



NuProx™

NuProx Switches are qualified for applications in nuclear power generating plants for monitoring valve or other equipment open, closed or stroke positions. **NuProx** Switches feature Single Pole Double Throw (SPDT) dry contacts and do not require a power source. They may be wired in series or parallel without voltage drop or reduction in current flow. **NuProx** Switches operate on the principle of magnetism, detecting a Target Magnet when it enters the sensing area. **NuProx** Switches use permanent magnets that, when actuated by the presence of the Target Magnet, change the state of the electrical contacts from Normally Closed (N/C) to Normally Open (N/O). **NuProx** Switches must be installed with Target Magnets.

Mounting & Adjusting

1. Operate valve (or other equipment) to the position where it is to be monitored.

2. Mount the NuProx Switch and Target Magnet to a rigid bracket. Stainless Steel, with a thickness of 11 gauge, is generally suitable for valve monitoring. Consult the valve/equipment supplier or TopWorx for availability of pre-designed brackets.

3. Align the Switch and Target Magnet so they are on axis (or in-line) with one another.

Note: It is acceptable for the Target Magnet to approach the Switch from any direction. However, the Switch and Target Magnet must be on axis in the monitoring position. The Switch and Target Magnet are not position sensitive.

4. Adjust the "Switch Operating Distance" gap between the end of the Switch and the Target Magnet. The gap must not exceed 0.090" (2.3mm). A TopWorx 0.090" feeler gauge is provided with the Switch.

5. Tighten the Switch and Target Magnet jam nuts to the following torques:

Switch.....	18-25 ft. lbs.
Target Magnet.....	8 -12 ft. lbs.

Terminations & Connections

1. The N7 Switch is furnished with four 16 AWG leads and the P7 with four 18 AWG. They are: N/O, N/C, Common, and a Ground welded to the case. Various standard lead lengths are available as options. NuProx Switches shall be installed with Qualified conduit seals and splices or Qualified connectors.

2. Clean conduit or connector and Switch entrance threads with solvent.

3. Apply a Qualified thread sealant to conduit or connector and Switch conduit entrance.

4. Immediately thread components together by hand. Use two wrenches to tighten, with one on the Switch's conduit hub and the other on the conduit or connector. Tighten sufficiently but do not exceed 15 ft. lbs..

Maintenance

NuProx Switches are permanently sealed in stainless steel housings. They do not have gaskets, o-rings or seals. Target Magnets are rare earth samarium cobalt locked in stainless steel housings. The NuProx Switch and Target Magnet have no serviceable components.

Periodic Surveillance

1. Inspection

Inspect the NuProx Switch and Target Magnet for: corrosion, tightness of jam nuts, and conduit/connectors. Dust on the Switch and Target magnet will not affect their performance. Check the "Switch Operating Distance" gap between the Switch and Target Magnet using the 0.090" feeler gauge furnished with the Switch or other suitable gauge.

2. Operational Test

Periodically (minimum, every 12 to 18 months) cycle the valve or equipment and check switch performance.

Replacement Schedule

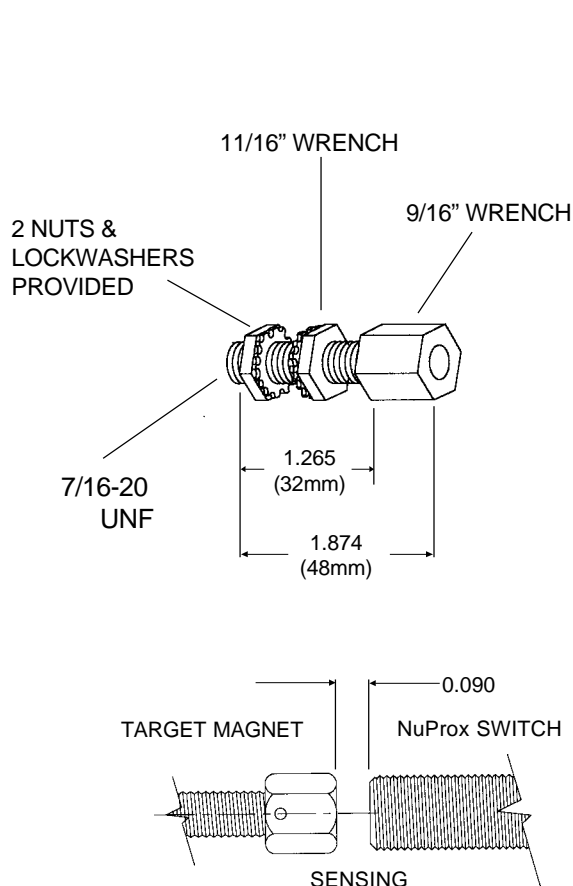
1. Service Life vs. Operating Temperature

NuProx N7 and P7 Switch's Qualified Life were established using the Arrhenius Methodology through Thermal Aging Testing at an elevated temperature. Service life is dependant on the application's operating temperature. Qualification Test Reports 11840-QTR for the N7 Switch and 12200-QTR for the P7 Switch provide Arrhenius equations. We recommend that N7 and P7 Switches be replaced with new switches of the same part number at the end of their service life.

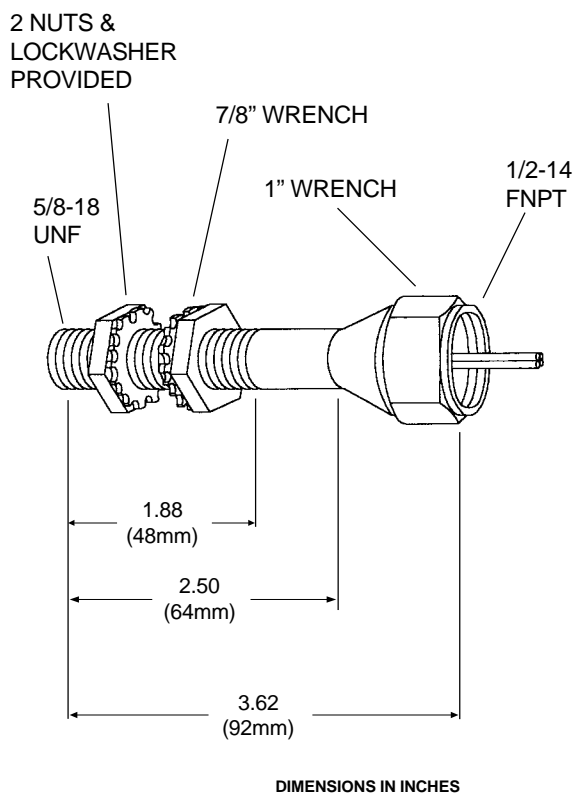
2. Service Life vs. Radiation Exposure

NuProx N7 and P7 Switch's Qualified Life were based on Total Integrated Dose (TID) of gamma radiation exposure equal to that which they would experience over the 10 year life and for the N7 Switch, followed by Loss Of Coolant Accident (LOCA) radiation. In order to determine the radiation exposure service life, the postulated LOCA radiation dose must be known and subtracted from the qualified TID. We recommend replacing the N7 and P7 with new switches of the same part number at the end of their life.

TARGET MAGNET



NuProx SWITCH



Switch Operating Distance:

Average Sensing	0.150" ± 0.031"
Average Reset	0.060" ± 0.015"
Repeatable to	0.002"

Sensing:

Sensing occurs when Target Magnet and Switch are on axis as shown.

Temperature:

Qualified 10 years, 50°C
Rated at 204°C Max.

Contacts:

Qualified: 1.0 amp, 48 VDC
Ratings:

AC	Volts	120	240		
	Amps	4.0	2.0		
DC	Volts	24	48	120	250
	Amps	3.0	1.0	0.5	0.5

Qualification Test Reports: NuProx N7 switch: 11840-QTR, NuProx P7 switch: 12200-QTR

WARRANTY TOPWORX Inc., warrants that each item of new equipment manufactured by it will be free from defects in material and workmanship under normal use and service; its obligation under this Warranty, being limited to making good, at its factory, and part of parts thereof, which shall be returned to it with transportation charges prepaid by the original purchaser, and which its examination shall disclose to its satisfaction to have been thus defective. TOPWORX, Inc., however, assumes no risk or liability for results of the use of the products purchased from it.

This Warranty is in lieu of all other Warranties, whether of merchantability fitness, or otherwise expressed or implied, and all other obligations or liabilities and TopWorx Inc., neither assumes, nor authorizes any person to assume for any other liability in connection with the sale of this equipment.

No claims for labor in replacing defective parts and equipment and consequential damages will be allowed by the company.

This Warranty shall not apply to equipment which has been subjected to misuse, negligence or accident.

This Warranty shall not apply to any equipment which shall have been repaired or altered, outside the Company's factory so as to affect such equipment's stability or reliability in the judgment of the Company.

DISCLAIMER and NUCLEAR INDEMNITY Final determination of the suitability of any information or product for the use contemplated by any user is the sole responsibility of the user. If the products are to be used in any nuclear installation or activity the purchaser, defined as but not limited to TOPWORX Distributor, Representative or Agent shall, or cause the ultimate user to a) secure and maintain the maximum nuclear damage and liability insurance protection available, b) enter into and maintain a Government Indemnity Agreement and, c) waive and require its insurers to waive all rights of recovery or subrogation against Seller and Suppliers and subcontractors or every tier for, and indemnify and hold Seller harmless from and against, any claims, losses or damages whatsoever, including contractual or special damages of any kind arising from a nuclear incident as that term is defined in the Atomic Energy Act of 1954, as amended.