

INDUSTRY BROCHURE

Installation Products

Renewable energy industry



Installation Products Division

- Wire and cable management
- Cable protection systems
- Boxes and fittings
- Connectivity and grounding
- Medium voltage

Thomas & Betts is now part of ABB's Installation Products Division, but our long legacy of quality products and innovation remains the same. From connectors that support wire buildings on Earth to cable ties that help put machines in space, we continue to work every day to make, market, design and sell products that provide a smarter, safer and more reliable flow of electricity, from source to socket.

Table of contents

004–005	Designed to perform
006–009	Product selection guide
010–011	Challenge and commitment
012–013	Safety
014–015	Continuous operation and sustainability
016–017	Grounding & bonding
018–019	Power quality, efficiency and reliability
020–021	Corrosive & harsh environment protection
022–023	Extreme temperature protection
024–025	Space savings
026–027	Services and training
028	Installation Products for applications
029	Installation Products for industries

Designed to perform

Renewable energy industry

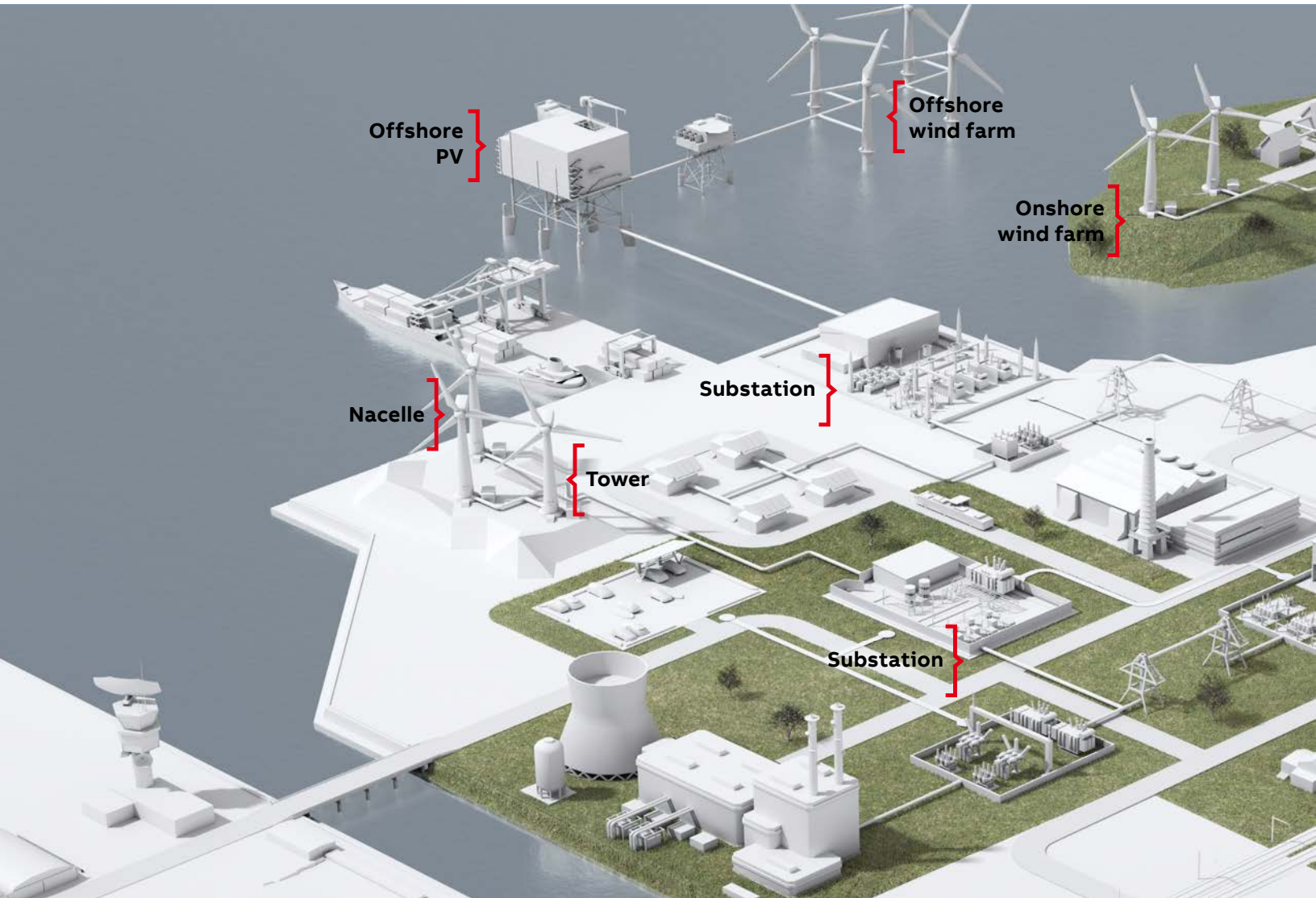
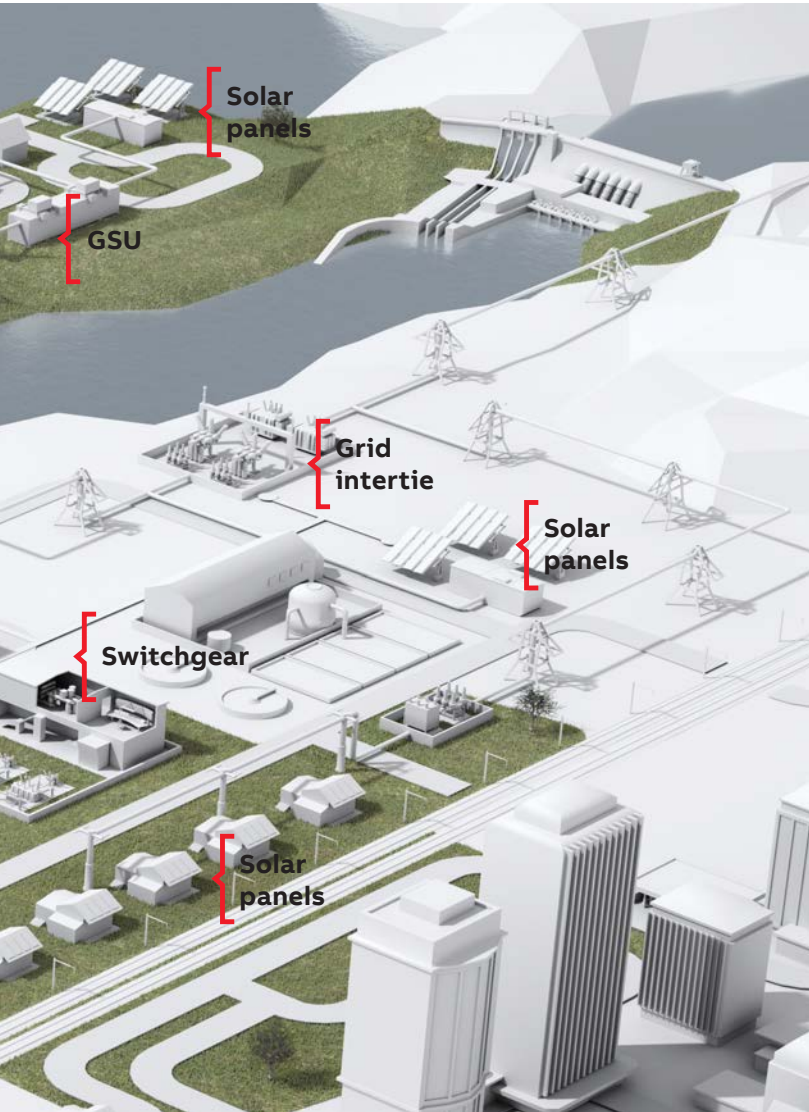


ABB understands the challenges faced in the renewable energy industry and is committed to providing innovative electrical solutions that not only reduce overall project costs, but also increase safety, promote sustainability and even improve cash flow.



Installation Products

for the renewable energy industry:



Safety



Total project cost reduction



Continuous operation & sustainability



Grounding & bonding



Power quality, efficiency & reliability



Corrosive & harsh environment protection



Extreme temperature protection



Space savings



Services & training

Whether it's labor-saving rough-in components, custom-designed electrical prefabrication systems, online cloud-based design tools or even our world-class logistics, ABB can help bring renewable energy projects in on time, within budget and profitably.

Product selection guide

for the renewable energy industry



Product selection guide

Product description	Safety	Total project cost reduction	Continuous operation & sustainability
Blackburn®			
E-Z-Ground® compression, mechanical and exothermic grounding systems	•	–	•
Compression lugs and splices	•	•	•
KUBE® power connectors and motor lead disconnects	–	–	•
Narrow-tongue lugs	–	–	–
Ergonomic compression tools	•	•	•
Color-Keyed® system training	–	–	–
Elastimold®			
Fused loadbreak elbows	•	–	–
Separable connectors	•	•	–
Solid-dielectric switchgear, switchgear automation packages, molded vacuum interrupters and arresters	•	•	–
Field training on cable accessories and switchgear	–	–	–
EZCODE®			
Danger/warning labels and signs, industrial/wire markers, barricade/burial tape	•	–	–
Fisher Pierce®			
Faulted current indicators and voltage and current sensors	–	–	–
Hi-Tech®			
Trans-Guard® fuses, molded current-limiting fuses, molded canister fuses	•	–	–
Field training on current-limiting fuses	–	–	–
Joslyn Hi-Voltage®			
Capacitor switches, reclosers, air disconnect switches and interrupter attachments	–	–	–
Power & high-voltage field maintenance services	–	–	–
Kindorf®			
Rooftop solar mounting systems, surface raceway, lighting support and cable mounting systems	–	•	–
316 stainless, aluminum, PVC-coated or non-metallic channel, hangers and clamps	•	•	•
Seismic bracing system	•	–	•
Kopex®			
High-temperature conduit systems	–	–	–
Kopex-Ex™			
Stainless steel flexible conduit systems for hazardous locations	–	–	–
Ocal®			
PVC-coated conduit systems	–	–	•
Ocal-Blue® type 4X form 8 conduit bodies	–	–	–
Installation certification training	–	–	–
Red-Dot®			
Code Keeper® weatherproof while-in-use covers	–	–	–

Continued on page 8.



Grounding & bonding	Power quality, efficiency & reliability	Corrosive & harsh environment protection	Extreme temperature protection	Space savings	Services & training
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Blackburn®

elastimold®

EZCODE®

FISHER PIERCE®

Hi-Tech®

JOSLYN®

Kindorf®

KOPEX®

KOPEX-Ex®

Ocal®

redodot®

Sta-Kon®

T&B® Fittings

Ty-Rap®

Product selection guide

for the wind power industry (continued)



Product selection guide

Product description	Safety	Total project cost reduction	Continuous operation & sustainability
Russellstoll®			
MaxGard® pin-and-sleeve connectors and explosion-proof interlocked receptacles	•	-	-
GSUL ground indicator system	•	-	-
Sta-Kon®			
Nylon-, vinyl- and non-insulated wire terminals	-	-	•
High-temperature wire joints and terminals	-	-	-
Corrosion-resistant, nickel-plated wire terminals	-	-	-
Heat-shrink terminals, ergonomic Comfort Crimp® tools and disconnect installation tool	-	•	•
Shrink-Kon® heat-shrink insulation for harnesses, wires or cables	-	-	•
Shrink-Kon® self-fusing insulation tape	-	-	-
Shield-Kon® coaxial grounding connectors and Dragon Tooth® insulation-piercing connectors	-	-	-
T&B® Cable Tray			
Aluminum, stainless steel and fiberglass support and wire management systems	-	-	•
T&B® Fittings			
Liquidtight conduit and fittings (Type A stainless steel/non-metallic,	-	-	•
ATX high-/low-temperature liquidtight conduit and fittings	-	-	-
Stainless steel form 8 and BlueKote® conduit bodies	-	•	-
Xtra Flex® non-metallic liquidtight conduit, tubing and Bullet® fittings	-	-	-
Ranger® series liquidtight cord connectors	-	•	-
Blackjack® grounding bushings	-	•	-
Wire-mesh strain-relief cord and conduit grips	-	-	•
Ty-Rap®			
Coated and uncoated stainless steel, extra-high temperature and flame-retardant UL94V-0 nylon cable ties	•	-	-
Ty-Rap Tote® cable tie dispensers and ergonomic installation tools	•	-	-
Low-profile nylon 6.6 cable ties	-	-	-
Services & training			
Onsite NEC® update training and onsite grounding & bonding training	-	-	-
T&B tool services, tool loaner and tool leasing programs	-	-	-



Grounding & bonding	Power quality, efficiency & reliability	Corrosive & harsh environment protection	Extreme temperature protection	Space savings	Services & training
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Blackburn®

elastimold®

EZCODE®

FISHER PIERCE®

Hi-Tech®

JOSLYN®

Kindorf®

KOPEX®

KOPEX-Ex®

Ocal®

redodot®

Sta-Kon®

T&B® Fittings

Ty-Rap®

Challenge and commitment

Green energy solutions are driving the new energy economy. The world's escalating demand for energy has driven heightened awareness of the need for clean, safe, renewable wind energy to supplement existing fossil and nuclear sources.

The most prominent renewable electricity sources are wind farms, which produce electricity from air in motion, and solar photovoltaic (PV) systems, which capture light energy from the sun's rays and convert it into electricity. Wind and solar power technologies are rapidly advancing and proliferating worldwide. The race is on to prove these sources are cost-effective and reliable, despite challenges that include:

- Distributed and often remote installations
- Harsh weather and extreme temperatures
- Growing rate of energy consumption
- Changing government and industry standards
- Rapidly advancing technology solutions
- Narrow confines and sustained vibration of wind towers

One differentiator of solar and wind power generation is its distributed and dynamic infrastructure. While conventional utility power facilities are very large, static fixtures, solar and wind farms are spread over several acres or miles of land and networked through a variety of intertie solutions to the grid. Because renewable energy generation is comparatively new, it is continually advancing as opportunities for technology efficiency, reliability and performance are discovered.

Solar photovoltaic and wind power generation plants require substantial up-front capital investment, heightening the need for government

incentives and external funding sources to get projects off the ground. The burden falls squarely on developers to prove that their systems will perform reliably, efficiently and safely, regardless of environmental conditions. This is accomplished by a variety of performance guarantees required by stakeholders.

For Tier 1 project funding, renewable power developers, venture capitalists and stakeholders are continuously turning to ABB for improved solutions. ABB makes products that support safe and continuous operation, minimize project labor costs and allow quick and easy protection of the wind or solar farm's power distribution systems. As a Tier 1 solar and wind power solutions company, we are committed to ensuring project success by:

- Participating in all aspects of design and critical engineering, from concept to installation
- Defining ISO certifications per stakeholder requirements
- Ensuring LEAN standards are established
- Meeting QA/QC design, order, inspect, install, test and operation criteria
- Conducting Factory Acceptance Testing (FAT)
- Ensuring prompt deliveries of equipment
- Establishing a "Rapid-Reaction Team" to quickly resolve project dilemmas
- Establishing closed-loop, validation-certified project processes from design to installation

Renewable energy applications



Generating electricity from renewable sources such as wind and solar is gaining momentum from the economics of grid parity as technology and demand become more sophisticated. Increasingly higher efficiencies and high-performance products will accelerate worldwide demand, making renewable wind power more cost-competitive with other conventional resources.



—
Have you implemented both active and passive safety systems to ensure that your renewable power infrastructure is safe and reliable?



Safety

As with any electrical system, the wind and solar power generation infrastructure must be equipped to ensure safe operation and avoid product contamination.

01 Hi-Tech®

- Trans-Guard® fuses, molded current-limiting fuses, molded canister fuses.

02 EZCODE®

- Danger/warning labels and signs, industrial/wire markers, barricade/burial tape.

03 Ty-Rap®

- Coated and uncoated stainless steel cable ties.
- Extra-high temperature and flame-retardant UL94V-0 nylon cable ties.
- Ty-Rap Tote® cable tie dispensers and ergonomic installation tools.

Elastimold®

- Fused loadbreak elbows.
- Separable connectors.
- Solid-dielectric switchgear, switchgear automation packages, molded vacuum interrupters and arresters.

Kindorf®

- 316 stainless, aluminum, PVC-coated or non-metallic channel, hangers and clamps.
- Seismic bracing system.

Russellstoll®

- MaxGard® pin-and-sleeve connectors and explosion-proof interlocked receptacles.
- GSUL ground indicator system.

*National Electrical Code and NEC are registered trademarks of the National Fire Protection Association, Inc.

The right products and controls provide the ability to:

- Avoid burns and electrical shock
- Protect against explosions and fire
- Prevent premature product wear
- Avert equipment failure
- Reduce costly downtime

Arc flash hazards are a prominent concern in renewable power generation systems. All electrical terminations, lugs, connectors and other devices must protect against electrical shock and arc flashes. Vapors and other agents with deteriorating effects on conductors or equipment should not be in close proximity. Contamination of this nature is time consuming and expensive to clean.

You'll find a thorough assortment of electrical system protection products from ABB, including solid-dielectric switchgear that uses no gas or oil, heat-shrink tubing to insulate exposed conductors and wiring and connectors with fault indicators.

Blackburn®

- E-Z-Ground® compression, mechanical and exothermic grounding systems
- Compression lugs and splices
- Ergonomic compression tools

Ty-Rap® – Cable ties

- UV resistant
- “The Grip of Steel®” non-magnetic stainless steel-locking device
- Versatile nylon 6.6 material
- With and without color and non-color UV-stabilizing additive
- Smooth notchless body reduces stress concentration points under tension

Hi-Tech® – Current-limiting fuses

- Greatly reduce energy let-through, minimizing the risk of catastrophic failures
- Interrupting capabilities up to 50,000A
- Used in molded fuses for underground junction boxes and switchgear for full-range load overcurrent protection
- Address arc flash concerns and generate no external arcing or byproducts

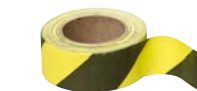
EZCODE® – Safety labels, tags, signs and barricade tapes

- Help to ensure personnel and workplace safety
- Conform to NEC® 2012 Section 110.3(A)(1)
- Highly visible and long-lasting materials
- Barricades and burial marking tapes in a variety of materials and colors
- Custom labels, tags and signs



Hi-Tech

01



EZCODE

02



Ty-Rap

03

Continuous operation and sustainability

Photovoltaic and wind outputs are naturally constrained by wind availability. Proper engineering and product support are critical in keeping the systems operating at peak performance.

01 T&B® Fittings

- Liquidtight conduit and fittings (Type A stainless steel/non-metallic, Type B non-metallic, Type C stainless steel/aluminum).
- Wire-mesh strain-relief cord and conduit grips.

Joslyn®

- Surge protection devices.

Kindorf®

- 316 stainless, aluminum, PVC-coated or non-metallic channel, hangers and clamps.
- Seismic bracing system.

Ocal®

- PVC-coated conduit systems.

T&B® Cable Tray

- Aluminum, stainless steel and fiberglass support and wire management systems.

In order to satisfy the requirements of the Power Purchase Agreements (PPA), renewable power facilities must avoid downtime by applying processes and technology that:

- Mitigate against meteorological forces
- Assist in accurate product selection
- Avoid inferior quality products
- Prevent poor installations

Due to the remote nature of wind and solar farms, outages can be particularly costly. Long response times to critical conditions or failures intensify the costs. Wind turbine heights add to that cost if the problem is within the tower column or in the nacelle.

Downtime prevention is the key. ABB has the quality products, training, services and support needed to prevent outages and ensure sustained, low-maintenance solar and wind power operation.

T&B® Fittings – Type A liquidtight flexible non-metallic conduit and fittings

- Non-metallic, steel and stainless steel fittings
- Ideal for continuous flexing or vibration applications
- Create a liquid-, dust- and oil-tight seal
- Suitable for operating temperatures from -20°C to 60°C

Blackburn®

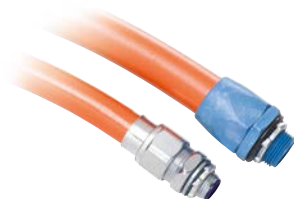
- E-Z-Ground® compression, mechanical and exothermic grounding systems
- Compression lugs and splices
- KUBE® power connectors and motor lead disconnects
- Ergonomic compression tools

Sta-Kon®

- Nylon-, vinyl- and non-insulated wire terminals
- Heat-shrink terminals, ergonomic Comfort Crimp® tools and disconnect installation tool
- Shrink-Kon® heat-shrink insulation for harnesses, wires or cables

T&B® Fittings

- Liquidtight conduit and fittings (Type A stainless steel/non-metallic, Type B non-metallic, Type C stainless steel/aluminum)
- Wire-mesh strain-relief cord and conduit grips



Products that are designed to perform consistently and are able to withstand the forces of nature require less field service.





Lightning produces currents of up to 200,000 amps within an extremely short period of time, testing the strength of the system's grounding capability. Are you prepared?

Grounding & bonding

Grounding and bonding are critical to any power generation facility, particularly wind turbines and solar farms, due to their exposure to lightning strikes.

-
- 01 Blackburn®**
- E-Z-Ground® compression, mechanical and exothermic grounding systems.
 - Compression Lugs and splices.
 - Ergonomic compression tools.

-
- 02 T&B® Fittings**
- Blackjack® grounding bushings.

Choosing the right product is necessary to:

- Ensure employee safety
- Prevent costly job interruptions
- Ensure timely completion of the installation and project
- Meet IEEE requirements with UL® and CSA application standards
- Provide electrical continuity and reliability

Power generation facilities must ensure that their grounding and bonding meet the specified code requirements. With the right electrical product selection, you can reduce the number of conductors and terminations required.

ABB provides an extensive range of products and sizes to fit all grounding and bonding needs, including compression, mechanical and exothermic products for above-ground and direct-burial grounding applications. We also deliver comprehensive, onsite grounding and bonding training in addition to services to ensure that your installation continues to operate smoothly and safely.

Blackburn®

- **E-Z-Ground® compression connectors**
 - High-conductivity copper and bronze connectors for direct-burial, OEM or telecomm applications
 - Featuring the Color-Keyed® Compression System that ensures proper connections
- **Mechanical grounding connectors**
 - High-strength split-bolt connectors for copper-to-copper connections
 - Service post connectors for steel structures, fence posts or transformers using one or two cables
 - ViceLock® connectors for cable tray, channel and strut applications
- **Exothermic grounding system**
 - Simple, self-contained system to form high-quality electrical connections

T&B® Fittings – Blackjack® grounding bushings

- Innovative design makes installation quicker and easier
- Design improves performance with superior continuity
- Design secures grip forms for lasting bond

Sta-Kon®

- Shield-Kon® coaxial grounding connectors and Dragon Tooth® insulation-piercing connectors



Power quality, efficiency & reliability

Reliability, efficiency and quality are primary goals of all energy generation utilities. Renewable power facilities depend on unique, advanced components that accommodate very specific tolerances and provide predictable, reliable performance and control.

01 Elastimold®

- Fused Loadbreak elbows.
- Solid-dielectric switchgear, switchgear automation packages, molded vacuum interrupters and current arresters.

02 Hi-Tech®

- Trans-Guard® fuses, molded current-limiting fuses, molded canister fuses.

03 Joslyn Hi-Voltage®

- Capacitor switches, reclosers, air disconnect switches and interrupter attachments.

These innovative electrical systems and tools are needed to:

- Adapt to fluctuating wind and solar supply
- Avoid damage from power quality disturbances
- Eliminate underperformance
- Minimize system losses and increase power output

ABB products are designed for energy efficiency and reliability. We offer monitoring and control solutions such as fault detection and overcurrent protection to enhance energy efficiency and system reliability. We use the right quality of raw materials to reduce voltage drops, increase usable power and boost the stakeholders' ROI.

Our adherence to ISO and industry standards ensures consistent quality and safety in our products. ABB incorporates the latest technological advancements to meet the changing needs of our customers.

Elastimold®

- **Molded vacuum interrupters**
 - Compact, lightweight, submersible protection
 - Predictable tripping for ease of coordination with upstream and/or downstream protection
- **Distribution switchgear**
 - Solid EPDM insulating media makes it maintenance free and environmentally friendly – no oil, no gas

- Compact and modular designs allow for smaller footprint and field assembly inside tight vaults

Joslyn® – Capacitor switches

- Vacuum interruption and solid-dielectric insulation translate into maintenance-free and environmentally friendly designs – no oil, no gas
- Exclusive Vacstat® vacuum interrupter monitoring
- Long-life operating mechanisms
- Available for applications in 15 to 230kV systems

Fisher Pierce® – Faulted current indicators

- Adaptive trip reset reduces inventory and eliminates the need to replace devices as the load changes
- Temporary fault detection option to help locate nuisance temporary faults
- Highly visible strobe, LED and fluorescent orange flag indication options – and SCADA ready

Hi-Tech® – Current-limiting fuses

- Greatly reduce energy let-through, minimizing the risk of catastrophic failures
- Interrupting capabilities up to 50,000A
- Address arc flash concerns and generate no external arcing or byproducts internal bonding strap for rigid conduit
- XJG conduit expansion coupling with internal bonding strap



Are you generating enough power to satisfy demand?
Are weaknesses in your systems reducing your energy output?



Unless properly mitigated, harsh environmental conditions can prove costly to renewable power generation facilities.



Corrosive & harsh environment protection

Solar and wind farms are, by their nature, continually exposed to the elements.

01 **Kindorf®**
 • Lighting, junction boxes and controls.

02 **Ocal®**
 • Explosion-proof raceway systems.

03 **T&B Fittings®**
 • Flameproof IECEx and ANZEx certified cable gland for steel wire armored cable.
 • Barrier IECEx and ANZEx certified cable gland for steel wire armored cable.

04 **Ty-Rap®**
 • Polypropylene ties engineered for harsh environments, especially for corrosion resistance.
 • Stainless steel ties for enhanced, not infinite, corrosion protection.

Kopex-Ex™
 • Stainless steel flexible conduit Systems for hazardous locations.

Red-Dot®
 • Code Keeper® weatherproof while-in-use covers.

Russellstoll®
 • MaxGard® pin-and-sleeve connectors and explosion-proof interlocked receptacles.

Sta-Kon®
 • Corrosion-resistant, nickel-plated wire terminals.
 • Shrink-Kon® heat-shrink insulation for harnesses, wires or cables.
 • Shrink-Kon® self-fusing insulation tape.

*National Electrical Code and NEC are registered trademarks of the National Fire Protection Association, Inc.

Environmental risks to renewable power generation infrastructure include:

- High moisture and high winds
- Lightning
- Salt spray, sand and dust
- Ice accumulations

Corrosion caused by these factors is among the greatest threats to safe and reliable operations. Uncontrolled dew point or moisture can cause corrosion and rust, and the pairing of dissimilar metals enhances the corrosive atmosphere. Extreme weather conditions should not compromise performance sustainability. With proper planning and selection, your electrical systems and devices will survive the elements. For example, you can reduce the occurrence of dissimilar metals to avoid corrosion, and protect exposed wiring and conductors by insulating with heat-shrink.

ABB offers these solutions and others to protect against challenging environments. Our extensive electrical product suite is designed, manufactured and tested to meet all NEMA, UL®, NEC®, IEEE and other specified code requirements.

Kindorf® – Stainless steel modular framing channel, pipe hangers, beam clamps and accessories

- Available in 316 stainless steel, aluminum, PVC-coated, non-metallic and standard Galv-Krom® finish

T&B® Fittings – BlueKote® conduit bodies

- Multi-layer protection with epoxy external finish for superior corrosion control
- Tapered NPT threads for integrated bushing
- BlueKote® internal finish for faster, easier wire pulling

Ty-Rap® – Cable ties

- Polypropylene ties engineered for harsh environments, especially for corrosion resistance
- Stainless steel ties for enhanced, not infinite, corrosion protection

Ocal® – PVC-coated conduit

- Industry leading thread protection through a hot-dipped galvanizing process, and industry leading UL® Listed Type 4X PVC-coated conduit bodies
- Meets the requirements of NEMA RN-1 without exception
- UL® Listed with both the zinc coating and the PVC coating investigated and listed per UL6
- UL® Listed including UV resistance testing
- PVC-Coated Conduit System provides superior corrosion protection against many harmful elements
- Interior blue urethane provides corrosion protection around copper wire or fiber optics

T&B® Fittings

- Stainless steel form 8 and BlueKote® conduit bodies
- Xtra Flex® non-metallic liquidtight conduit, tubing and Bullet® Fittings



01 **Kindorf®**



02 **Ocal®**



03 **T&B® Fittings**



04 **Ty-Rap®**

Extreme temperature protection

Wind and solar power generation facilities may be subject to extreme temperatures and temperature swings. Electrical systems in these environments must be robust enough to withstand the elements and ensure continuous delivery of quality power.

01 Sta-Kon®

- High-temperature wire joints and terminals.

02 T&B® Fittings

- ATX high-/low-temperature liquidtight conduit and fittings.

03 Ty-Rap®

- Coated and uncoated stainless steel cable tie.
- Extra-high temperature and flame-retardant UL94V-0 nylon cable ties.

Otherwise, the owner/operator will face degraded operational capacity and the risk of costly downtime. For example:

- Hotter temperatures reduce the power output of photovoltaic modules
- Prolonged heat causes materials to age more rapidly
- Frost heave occurs when materials contract and expand due to ground frost
- Hail can cause physical damage to the systems

To help manage renewable power electrical systems installed in freezing or high-heat climates, ABB offers a broad array of electrical products that can withstand or insulate against extreme temperatures. Durable materials, insulated products, resilient fasteners, heating and cooling elements and temperature controls are among the solutions available.

Ty-Rap® – Stainless steel cable ties

- Stainless steel alloys available for enhanced corrosion protection
- Quick, easy installation and secure locking

Kopex-Ex™

- Stainless steel flexible conduit systems for hazardous locations

T&B® Fittings – ATX liquidtight flexible metal conduit and fittings

- Construction utilizes the flexibility of a standard cable core
- Engineered with the advantage of a thermoplastic rubber jacket
- Virtually unaffected by temperature extremes
- Contain no halogens
- Flammability rating of UL94-HB
- 52® Series High-Temperature Liquidtight
- Fittings rated UL94V-2

Sta-Kon® – High-temperature wire terminals

- Tefzel® insulated terminations for high temperatures
- Braided and overlapped seams eliminate chances for lost wire strands, poor resistance, wire pullout and electrical failure
- Selective annealing to strengthen materials and reduce fatigue
- Anti-rotational tongue prevents shorting by keeping terminal secure within the block

Kopex®

- High-temperature conduit systems

*Tefzel is a registered trademark of the DuPont Corporation.



01 **Sta-Kon®**

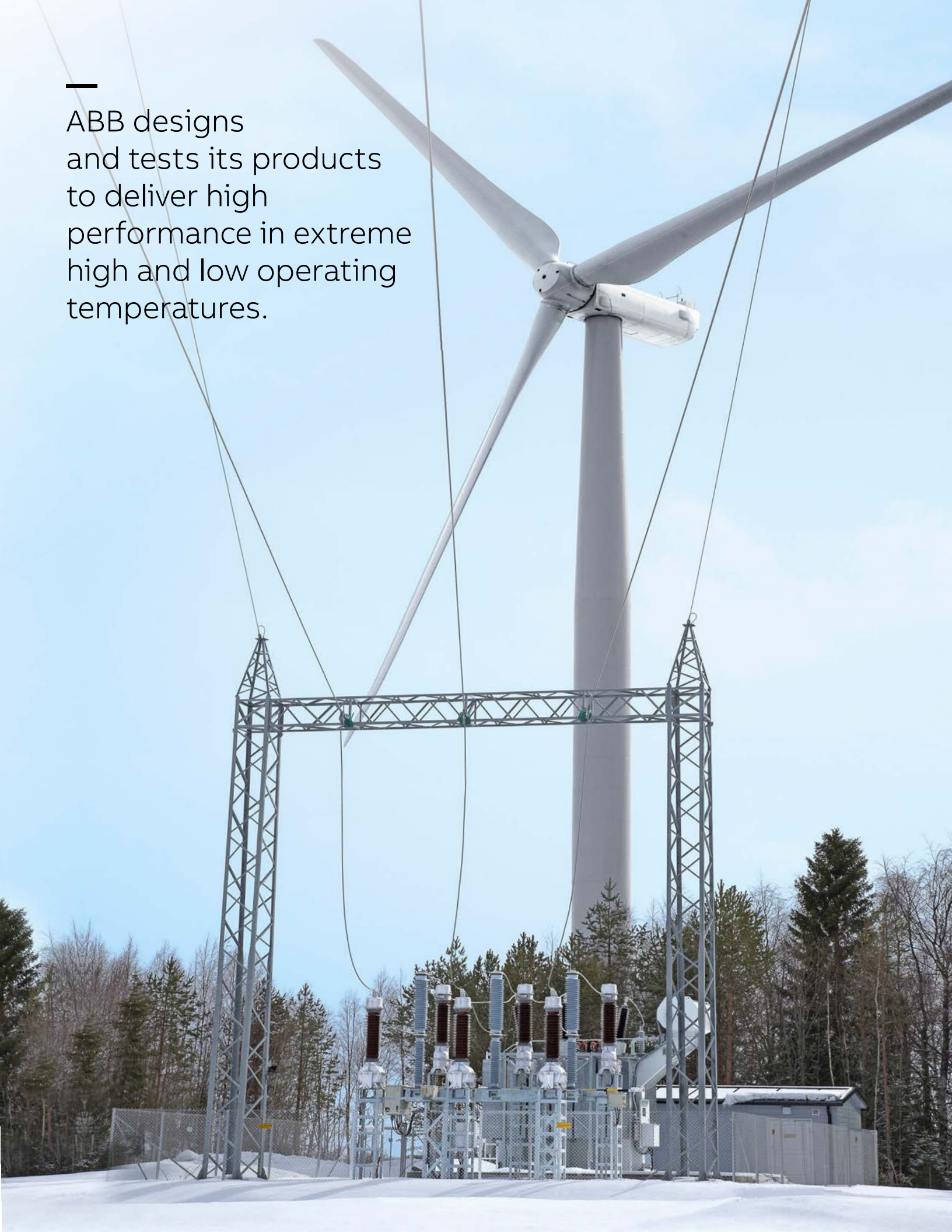


02 **T&B® Fittings**



03 **Ty-Rap®**

ABB designs and tests its products to deliver high performance in extreme high and low operating temperatures.





Space savings

Adapting electrical devices and systems to fit in small or confined spaces requires innovative technology.

01 Elastimold®

- Separable connectors.
- Molded vacuum interrupters.

02 Blackburn®

- Narrow-tongue lugs.

ABB delivers space-saving solutions designed to:

- Pack more power into a smaller footprint
- Ensure sufficient operating clearance
- Allow retrofits without altering the surrounding infrastructure
- Accommodate load growth within the existing available space
- Reduce construction and maintenance costs
- Provide engineering and 3D CAD for equipment placement

Tall, narrow wind towers present unique challenges. Smaller footprint products are needed to fit the smaller space without sacrificing efficiency, reliability or safety. Wind power utilities need electrical products that can handle the same current ratio in smaller packages, such as narrow lugs that handle the same current as a conventional lug. Switchgear, fusing and surge arresters for wind applications also need to be engineered for confined spaces.

Solar power utilities may also be subject to space constraints. In these circumstances, the racks, inverters, switchgear and other technologies that make up the solar power electrical system need to be designed to fit.

Elastimold® – Molded vacuum interrupters

- Compact, lightweight submersible overcurrent protection
- TCC curves provide predictable tripping for ease of coordination with upstream and/or downstream protection



01

 **elastimold**



- Enable radial feeders or loops to be reconfigured, either manually or via SCADA

Ty-Rap®

- Low-profile nylon 6.6 cable ties

Blackburn® – Narrow-tongue lugs

- Engineered for 90°, up to 35kV
- Designed for quick, positive compression
- Low compression areas ensure complete contact
- Filled with high-temperature oxide inhibitor compound
- Only seven dies handle all 14 lug sizes
- 1½" wide tongues save vertical space on tie bar
- Can be directly substituted for equipment mechanical lugs in most applications
- Featuring the Color-Keyed® Compression System that ensures proper connections



02

Blackburn®

Services & training

The renewable energy industry is extremely dynamic, making it difficult to develop in-house expertise.

—
NEC and National Electrical Code are registered trademarks of the National Fire Protection Association, Inc.

Our services

Wind and photovoltaic developers must reconcile these key challenges:

- New and emerging technologies
- Evolving regulations and standards
- Workforce skills gap

Wind and solar electrical infrastructure continues to evolve as designers and engineers improve existing technologies and increase reliability, efficiency and safety. Specialized training is often required.

Blackburn®

- The QTP program provides a guaranteed two-week shipment of Blackburn® products
- Configurator enables special connectors to be designed with a guaranteed two-week shipment
- Product specification specialists and Mobile Technical Specialists are available nationwide to train in the proper use and installation of Blackburn® products
- Inside Tech Support group provides 24/7/365 expertise for Blackburn® products

Hi-Tech®

- Field training on current-limiting fuses

Joslyn Hi-Voltage®/Elastimold®

- Power & High Voltage Field Service group provides field maintenance for Joslyn Hi-Voltage® and Elastimold® equipment

Ocal®

- Onsite installation training provides a review and hands-on practice of clamping, cutting, threading, assembling and repairing the Ocal® PVC-coated conduit system
- Training also extends warranty from two to five years on a system installed by a certified contractor

Additional services & training

- NEC® Update Training provides an overview of the latest changes to the National Electrical Code®
- Grounding & Bonding Training covers design, layout and connections
- T&B Tool Services, tool loaner and tool leasing programs

How will you keep up with
the rapid pace of innovation in
wind power electrical systems?



Installation Products for applications

- 01 Continuous operation and sustainability.
- 02 Corrosion and harsh environment protection.
- 03 Safety and contamination.
- 04 Emergency electrical solutions.
- 05 Total project cost reduction.
- 06 Liquid ingress protection.
- 07 Extreme temperature protection.
- 08 Grounding and bonding.
- 09 SKU Reduction.

ABB

APPLICATION BROCHURE
Installation Products
Continuous operation and sustainability



Installation Products Division

- Wire and cable management
- Cable protection systems
- Buses and fittings
- Connectivity and grounding
- Medium voltage

01

ABB

APPLICATION BROCHURE
Installation Products
Corrosion and harsh environment protection



Installation Products Division

- Wire and cable management
- Cable protection systems
- Buses and fittings
- Connectivity and grounding
- Medium voltage

02

ABB

APPLICATION BROCHURE
Installation Products
Safety and contamination



Installation Products Division

- Wire and cable management
- Cable protection systems
- Buses and fittings
- Connectivity and grounding
- Medium voltage

03

ABB

APPLICATION BROCHURE
Installation Products
Emergency electrical solutions



Installation Products Division

- Easy-clearing cable and cable protection for walk-down areas
- Supporting and diverting power to temporary structures
- Cable bundling/strapping and identification components
- Temporary power systems

04

ABB

APPLICATION BROCHURE
Installation Products
Total project cost reduction



Installation Products Division

- Wire and cable management
- Cable protection systems
- Buses and fittings
- Connectivity and grounding
- Medium voltage

05

ABB

APPLICATION BROCHURE
Installation Products
Liquid ingress protection



Installation Products Division

- Wire and cable management
- Cable protection systems
- Buses and fittings
- Connectivity and grounding
- Medium voltage

06

ABB

APPLICATION BROCHURE
Installation Products
Extreme temperature protection



Installation Products Division

- Wire and cable management
- Cable protection systems
- Buses and fittings
- Connectivity and grounding
- Medium voltage

07

ABB

APPLICATION BROCHURE
Installation Products
Grounding and bonding



Installation Products Division

- Wire and cable management
- Cable protection systems
- Buses and fittings
- Connectivity and grounding
- Medium voltage

08

ABB

APPLICATION BROCHURE
Installation Products
SKU Reduction



Installation Products Division

- Wire and cable management
- Cable protection systems
- Buses and fittings
- Connectivity and grounding
- Medium voltage

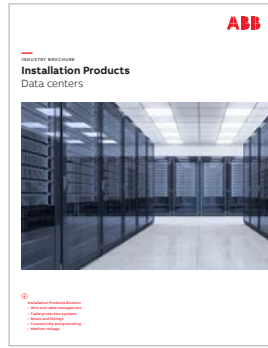
09

Installation Products for industries

- 01 Commercial and institutional buildings.
- 02 Data centers.
- 03 Food and beverage industry.
- 04 Food and beverage industry - plant assessment.
- 05 Utility industry.
- 06 Power generation industry.
- 07 Chemical industry.
- 08 Oil and gas industry.
- 09 Wind power industry.
- 10 Renewable energy industry.
- 11 Water and wastewater treatment industry.
- 12 Single and multi-family housing industry.
- 13 Rail industry.
- 14 Civil infrastructure industry.
- 15 Metals and mining industry.



01



02



03



04



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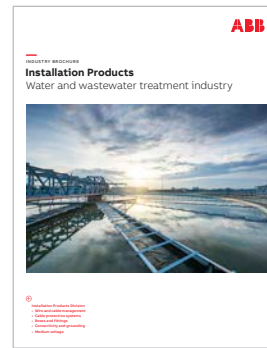
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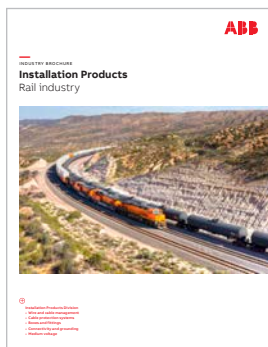
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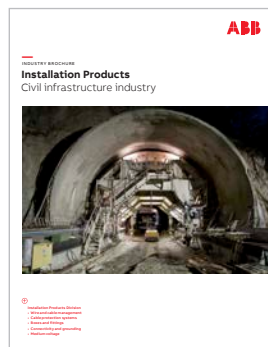
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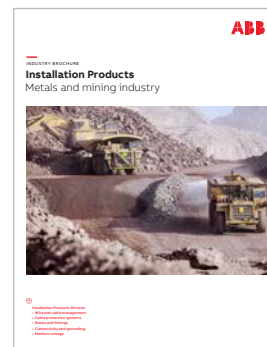
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ABB is proud to be helping companies all over the world create electricity from renewable, and sustainable sources, and doing so without compromising on safety or manageability. ABB systems are protecting, and managing, numerous alternative energy power stations, keeping the electricity flowing from any, and every, available source.







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US

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