

The De Facto Standard in Fire
Sprinkler Corrosion Control™

WET PIPE
NITROGEN
INERTING

WPNI

Corrosion Control for Wet Pipe Fire Sprinkler Systems



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Engineered
Corrosion
Solutions™

Complete Corrosion Control.

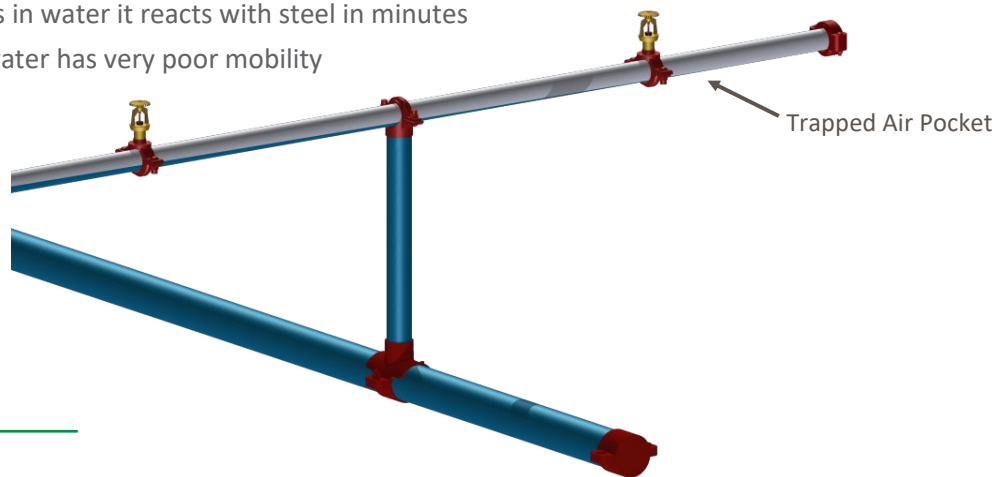
THE CHEMISTRY OF CORROSION

Wet Pipe Fire Sprinkler Systems

CORROSION AT THE AIR-WATER INTERFACE

There are three (3) physical attributes of oxygen that explain why almost all corrosion in wet pipe fire sprinkler systems occurs in close proximity to trapped air pockets:

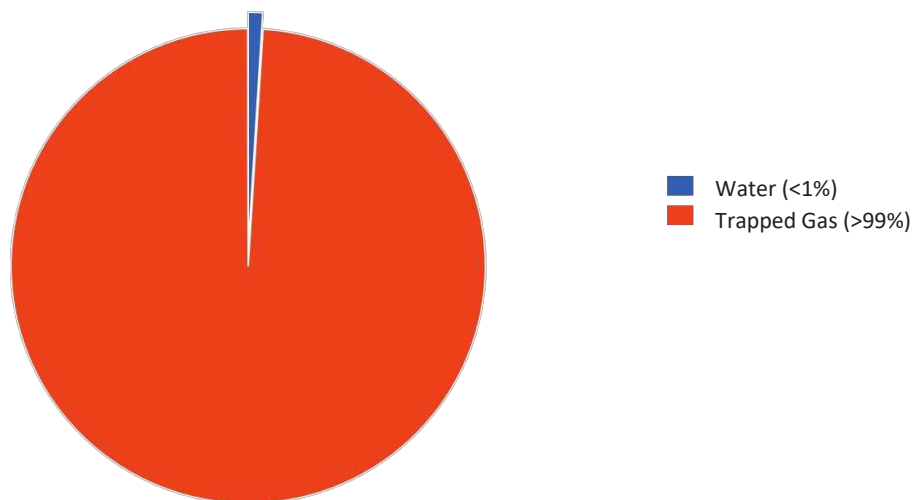
- 1) Oxygen gas exhibits very low solubility in water
- 2) Once oxygen gas dissolves in water it reacts with steel in minutes
- 3) Oxygen gas dissolved in water has very poor mobility



REMOVE THE GAS

There is at least **5,000 times more oxygen** available for corrosion in the trapped gas of a wet pipe fire sprinkler system than there is in the source water. Source water contains only 10 parts per million of dissolved oxygen which is 0.001% of water volume. Focusing on the very small amount of oxygen contained in the incoming water supply is costly, inefficient, and unproductive.

**Source of Oxygen
Wet Pipe Sprinkler Systems**



THE ECS ADVANTAGE

Cost Effective Technology Leader

SIMPLE AND SAFE CORROSION CONTROL

- Minimal equipment installation
- No chemical additives or coatings
- Solution for both new and existing systems

INDUSTRY LEADING VENT EQUIPMENT

- Patented vent design requires no plumbing to drain with no leak risk
- Lightest weight, lowest profile redundant vent available
- Ability to inspect device functionality from the ground

SUPERIOR CUSTOMER SERVICE AND PRODUCT SUPPORT

- Single engineer point of contact for every project
- Excellent lead times - maximum 72 hours from purchase order to shipment
- Project commissioning and training available with every nitrogen project

PROVEN RESULTS

- Long term wet pipe nitrogen inerting case histories since 2010
- Officially recognized solution by NFPA and FM Global
- Similar technology used to control corrosion in other industries for decades

SIGNIFICANT COST AND RISK REDUCTION



CASE STUDY: Mission Critical Aerospace Manufacturing

- Twenty-five (25) wet pipe systems protecting 1 million square feet
- Extensive pipe failure history; averaged 1 pipe leak every 2 weeks
- All systems flushed and inerted with nitrogen in 2010
- One (1) recorded leak since systems were inerted
- No extensive pipe or full system replacement required

CASE STUDY: Large Covered Mall

- Thirty-six (36) wet pipe systems protecting 1.2 million square feet
- Mall opened in 2001; averaged multiple pipe leaks per month
- Repaired existing pipe leaks and inerted with nitrogen in 2012
- One (1) recorded leak since systems were inerted
- No extensive pipe or full system replacement required

WET PIPE NITROGEN INERTING

Maximum Protection Against Corrosion

WHAT IS WET PIPE NITROGEN INERTING (WPNI)?

WPNI is a process that displaces oxygen, which causes corrosion, with nitrogen gas inside wet pipe fire sprinkler systems. Any trapped gas remaining in the system after the WPNI process is not corrosive.

The process of using an inert gas provides a **higher level of protection against corrosion** when compared to only using automatic air vents because it is nearly impossible to remove all trapped oxygen from a wet pipe fire sprinkler system, even when multiple vents are installed.

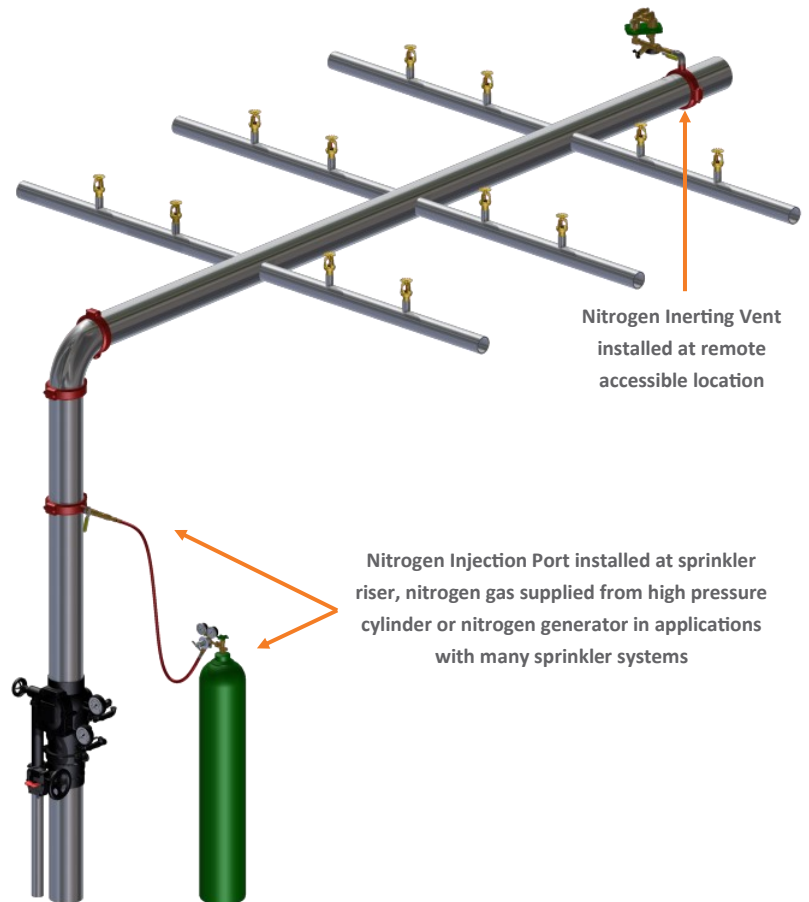
WHAT EQUIPMENT IS REQUIRED FOR WPNI?

Three (3) essential components are needed:

- 1) An integral venting device to remove oxygen installed at a remote accessible high point
- 2) A nitrogen injection port installed at the sprinkler riser
- 3) A source of nitrogen gas - either nitrogen cylinders or a nitrogen generator

WHY IS A VENT NEEDED FOR WPNI?

- 1) The vent provides a remote location to **exhaust oxygen gas** from system piping after filling with nitrogen which facilitates gas mixing within system piping.
- 2) The vent provides an integrated gas sampling port to **verify nitrogen concentration** at the remote portion of the sprinkler system during the WPNI process.
- 3) The vent **prevents false alarms and improves hydraulic performance** in the system by automatically exhausting trapped gas from the sprinkler system as it fills with water.
- 4) The **vent acts as a failsafe**; in the event that a nitrogen atmosphere is not maintained the vent still provides an automatic mechanism for removing trapped oxygen from the sprinkler system.



Typical WPNI System Configuration - equipment installed at two locations

VENTING DEVICES

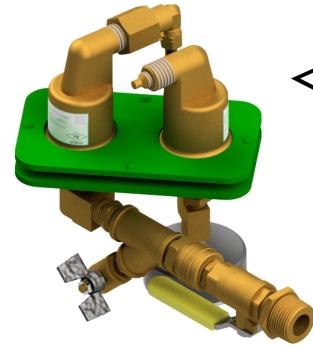
Remove Trapped Gas

ECS Ejector Automatic Air Vent (PAV-W)

- Patented redundant design means no plumbing to drain
- Pressure gauge monitors primary float valve
- Optional electronic monitoring
- Rated up to 175 psig
- FM Approved

Specifications

- System Connection: 1" NPT, Male
- Dimensions: 14" (L) x 7" (D) x 7" (H)
- Weight: 8 lbs.
- Clear Height: 5"

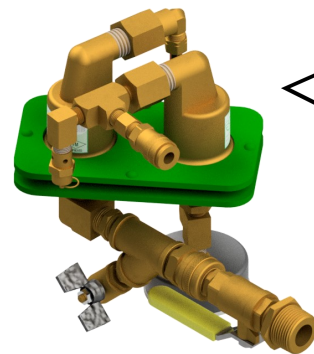


ECS Protector Nitrogen Inerting Vent (PAV-WN)

- Required for Wet Pipe Nitrogen Inerting (WPNI)
- Includes nitrogen injection port
- Patented redundant design means no plumbing to drain
- Pressure gauge monitors primary float valve
- Optional electronic monitoring
- Rated up to 175 psig
- FM Approved

Specifications

- System Connection: 1" NPT, Male
- Dimensions: 14.5" (L) x 7.5" (D) x 9" (H)
- Weight: 10 lbs.
- Clear Height: 5.5"



WET SYSTEM ACCESSORIES

Monitoring Devices and Nitrogen Kits

Nitrogen Inerting Start-up Kit (NISK-1)

- Essential components for wet pipe nitrogen inerting (WPNI)
- 3/8" kink resistant rubber hose rated for 300 psig
- Industrial grade nitrogen cylinder regulator rated for 3000 psig
- Industrial grade brass couplers
- Ensures nitrogen gas is safely transferred from nitrogen cylinder to fire sprinkler system



ECS Protector Handheld Gas Analyzer (PHGA-1)

- Handheld battery powered device verifies nitrogen purity during wet pipe nitrogen inerting (WPNI) process
- Measures gas concentration at vent sampling port
- Features one button self-calibration



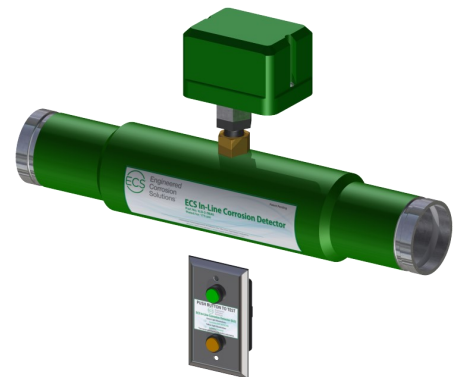
ECS Remote Inerting Station (RIS-1)

- Allows for nitrogen inerting functions from accessible location near floor
- Nitrogen gas purity sampling
- Monitor system pressure
- Remove trapped water from vent assembly
- Relocate vent assembly exhaust gases when venting to atmosphere is undesirable



ECS In-Line Corrosion Detector (ILD)

- Only device that provides continuous real-time corrosion monitoring of a fire sprinkler system
- UL Listed
- Matches size, schedule, and material of system piping
- Provides 360° surface area to detect internal corrosion
- Thin wall section monitored by UL Listed/FM Approved pressure switch
- Includes remote test station, can be monitored remotely and with fire alarm or building automation systems

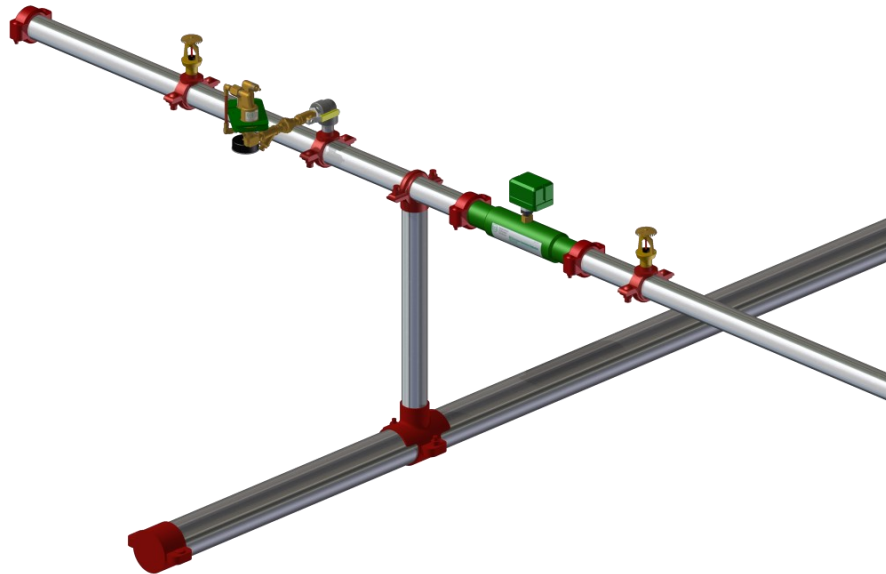


NOTE

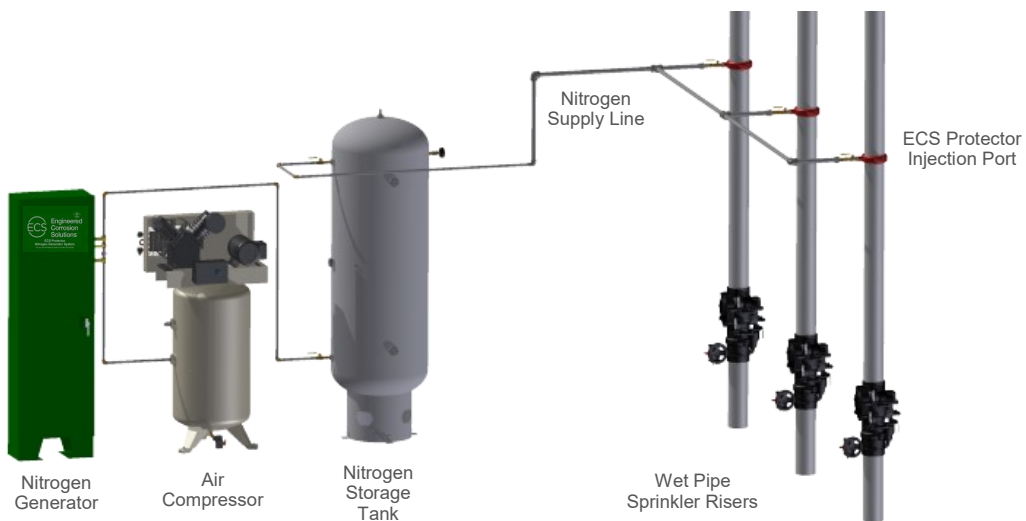
- At least one (1) In-Line Corrosion Detector recommended per project
- In-Line Corrosion Detector typically installed on wet system branch lines at air/water interface
- One (1) Handheld Gas Analyzer recommended per WPNI project
- At least one (1) Nitrogen Inerting Start-up Kit recommended per WPNI project, multiple kits recommended for projects with many sprinkler systems to decrease time required for WPNI

PRODUCT INSTALLATION

Venting Devices and Accessories



Nitrogen Inerting Vent Installed on Remote Sprinkler Main and In-line Corrosion Detector Installed on Branch Line at Air/Water Interface



Permanent High Capacity Nitrogen Generator, Air Compressor, and Storage Tank Provides Plant Nitrogen to Fire Sprinkler System

WET SYSTEM CORROSION CONTROL

Vent Selection Guide

	PAV-W Automatic Air Vent	PAV-WN Nitrogen Inerting Vent
Designed for Overhead Sprinkler Systems	✓	✓
Removes Corrosive Trapped Oxygen	✓	✓
Redundant Float Valve Design ⁽¹⁾	✓	✓
Visual Indicator for Primary Valve ⁽²⁾	✓	✓
Supports Wet Pipe Nitrogen Inerting		✓
Includes Nitrogen Injection Port		✓
FM Approved	✓	✓
Meets NFPA 13 Vent Requirement	✓	✓

Notes

- (1) Patented design prevents water discharge and does not require plumbing to drain
- (2) PAV-W and PAV-WN visual indicator can be viewed from the floor up to 30 feet below

CONTACT US

Contact ECS Monday thru Friday, 8 AM - 5 PM (central time zone) to have a **project specific quote returned in four (4) business hours or less**. Your project will be reviewed by an ECS engineer to ensure the most cost effective solution is provided.

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