

TopWorx™ GO™ Switch

from the Nuclear Parts Center

Field-proven qualified proximity switch designed to mitigate failure risks



Challenge

Failure of mechanical lever-arm switches used to provide component position indication is challenging the nuclear industry to evaluate replacement options. Utilities are seeking a solution to increase safety, reliability and operational performance while reducing dose and labor.

Solution

Framatome's Nuclear Parts Center is the prime channel to the nuclear industry for TopWorx's true proximity switch, which eliminates direct contact actuation. The TopWorx™ GO™ switch contains no mechanical latches, but uses a simple system of internal magnets to create a "magnetic spring" to provide a contact state change when the target magnet is moved to activate/de-activate the switch. This design minimizes wear items and mitigates equipment failure risks.

TopWorx™ designed the first qualified proximity switch and has provided the switch to the nuclear industry for more than a decade. The switch is field-proven with more than 10,000 GO™ Switches installed in nuclear plants worldwide with applications across the plant.

Customer benefits

- Reduction in overall failure modes by eliminating physical contact for position switch actuation
- Increased position switch reliability results in fewer work orders and containment entries to make repairs during the plant fuel cycle
- Significant personnel dose savings due to shorter switch installation and set up time
- Limited valve stroking required for set up, reduces potential wear on valves (i.e., MSIVs)
- Supports short stroke valve applications by allowing a radial and axial configuration of switch and target magnet
- Reduction in outage work scope due to increased proximity service life
- Reduction in overall number of unique position switch models used in plants reduces inventory and provides more versatile use of spares
- Widely used throughout the global nuclear industry, the TopWorx™ switch offers extensive product experience and proven support

Your performance
is **our** everyday **commitment**

TopWorx™ GO™ Switches

- Available in SPDT (Form C) and DPDT (Form CC) contact arrangements
- Qualified life of 40+ years for many applications¹
- Qualification conforms to IEEE Standards 323-2003, 344-2004, 382-2006 and 572-1985²
- Manufactured under Quality Assurance program meeting the requirements of 10CFR50 Appendix B, certified in accordance with ISO 9001:2015, and by NUPIC approved supplier
- Custom bracket designs available



Target Magnets

TopWorx™ target magnets are made of Samarium Cobalt (SmCo5), which is a rare earth magnet that exhibits high magnetic field strength even at temperatures greater than 500°F.

Qualified target magnets come in two different sizes. The larger the magnet, the greater the magnetic field strength, which for proximity switches equates to greater sensing distances.

Target Magnets Standard Sensing Ranges for H-7, SV-7 and M-7 Switches

Operating Distance with C-AMS7A Standard Range Target

Average Sensing	0.100" ±0.020"
Average Reset	0.023" ±0.010"
Repeatable to	0.002"

Operating Distance with C-AMS12 Extended Range Target

Average Sensing	0.250" ±0.025"
Average Reset	0.031" ±0.015"
Repeatable to	0.002"

¹Qualified life of 40+ years is credible based on an ambient room temperature of 120°F and load less than or equal to 5 Amps. Equipment life values are subject to the limitations, installation and maintenance activities prescribed by the manufacturer and Framatome.

²Records of tests and analyses produced under the TopWorx™ EQ Program also clarify their sufficiency to support customer commitments to prior versions of IEEE standards, notably IEEE 323-1974 and IEEE 344-1975.



C-7 LOCA/Harsh (Submerged and non-submerged)

The C-7 proximity switch is designed for use in containment and can withstand a Loss of Coolant Accident (LOCA) event for up to one year (non-submerged) and up to 30 days (submerged). It is certified to meet the highest vibration and seismic requirements in the nuclear industry.

Features:

- LOCA/fully submersible — hermetically sealed
- Exceeds global and Post Fukushima seismic requirements 10G RIM
- Operating temperatures and pressures up to 250°F (121°C) and 75 psig.
- LOCA peak of greater than 437°F (225°C)
- Total integrated dose of 213 megarads gamma



H-7 Non-LOCA/Harsh Environment

The H-7 proximity switch is designed for use in or outside containment in non-LOCA applications. It has the pedigree to meet the highest vibration and seismic requirements in the nuclear industry.

Features:

- Exceeds global environmental non-LOCA and Post Fukushima seismic requirements 10G RIM
- Operating temperatures up to 250°F (121°C) and 100% relative humidity
- Fully enclosed 303 stainless steel housing
- Total integrated dose of 220 megarads gamma



SV-7 Severe Service/HELB Environment

Designed to endure a high energy line break (HELB) environment, the SV-7 proximity switch can withstand 260°C (500°F) peak temperature during a HELB and operate continually at a temperature of 204°C (400°F).

Features:

- Sealed from steam leaks and water ingress
- Exceeds global environmental HELB non-LOCA and Post Fukushima seismic requirements 10G RIM
- HELB Pedigree and Qualification
- Operating temperatures up to 250°F (121°C) and 100% relative humidity
- HELB transient peak of greater than 500°F (260°C)
- Total integrated dose of 213 megarads gamma



M-7 Mild Environment Applications

The M-7 is specifically designed for mild environment applications and critical to operations balance-of-plant applications. It is certified to meet the highest vibration and seismic requirements in the nuclear industry.

Features:

- Exceeds global seismic requirements 10G RIM
- Fully enclosed 303 stainless steel housing sealed from steam leaks and water ingress
- Operating temperatures up to 250°F (121°C) and 100% relative humidity
- Total integrated dose of 44.2 megarads gamma



Framatome Advantage

To provide you with the right switch to match your application, Framatome offers a complete family of qualified switches. Our offerings include the TopWorx™ C-7, SV-7, H-7 and M-7 switches. In addition, the GO™ Switch TW180 has been designed to meet vintage plants' fit, form and function retrofit requirements, reducing the need for a plant modification/design change for retrofit and upgrade installations. Finally, for 50.69 RISC-3 applications, please contact us for more information on the supply of commercial switches.

Through the NPC's online Customer Inquiry System (npc.framatome.com), utilities can connect with Framatome for 24/7/365 access to our inventory, reducing lead-times and providing real-time pricing. As a premier provider of nuclear service, Framatome is committed to enhancing safety and efficiency for the world's nuclear power plants. We combine innovative technology with a tireless commitment to responsiveness and reliable performance — all to help you succeed.



Scan to
view our parts on the web:
npc.framatome.com

Off-hours cell phone: 434.610.3880



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