



Meeting Today's Demands for a Safer
Tomorrow

Technologies for Nuclear Applications

Proven automation solutions and local expertise to help you overcome your toughest challenges.





Our nuclear-qualified product offering includes solenoid valves, proximity sensors and more—all from one supplier.

Ensure safe, reliable plant operation with valves, switches and sensors that are built to last

The nuclear industry demands the toughest components. Solenoid valves, pressure and temperature switches, actuators and proximity sensors must be able to operate on demand no matter what—whether a loss of coolant accident (LOCA), high-energy line break (HELB) or main steam line break (MSLB). A trusted name in nuclear, Emerson combines over 55 years of industry experience with an extensive nuclear-qualified product offering—helping you optimize your processes and ensuring your equipment operates with safety and reliability. From switch boxes to pilot valves, our components promise long service life in the world's harshest environments.

Due to the industry's rigorous qualifications and testing processes, outfitting aging nuclear plants with new or updated technologies is a challenge.



Plant owners are increasingly looking to solutions that reduce their maintenance needs—sparing personnel from having to enter dangerous containment areas.



Nowhere is quality and reliability more valued than in the nuclear industry—necessitating rugged components that lower the risk of unplanned plant outages.



Nuclear-qualified components that are rugged, trustworthy and long-lasting

Emerson offers reliable automation technologies that can withstand every area of your nuclear facility—even harsh containment zones. From explosion-proof valves to rugged temperature switches, choose from a variety of nuclear-qualified products, including:

- Direct-acting and pilot-operated solenoid valves for handling oil-free instrument air and inert gases in nuclear power plants.
- Hydramotor® linear actuators for controlling dampers, louvers and process valves.
- Radiation-resistant pressure and temperature switches for applications outside containment zones.
- GO™ Switch proximity sensors for reliable, maintenance-free position feedback on critical operation equipment.



Meet strict industry requirements with nuclear-qualified products

- Choose from a variety of LOCA, Harsh Non-LOCA and Mild constructions
- Exceed post-Fukushima seismic, submergence and environmental requirements
- Work with a supplier that offers extensive in-house testing and qualification capabilities

“My plant has been in operation for over 40 years. I need a reputable supplier that offers retrofits, as well as qualified replacements for obsolete products.”
– Nuclear engineer



Maintain equipment reliability—even in harsh containment areas

- Minimize unplanned downtime with maintenance-free components
- Receive position feedback on critical equipment—reducing time and costs
- Limit REM exposure with switches that eliminate mechanical points of failure

“I don’t want to worry about equipment maintenance—or worse, the unplanned downtime that can happen if a part isn’t working as it should.” – Plant manager for an energy company



Partner with a supplier that ensures you outlast your competition

- Have confidence your products are sourced from the best materials available
- Deploy nuclear-qualified sensors with over 100 years of guaranteed service life
- Seamlessly retrofit your plant with direct-mount replacements for popular components

“In the aftermath of Fukushima, the safety requirements for nuclear reactors are stricter than ever. I prioritize global suppliers that have the resources to test in-house.” – OEM of power plant equipment

With Emerson, you can overcome your nuclear application's toughest challenges.



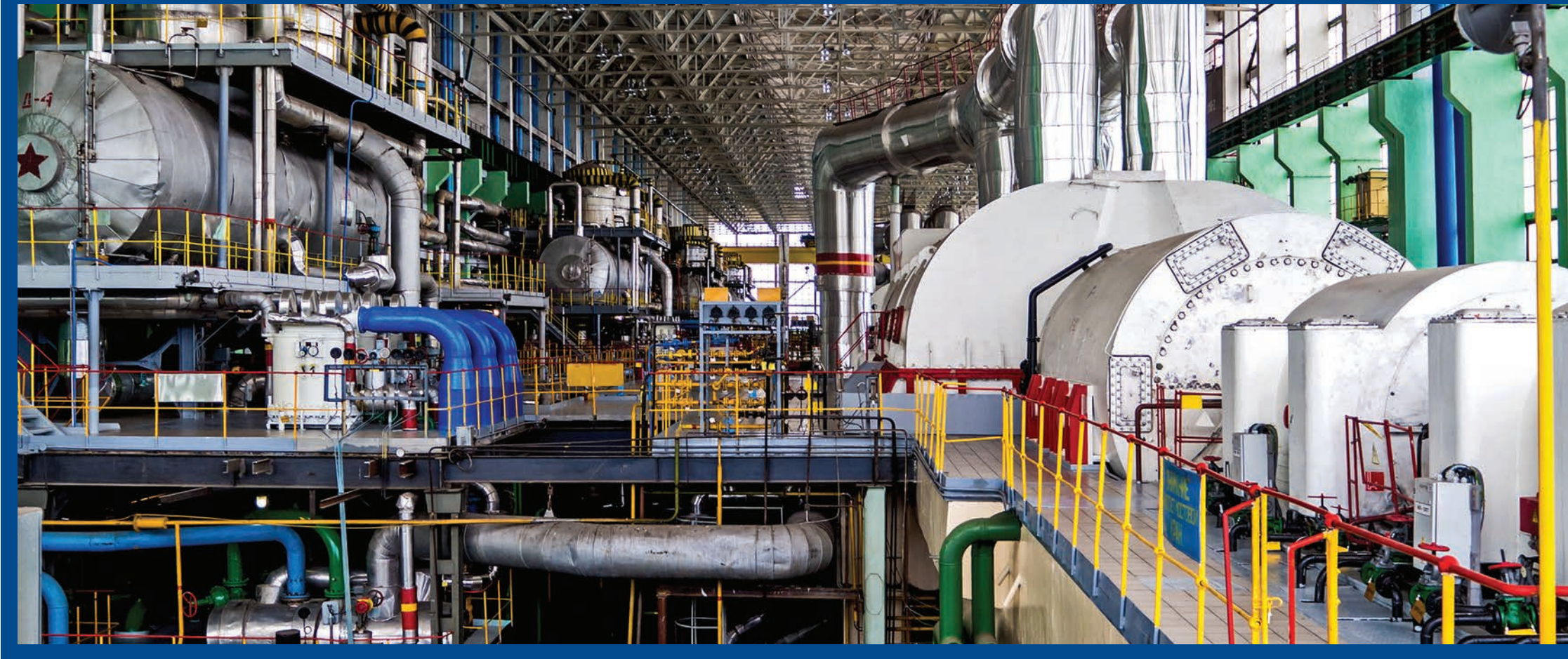
Containment

- Install rugged pilot-operated valves that function with high reliability despite the heat and constant cycling found in pressurized water reactors. [Reliability ▶ p 7](#)
- Reduce worker REM exposure with GO™ Switch—the industry's first proximity sensor qualified for containment zones. [Safety ▶ p 11](#)
- Retrofit existing mechanical limit switches with maintenance-free magnetic switch units. [Upgrade assets ▶ p 5](#)
- Enhance equipment reliability with nuclear-qualified products that promise a qualified life of 106 years. [Reliability ▶ p 7](#)
- Exceed stringent post-Fukushima seismic, vibration and submergence requirements. [Qualifications ▶ p 13](#)
- Eliminate time-consuming and costly switch replacements with “leverless” GO™ Switch devices. [Reliability ▶ p 7](#)
- Lower installation costs with the DXN discrete valve position monitor—a complete, direct-mount valve package for containment zones. [Upgrade assets ▶ p 5](#)



Non-Containment

- Improve plant uptime with environmentally qualified valves—available in a wide range of sizes, materials and pressures. [Qualifications ▶ p 13](#)
- Precisely monitor pressure and temperature with rugged switches, suitable for outside containment areas and balance of plant (BOP) applications. [Reliability ▶ p 7](#)
- Easily install new proximity switches with legacy control systems. [Upgrade assets ▶ p 5](#)
- Deploy modular actuators with minimal service requirements and long service life. [Reliability ▶ p 7](#)
- Work with a supplier that tests all valves, actuators and switches according to thermal, radiation, wear and vibration requirements and accident simulations (LOCA, MSLB and HELB). [Qualifications ▶ p 13](#)



Upgrade Your Assets

As nuclear facilities around the world get older, you need reliable replacements, retrofits and qualified options for obsolete parts.

Learn more. ► p 5

Improve Worker Safety

Protecting workers in hazardous environments is a top priority. Rugged, maintenance-free parts can spare them from unnecessary radiation exposure.

Learn more. ► p 11

Enhance Equipment Reliability

In demanding nuclear applications, reliability is key. Your components must operate as expected, minimize maintenance requirements and reduce risk.

Learn more. ► p 7

Meet Industry Qualifications

In an industry driven by strict regulatory and international standards, you need a single supplier that can design, deliver and dedicate nuclear-qualified parts.

Learn more. ► p 13

Upgrade Your Assets

Nuclear facilities around the world are getting older—which means many parts are nearing the end of their operational lives. By maintaining strict design and quality control over our valves, pressure switches and other nuclear-qualified components, you can be confident any new or upgraded product will seamlessly fit your plant’s existing layout while meeting critical post-Fukushima environmental and seismic qualifications. We also provide alternative solutions for obsolete products and support both retrofits and new-build applications—guaranteeing the long-term success of your operation.



What’s your opportunity?

- Work with a single supplier that manages components over your plant’s life cycle
- Retrofit mechanical limit switches with magnetic, maintenance-free options
- Seamlessly integrate new components with legacy control systems
- Receive obsolescence support for nuclear-qualified products no longer in production



Upgrading your vintage plant with new nuclear-qualified components has never been easier. Connect with an Emerson expert.

As more parts reach the end of their life cycle, you need replacements that are easy to integrate into existing infrastructure. The right solutions not only operate as promised, but can help you extend the life of your plant. Emerson experts can help.

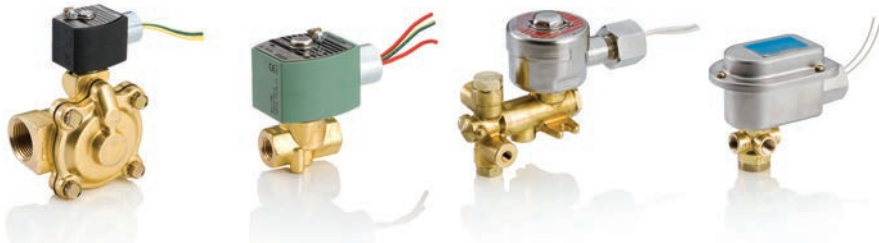


Services offered...

- Obsolescence product management and support
- Local support during design, commissioning and startup
- Ongoing technical support

Featured Solutions for Upgrading Your Assets

ASCO™ Nuclear Power (NP) and Nuclear Service (NS) Direct-Acting Solenoid Valves



These two-, three- and four-way valves are available in brass or stainless steel and include the following IEEE-certified models: NP8210, NP8262, NP8263, NS8300, NP8300, NS8314, NP8314, NS8320, NP8320 and NP8342.

- 1/8, 1/4, 3/8 and 1/2-inch ANPT
- Watertight or explosion-proof enclosures
- Two-way valve types—normally closed or normally open
- Three-way valve types—normally closed, normally open or universal
- Four-way design available with single or dual solenoid

Featured Solutions for Upgrading Your Assets

ASCO™ Nuclear Power (NP) and Nuclear Service (NS) Pilot-Operated Solenoid Valves

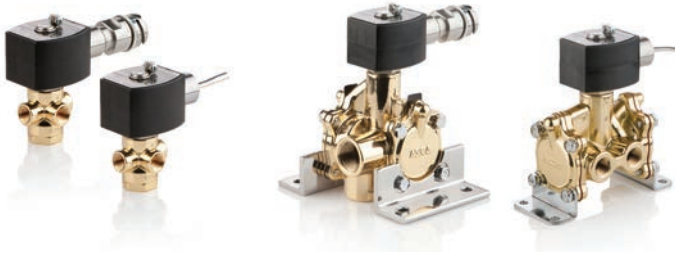


These IEEE-certified valves are suited for high or moderate flow, as well as quick-exhaust applications in nuclear power plants. Models include: Series NP8210, NS8316, NS8321, NP8316, NP8321 and NP8344.

- 1/4, 3/8, 1/2, 3/4 and 1-inch ANPT
- Watertight or explosion-proof enclosures
- Mountable in any position
- Two-way and three-way valve types—normally closed or normally open
- Four-way design available with single or dual solenoid

Featured Solutions for Upgrading Your Assets

ASCO™ Nuclear Valve for AP1000 & IEEE Plants (NT) Direct Acting and Pilot-Operated Solenoid Valve RHIII Coil Construction



The NT Series three-way valve functions as a Class 1E safety-related pilot operator on larger control valves in nuclear power plants. Models include the Series NT8320 (direct acting) and NT8316 (pilot-operated).

- 1/4-inch ANPT (NT8320); 3/8, 1/2, 3/4 and 1-inch ANPT (NT8316)
- Elastomers—diaphragm, gaskets, O-rings and discs
- Designed for integration into digital controls
- Quick Disconnect Connector (QDC) option
- One-piece solenoid/coil design for easy maintenance

Featured Solutions for Upgrading Your Assets

TopWorx™ GO™ Switch TW-180



By utilizing existing brackets, this limit switch makes it quick and easy to retrofit nuclear facilities—eliminating the need to make costly plant modifications and design changes.

- 106-year qualified life
- Hermetically sealed
- Dry contacts available—DPDT
- LOCA, Harsh Non-LOCA and Mild options
- Meets or exceeds global nuclear requirements for existing plants



For more information, visit www.Emerson.com

Enhance Equipment Reliability

We designed our nuclear-qualified parts with reliability in mind—from actuators with few moving internal parts, to “leverless” limit switches that resist physical wear. Many of our products promise a qualified life of over 100 years and are certified to meet the industry’s highest vibration, seismic and submergence requirements. Using our in-house testing and qualification capabilities, we even simulate actual operating and accident conditions—ensuring each part meets its operational demands with minimal risks of delays and downtime.



What’s your opportunity?

- Eliminate unscheduled downtime and related costs
- Deploy rugged products built to handle harsh environmental exposure
- Reduce maintenance requirements with non-contact limit switches
- Avoid unplanned plant outages—thanks to maintenance-free components



Component reliability will determine the success of your plant in this competitive industry. Connect with an Emerson expert.

We designed every nuclear-qualified component with a focus on reliability and performance—no matter how hot, cold, wet, corrosive or explosive its environment. Avoiding unplanned shutdowns and outages lets you maximize your return on investment and reduce risk. Emerson experts can help.



Services offered...

- Local support during design, commissioning and startup
- Onsite testing, diagnostics and maintenance
- Ongoing technical support

Featured Products for Equipment Reliability

ASCO™ Nuclear Power (NP) and Nuclear Service (NS) Direct-Acting Solenoid Valves



These two-, three- and four-way valves are available in brass or stainless steel and include the following IEEE-certified models: NP8210, NP8262, NP8263, NS8300, NP8300, NS8314, NP8314, NS8320, NP8320 and NP8342.

- 1/8, 1/4, 3/8 and 1/2-inch ANPT
- Watertight or explosion-proof enclosures
- Two-way valve types—normally closed or normally open
- Three-way valve types—normally closed, normally open or universal
- Four-way design available with single or dual solenoid

Featured Products for Equipment Reliability

ASCO™ Nuclear Power (NP) and Nuclear Service (NS) Pilot-Operated Solenoid Valves

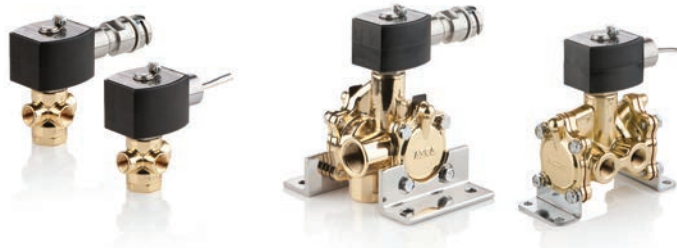


These IEEE-certified valves are suited for high or moderate flow, as well as quick-exhaust applications in nuclear power plants. Models include: Series NP8210, NS8316, NS8321, NP8316, NP8321 and NP8344.

- 1/4, 3/8, 1/2, 3/4 and 1-inch ANPT
- Watertight or explosion-proof enclosures
- Mountable in any position
- Two-way and three-way valve types—normally closed or normally open
- Four-way design available with single or dual solenoid

Featured Products for Equipment Reliability

ASCO™ Nuclear Valve for AP1000 & IEEE Plants (NT) Direct Acting and Pilot-Operated Solenoid Valve RHII Coil Construction



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- 1/4-inch ANPT (NT8320); 3/8, 1/2, 3/4 and 1-inch ANPT (NT8316)
- Elastomers—diaphragm, gaskets, O-rings and discs
- Designed for integration into digital controls
- Quick Disconnect Connector (QDC) option
- One-piece solenoid/coil design for easy maintenance

Featured Products for Equipment Reliability

ASCO™ Pressure and Temperature Switches



These heavy-duty, IEEE-qualified switches are ideal for use outside the containment area to monitor pressure and temperature. Units incorporate the ASCO TRI-POINT balance plate and operate on an alternating fulcrum principle.

- Pressure to 8,000 psig
- Watertight or explosion-proof enclosures
- Vacuum, differential or level control
- Temperature range: 30° to 510° F
- Adjustable, fixed or two-stage fixed deadband units available



For more information, visit www.Emerson.com

Featured Products for Equipment Reliability

ASCO™ NH90 Hydramotor® Linear Actuators



These actuators feature a self-contained, hydraulic power system coupled to a hydraulic cylinder. Units enable efficient and precise linear control of valves, dampers, louvers and other equipment requiring an operating thrust up to 1,500, 3,000 or 4,000 pounds.

- Features few moving internal parts
- Step adapter and coupling options available
- Modular design facilitates service and maintenance
- Includes self-contained, fail-safe unit
- Meets IEEE standards—323, 344, 382 and 627

Featured Products for Equipment Reliability

TopWorx™ GO™ Switch C7/C8 Nuclear



Certified for containment zones, these magnetically actuated proximity switches use dry contacts—eliminating the need for external power and reducing maintenance in hazardous environments. These stainless steel units also meet the highest vibration and submergence requirements in the nuclear industry.

- 106-year qualified life—up to twice the qualified life of competitive products
- Available in Form C Single Pole Double Throw contacts
- Peak operating temperature: 500° F
- LOCA / fully submersible
- Meets AP1000, RCC-E, TBE/KBE LOCA and seismic requirements

Featured Products for Equipment Reliability

TopWorx™ GO™ Switch SV7



This proximity switch can endure high-energy line break (HELB) environments and peak temperatures up to 500 °F. The GO™ Switch technology eliminates the need for external power, as well as maintenance in harsh environments.

- HELB/MSIV qualified
- Available in Form C Single Pole Double Throw contacts
- 106-year qualified life—up to twice the qualified life of competitive products
- Sealed from steam and water ingress
- Meets AP1000, RCC-E, TBE/KBE LOCA and seismic requirements

Featured Products for Equipment Reliability

TopWorx™ GO™ Switch H7/H8 Nuclear



These magnetically actuated proximity sensors are fit for use inside or outside containment zones. They also meet the highest vibration and non-LOCA environmental requirements in the nuclear industry.

- 106-year qualified life—up to twice the qualified life of competitive products
- Available in Form C Single Pole Double Throw and Form CC Double Pole Double Throw contacts
- Exceeds seismic requirements 10G RIM
- Meets AP1000 and IEEE requirements

Featured Products for Equipment Reliability

TopWorx™ GO™ Switch M7/M8 Nuclear



These proximity sensors are engineered for outside containment zones and are critical for safety-related applications. They integrate permanent magnetics, reducing maintenance in critical environments.

- Sealed conduit entry
- 106-year qualified life—up to twice the qualified life of competitive products
- Available in Form C Single Pole Double Throw and Form CC Double Pole Double Throw contacts
- Exceeds seismic requirements 10G RIM
- Meets AP1000 and IEEE requirements

Featured Products for Equipment Reliability

TopWorx™ DXN Discrete Valve Position Monitor



Qualified for containment, harsh and mild zones, this monitor is an ideal solution for quarter-turn air-operated valves (AOV). It integrates two GO™ Switches, as well as a ceramic terminal strip for convenient wiring, and mounts directly onto the actuator.

- 106-year qualified life
- Eliminates separate junction box
- Reduces ingress and other failure points
- Exceeds LOCA and seismic requirements 10G RIM
- Qualifications: LOCA, IEEE/Gen 2 and 3/ AP1000/ RCC-E/CANDU/Qinshan

Featured Products for Equipment Reliability

TopWorx™ GO™ Switch TW-180



By utilizing existing brackets, this limit switch makes it quick and easy to retrofit nuclear facilities—eliminating the need to make costly plant modifications and design changes.

- 106-year qualified life
- Hermetically sealed
- Dry contacts available—DPDT
- LOCA, Harsh Non-LOCA and Mild options
- Meets or exceeds global nuclear requirements for existing plants



For more information, visit www.Emerson.com

Improve Worker Safety

Our TopWorx™ GO™ Switch eliminates the need to make switch adjustments and repairs—reducing worker REM exposure in accordance with ALARA safety requirements. These devices utilize a magnetic spring in place of a physical one, leading to high repeatability and avoiding points of environmental and physical wear. Once installed, you no longer have to worry about maintenance issues causing an unplanned outage—letting you focus on high-priority tasks in a stress-free environment.



What's your opportunity?

- Reduce maintenance operations—limiting worker REM exposure
- Maintain ALARA compliance
- Retrofit existing lever arm switches with direct-mount replacements
- Avoid unplanned plant outages and downtime



Keep your team safe with switch solutions that eliminate the need for visual position confirmation. Connect with an Emerson expert.

By providing position feedback on critical operation equipment, our nuclear-qualified GO™ Switches spare personnel from hazardous areas—reducing radiation exposure and helping your operation adhere to ALARA standards. Emerson experts can help.



Services offered...

- Local support during design, commissioning and startup
- Ongoing technical support

Featured Products for Worker Safety

TopWorx™ GO™ Switch C7/C8 Nuclear



Certified for containment zones, these magnetically actuated proximity switches use dry contacts—eliminating the need for external power and reducing maintenance in hazardous environments. These stainless steel units also meet the highest vibration and submergence requirements in the nuclear industry.

- 106-year qualified life—up to twice the qualified life of competitive products
- Available in Form C Single Pole Double Throw contacts
- Peak operating temperature: 500° F
- LOCA / fully submersible
- Meets AP1000, RCC-E, TBE/KBE LOCA and seismic requirements

TopWorx™ GO™ Switch SV7



This proximity switch can endure high-energy line break (HELB) environments and peak temperatures up to 500 °F. The GO™ Switch technology eliminates the need for external power, as well as maintenance in harsh environments.

- HELB/MSIV qualified
- Available in Form C Single Pole Double Throw contacts
- 106-year qualified life—up to twice the qualified life of competitive products
- Sealed from steam and water ingress
- Meets AP1000, RCC-E, TBE/KBE LOCA and seismic requirements

TopWorx™ GO™ Switch H7/H8 Nuclear



These magnetically actuated proximity sensors are fit for use inside or outside containment zones. They also meet the highest vibration and non-LOCA environmental requirements in the nuclear industry.

- 106-year qualified life—up to twice the qualified life of competitive products
- Available in Form C Single Pole Double Throw and Form CC Double Pole Double Throw contacts
- Exceeds seismic requirements 10G RIM
- Meets AP1000 and IEEE requirements

Featured Products for Worker Safety

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These proximity sensors are engineered for outside containment zones and are critical for safety-related applications. They integrate permanent magnetics, reducing maintenance in critical environments.

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TopWorx™ DXN Discrete Valve Position Monitor



Qualified for containment, harsh and mild zones, this monitor is an ideal solution for quarter-turn air-operated valves (AOV). It integrates two GO™ Switches, as well as a ceramic terminal strip for convenient wiring, and mounts directly onto the actuator.

- 106-year qualified life
- Eliminates separate junction box
- Reduces ingress and other failure points
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- Qualifications: LOCA, IEEE/Gen 2 and 3/ AP1000/ RCC-E/CANDU/ Qinshan

TopWorx™ GO™ Switch TW-180



By utilizing existing brackets, this limit switch makes it quick and easy to retrofit nuclear facilities—eliminating the need to make costly plant modifications and design changes.

- 106-year qualified life
- Hermetically sealed
- Dry contacts available—DPDT
- LOCA, Harsh Non-LOCA and Mild options
- Meets or exceeds global nuclear requirements for existing plants



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Meet Industry Qualifications

A global name in nuclear, Emerson has the in-house testing resources and capabilities to design, deliver and dedicate nuclear-qualified components for facilities around the world. Designed for environments with high radiation, temperatures and seismic conditions, our products meet the rigorous requirements of standards like IEEE, RCC-E, JEAC—and more. In addition, our quality assurance programs comply with the most exacting regulatory requirements, such as 10 CFR 50, Appendix B, and we inspect all products prior to shipment—confirming their reliability and performance no matter your application.



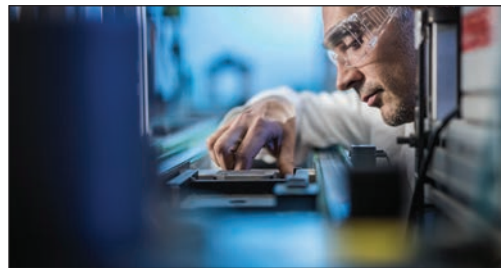
What's your opportunity?

- Ensure compliance with all international certifications and nuclear standards
- Meet qualification project requirements, codes and standards
- Reap the benefits of Emerson in-house testing capabilities



Partner with a supplier that designs, delivers and dedicates nuclear-qualified components . Connect with an Emerson expert.

No component leaves our factories until we demonstrate its ability to fulfill all required functions—leading to worry-free operation in the harshest environments. Emerson experts can help.

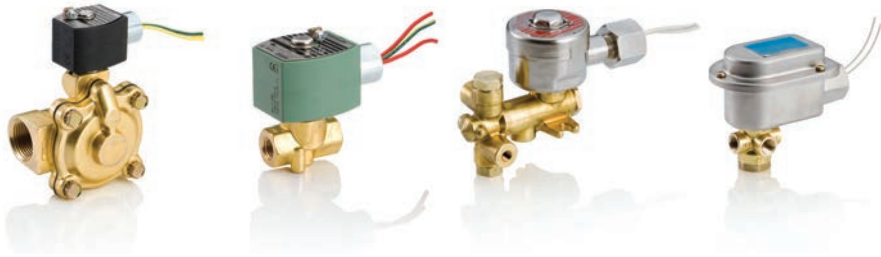


Services offered...

- Global manufacturing capabilities
- In-house testing, including vibration, seismic, temperature—and more
- Local product support during design, commissioning and startup
- Quality assurance—10 CFR 50, Appendix B; JEAC4111-2003; and SGAQ-EDF
- Ongoing technical support

Featured Products that Meet Strict Qualifications

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- 1/8, 1/4, 3/8 and 1/2-inch ANPT
- Watertight or explosion-proof enclosures
- Two-way valve types—normally closed or normally open
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- Four-way design available with single or dual solenoid

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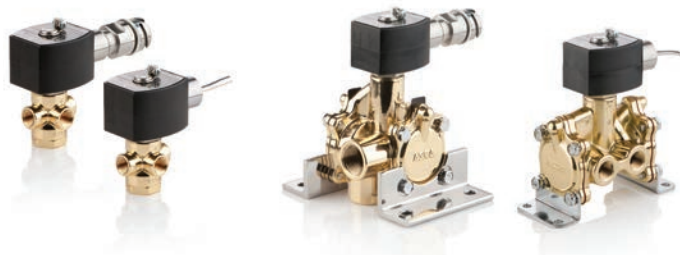


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Featured Products that Meet Strict Qualifications

TopWorx™ GO™ Switch C7/C8 Nuclear



Certified for containment zones, these magnetically actuated proximity switches use dry contacts—eliminating the need for external power and reducing maintenance in hazardous environments. These stainless steel units also meet the highest vibration and submergence requirements in the nuclear industry.

- 106-year qualified life—up to twice the qualified life of competitive products
- Available in Form C Single Pole Double Throw contacts
- Peak operating temperature: 500° F
- LOCA / fully submersible
- Meets AP1000, RCC-E, TBE/KBE LOCA and seismic requirements

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A distinct, expert offering backed by the experience and resources of Emerson

We, at Emerson, are forward-thinkers—ready to help you with smart technologies, unmatched product reliability and a proactive, consultative partnership approach designed to improve your performance.

Working with Emerson means you can innovate your process business operations without incurring unnecessary risk. Emerson experts understand the critical reliability required for your industry and foresee how to improve your business. With our expertise, your resources can be free to focus elsewhere.



Plan & Design

- Producing with Certainty and Agility
- Online product & CAD configurators



Implement & Build

- Application-specific expert consultations
- Ready-to-install customized packages



Sales & Service Channels

- Extensive global channel network
- Technically laden automation solutions experts



Education & Training

- Educational courses for product and technology enhancements
- Learning and training centers for workforce improvement





As a global company and single-supplier, we combine an extensive product offering with invaluable industry expertise to provide reliable service whenever and wherever you need it.





Get started



Emerson delivers time-tested and innovative fluid automation solutions for the nuclear industry to help you optimize your production process while achieving the highest levels of reliability and functional safety. Contact us now for world-class technologies and services that can maximize your upstream, midstream or downstream operation. Getting started is easy.

Visit us: [Emerson.com](https://www.emerson.com)

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