerings of cable trays available in the market today.

Electrical & mechanical support systems

Cable Tray and Accessories

Application
B-Line’s 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
Heavy Duty GRIP STRUT™

Application
Heavy Duty GRIP STRUT™ 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

- **No Teeth**
  - Heavy Duty Grip Strut Pattern
  - The best labor saving alternative to bar grating

- **Standard with Teeth**
  - Heavy Duty Grip Strut Pattern
  - Safety, self cleaning and self draining all-in-one

- **Reduced Opening**
  - Heavy Duty Grip Strut Pattern
  - Limits items from falling through openings for safety below

Strut Systems, Fittings & Accessories

Application
As one of the largest manufacturers of bolted framing and strut support systems, we provide an economical solution for virtually any electrical, mechanical and industrial support application. Strut supports can be taken apart for reuse as quickly as they were assembled, producing substantial savings in time and labor.

Strut support system
- One of the broadest strut system offerings in the industry
- Solutions for virtually any electrical, mechanical or industrial support application

Multiple options
- Materials and finishes for harsh environments, including stainless steel, galvanized steel, aluminum and fiberglass

Pipe hangers
- All products meet or exceed industry standards set for their design and application