Safety with PowerFlex 7000 Medium Voltage AC Drives

Help Protect Your Personnel and Equipment
Meeting a High Standard of Safety

Users across a broad range of industries are demanding greater safety levels in their facilities – to better protect their personnel and assets. Global standards are changing to reflect these evolving requirements. Rockwell Automation takes a holistic approach to safety, providing innovative safety solutions to improve the functional operation of your machinery while helping to increase safety, efficiency and productivity. As the world leader in industrial automation and safety and as a technology innovator, see how our Medium Voltage safety solutions can help increase your productivity and personnel safety.

Help Reduce Risk Throughout your Operations

Around the world, Allen-Bradley® PowerFlex® 7000 AC drives have built a reputation for providing efficient and reliable motor control for heavy industry’s most demanding applications.

New approaches and technologies increase protection of personnel and equipment, minimizing the risk of workplace dangers.

PowerFlex 7000 drives offer drive configurations and control options such as Active Front End (AFE) with Direct-to-Drive™ technology and high performance torque control for applications with higher performance requirements. Add to this, the Safe Torque Off control option, and the ArcShield™ arc-resistant enclosure option, and the PowerFlex 7000 drive can provide a complete solution that delivers higher performance and enhanced safety for your critical assets.

Our innovative medium voltage drives help improve the functional operation of your machinery while helping to increase personnel safety, efficiency and productivity.
Help Increase Functional Safety with Safe Torque Off

Functional safety engineering practices develop reliable safety measures to meet strict international safety standards. These practices can help increase the safety of users and reduce system complexity by incorporating safety features directly into the design of machinery.

**PowerFlex 7000 Medium Voltage Drives with Safe Torque Off can Help You Simplify Your Functional Safety Design**

Safe Torque Off technology allows you to remove power from the motor without removing power to the drive, enabling a faster restart of the system after a safe state is reached.

Safe Torque Off is designed into the drive control and does not require additional electromechanical components, helping to remove wiring needs, and lower your hardware inventory and installation costs.

Ideal for industrial applications, such as material-handling conveyors and grinding mills, the PowerFlex 7000 drive with Safe Torque Off is TÜV-certified. It is also certified to Safety Integrity Level (SIL) 3 of IEC 61508, and Performance Level e (PLe), Category 3 of ISO 13849-1, the highest levels achievable for drives.

- Prevents a drive from delivering rotational energy to motors
- Helps reduce wear from repetitive restarts
- Achieves requirements for SIL 3 per IEC 61508 and PLe, Category 3 per ISO 13849-1
- TÜV Certified
PowerFlex 7000 Drive System with ArcShield

Advances in Medium Voltage Drive Technology Help Reduce Arc Flash Hazards and Minimize Risks

To help reduce the risks that are associated with the operation and maintenance of electrical equipment, and to meet customers’ needs, Rockwell Automation introduced its first arc resistant medium voltage drive system. Based on over a decade of successful design and implementation of arc resistant medium voltage and low voltage motor controllers, the PowerFlex 7000 drive system with ArcShield technology is designed to help protect employees and minimize unplanned outages and downtime.

ArcShield, an arc resistant design trademarked and designed by Rockwell Automation, combines an arc resistant enclosure with our intelligent control systems, offering improved safety features along with remote operation and monitoring capabilities.

Meeting Safety Standards with an Effective Design

The PowerFlex 7000 drive system with ArcShield is a fully integrated Allen-Bradley® CENTERLINE® starter and PowerFlex 7000 drive combination. Standalone, fully integrated systems and systems that are designed to work with existing Allen-Bradley medium voltage starter lineups are available – providing either a 40 kA or 50 kA arc fault rating.

Designed to redirect the energy that is created from an arc flash event, out the top of the enclosure and away from personnel, Type 2B accessibility helps protect personnel while in front, at the side, or in the rear of the enclosure in the event of an arcing fault. Additionally, Type 2B protection is maintained when the low voltage control door is open for maintenance purposes.

An arc flash can cause injury to anyone nearby and destruction of equipment with temperatures exceeding 35,000 °F / 19,500 °C at arc terminals.

One rapidly growing area of focus in a broad safety enhancement program is reducing the potentially serious hazards that are associated with arc-flash events.
Fully integrated 50 kA rated PowerFlex 7000 Drive System with ArcShield Technology

**Designed to Create a Safer Working Environment with Added Protection for Arc Flash Events**

The PowerFlex 7000 drive systems with ArcShield enclosures have been strengthened to contain the pressure that is created from an arc flash event. It is reinforced with additional support members, plates and uses 12-gauge steel for all doors, sides, roof and back sheets. Extra strength, multi-point latches and robust door hinges add to the security of the enclosure’s main doors.

To redirect the arc exhaust gases, a special pressure relief vent on the enclosure’s roof opens to release the pressure. Various overhead plenum exhaust system configurations channel the superheated gas and vaporized copper and steel, to a safe and controlled location.
Simple and Secure Remote Monitoring for Your Critical Assets

Remote monitoring allows control and monitoring of the drive away from the application, designed to reduce personnel exposure to operating equipment and potential hazards.

PowerFlex 7000 drives provide practical features that help keep your personnel away from potential electrical hazards. You can effectively control and monitor the operating conditions of the PowerFlex 7000 drive through EtherNet/IP communications, by integration into your control system architecture or by using a remote PanelView™ HMI. With remote connectivity to the drive, you can help minimize the need for personnel to enter electrical rooms.

When a PowerFlex 7000 drive is coupled with an Allen-Bradley Logix programmable automation controller, you can streamline your integration with Studio 5000 Logix Designer®, while extending your control and operation to your control room and monitor all of your operations from one location.

The PowerFlex 7000 drive features a user-friendly PanelView™ graphic terminal with touch screen and built-in PDF viewer along with a consolidated control interface. The HMI can be mounted remotely, offering another alternative to helping keep personnel away from electrical hazards.

Long Motor Cable Lengths

PowerFlex 7000 drives allow for long motor cable distance. This can enhance operator safety in situations where operator risks are associated with the environment in which the motor is placed. Unlike most competing medium voltage drive technologies, the PowerFlex 7000 drive doesn’t have motor cable length limitations due to high switching frequencies, high dv/dt characteristics of the switching device, or capacitive coupling.

PowerFlex 7000 drives are capable of controlling motors as far away as 15 km (9.3 mi) from the drive without a filter. This is ideal for land-based or offshore platform-based electro-submersible pumps applications, or any application requiring centrally located electrical control houses and discrete motor locations due to environment.
Protect Your Investment

By leveraging our global infrastructure of support centers and subject matter experts, we’re here to help you protect your automation investment. Beyond providing you peace of mind, as we help you keep your plant running, we’ll assess your entire operation and recommend the right mix of services to help maximize productivity, optimize plant assets and improve your overall financial performance.

Safety assessments help you comply with current and emerging standards by providing consulting services for safety critical controls. Once a safety assessment is complete, you are provided with complete documentation and remediation suggestions.

Safety Assessment Services Include:

- Risk Assessments
- Arc Flash Analysis
- Safety Risk Assessments
- Hazard Assessments

Training

In addition to services, Rockwell Automation also provides training courses on electrical safety, National Fire Protection Association (NFPA) 70E and arc flash compliance. These programs are meant to help increase employee awareness of electric shock, ARC flash and ARC blast hazards, along with bringing your training program into compliance with OSHA and NFPA 70E 2015 mandated electrical training.

Rockwell Automation provides several courses including the following major topics:

- NFPA 70E 2015® Electrical Safety Requirements
- Safe Electrical Practices
- Calculating Flash Protection Boundary
- Personnel Protective Equipment

Learn more about Rockwell Automation training courses from a local authorized Allen-Bradley Distributor or Sales/Support office.

Find a full list of courses at http://www.rockwellautomation.com/training

Virtual Support Engineer™

Gaining insight into the performance of your automation machinery is the key to optimizing your operations and preventing costly downtime events.

The Virtual Support Engineer is a service that offers a simple and secure approach to monitoring your equipment and collecting valuable performance analytics. Now, you can better understand how well your machinery is working and be alerted when performance falls outside of your predefined perimeters.

To monitor PowerFlex 7000 medium voltage drives, we deploy the Virtual Support Engineer gateway device inside the drive. The Virtual Support Engineer continuously monitors the drive’s critical variables and notifies Rockwell Automation of any events that could impact the drive’s performance.

Using the Virtual Support Engineer, you have access to a wealth of valuable data and analytics for your machinery. Virtual Support Engineer sends all the data to the cloud to view archiving, performance analytics and historical data/trending.

Virtual Support Engineer can be configured to monitor any number of parameters in the drive including:

- Speed
- Current
- Voltage
- Power
- Drive Warning Queue
- Drive Fault Queue
- Drive Status
Rockwell Automation Services & Support

Global Support. Local Address. Peace of Mind.

Providing the resources you need, when and where you need them, Rockwell Automation has an integrated, global network of ISO-certified repair centers, exchange hubs, field service professionals, IACET-recognized training centers, certified technical phone support centers and online tools.

www.rockwellautomation.com/go/services

Meet Your Everyday Technical Needs

<table>
<thead>
<tr>
<th>Remote Support &amp; Monitoring</th>
<th>Training Services</th>
<th>OnSite Services</th>
<th>Repair Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Real-time product, system and application-level support</td>
<td>• Instructor-led and computer or web-based courses</td>
<td>• Embedded engineering</td>
<td>• Product remanufacturing</td>
</tr>
<tr>
<td>• Unlimited online resources and tools</td>
<td>• Virtual classroom</td>
<td>• Preventive maintenance</td>
<td>• Repair services on a full range of industrial automation brands and products</td>
</tr>
<tr>
<td>• Live chat and support forums</td>
<td>• Training assessments</td>
<td>• Migrations and conversions</td>
<td>• Annual repair agreements</td>
</tr>
<tr>
<td>• Secure equipment monitoring, alarming and diagnostics</td>
<td>• Workstations and job aids</td>
<td>• Start-up and commissioning</td>
<td></td>
</tr>
</tbody>
</table>

Maximize Your Automation Investment

<table>
<thead>
<tr>
<th>MRO Demand Management</th>
<th>Lifecycle Extension &amp; Migrations</th>
<th>Network &amp; Security Services</th>
<th>Safety Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Comprehensive asset management planning</td>
<td>• Installed Base Evaluation™</td>
<td>• Control system lifecycle services</td>
<td>• Safety assessments and remediation</td>
</tr>
<tr>
<td>• Reliability services</td>
<td>• Pinpoint obsolescence risk</td>
<td>• Manage network convergence</td>
<td>• Safety design, integration and validation services</td>
</tr>
<tr>
<td>• Warranty tracking</td>
<td>• Tools and lifecycle support service agreements to mitigate production risk</td>
<td>• Security technology, policies and procedures services</td>
<td></td>
</tr>
<tr>
<td>• Quick access to global spare parts inventory</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Visit the Rockwell Automation Support Center at www.rockwellautomation.com/knowledgebase for technical information and assistance, plus:

• View technical/application notes
• Obtain software patches

Visit Get Support Now at www.rockwellautomation.com/go/support to select your country and find your local support information.

Connect with us.

www.rockwellautomation.com

Allen-Bradley, ArcShield, CENTERLINE, Direct-to-Drive, Listen. Think. Solve., PanelView, PowerFlex, Rockwell Automation, Rockwell Software, Studio 5000 Logix Designer and Virtual Support Engineer are trademarks of Rockwell Automation, Inc. Trademarks not belonging to Rockwell Automation are property of their respective companies.

www.rockwellautomation.com