For use under U.S. Patents 8,720,591, 9,144,700 and 9,186,533

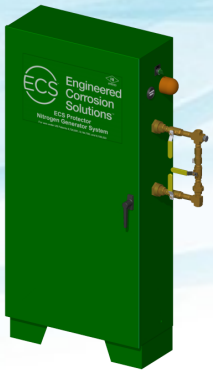
ECS Protector Nitrogen Generator PGEN-30 (PGEN-30E)

Specifications

Dimensions (cabinet):	24.5”(W) x 52.5”(H) x 8.5”(D) (622mm(W) x 1,334mm(H) x 216mm(D))
Dimensions (incl. bypass):	32.5”(W) x 52.5”(H) x 8.5”(D) (826mm(W) x 1,334mm(H) x 216mm(D))
Weight:	152 Lbs (69 Kg)
Temperature Range:	40°F - 105°F (5°C - 40°C)
Power Supply:	120v/1 phase/60Hz - Dedicated Circuit (230v/1 phase/50Hz - Dedicated Circuit)
Power Consumption:	2 Amps
Gas Connections:	Air Inlet - ½” NPT Female Nitrogen Outlet - ½” NPT Female
Drain Connection:	¼” NPT Female
	UL 508A Listed Industrial Control Panel

Ordering Information

Stock Number:	PGEN-30 (PGEN-30E)
Replacement Filters:	PGEN-FKS - Annual Maintenance
Gas Membrane:	PGEN-MS - 20 Year Expected Service Life)



General Description

The ECS Protector Nitrogen Generator is designed for use in maintaining supervisory gas and facilitating the **Dry Pipe Nitrogen Inerting (DPNI)** process for controlling oxygen corrosion in dry and pre-action fire sprinkler systems. The ECS Protector is an on-site nitrogen generation system that is designed to be installed inline between the compressed air supply and the sprinkler system riser in dry or preaction pipe sprinkler systems. The nitrogen generator utilizes membrane gas separation technology that exhausts oxygen as a waste gas to produce 98%+ nitrogen on demand with no nitrogen storage necessary for dry or preaction systems.

The ECS Protector Nitrogen Generator cabinet has an external bypass valve to allow for nitrogen generator maintenance or “fast fill” needs, and is designed to meet the NFPA 13 30-minute fill requirement for dry pipe or preaction fire protection systems.

The ECS Protector Nitrogen Generator facilitates the patented "fill and purge" breathing process in the fire sprinkler system when paired with a venting device installed on the sprinkler riser such as the ECS Protector Manual Vent (PAV-D) or the ECS Protector Dry SMART Vent (PSV-D/DE) for dry and preaction systems.

The ECS Nitrogen Generator unit that includes the following components:

- Steel enclosure cabinet with membrane type nitrogen generator (no nitrogen gas storage) and manual bypass
- Power supply - 120 VAC/1 phase/60Hz
  (230 VAC/1 phase/50Hz)
- Single point nitrogen/air discharge – ½" NPT
- Hour Run Meter
- Cycle Counter

The ECS Nitrogen Generator includes the following function Indications:

- Bypass Alarm - Nitrogen generator is in the "By-Pass" mode (Flashing Indicator)
- Leak Monitoring - Nitrogen generator running excessively (Audible Signal)

The ECS Nitrogen Generator includes the following monitoring outputs:

- System Power (Digital Output)
- Bypass Mode Alarm (Digital Output)
- Nitrogen Generation Mode (Digital Output)
- Nitrogen Supply Line Pressure (Analog Output)
- Leak Monitoring (Digital Output)

The ECS Nitrogen Generator is designed to be used in conjunction with the following components as part of the complete ECS Dry Pipe Nitrogen Inerting (DPNI) system:

- Air maintenance device with on board adjustable regulator (recommend Victaulic Series 757, Tyco Model AMD-1 or Reliable Model A-2)
- Riser-mounted ECS Protector Manual Vent (PAV-D) or ECS Protector Dry SMART Vent (PSV-D)

The ECS Nitrogen Generator can be used with the following optional equipment:

- ECS Protector SMART Gas Analyzer (SGA-1) - one per nitrogen generator is recommended
- ECS In-Line Corrosion Detector (ILD-X) - monitoring at least one system is recommended

Operating Performance

Model Number	Min. Supply Air SCFM (L/min)	Total System Capacity Gallons (Liters)	Single System Capacity† @ 40 psig (2.4 bar) Gallons (Liters)	Single System Capacity† @ 20 psig (1.4 bar) Gallons (Liters)
PGEN-30/(30E)	14.3 (405)	6,500 (24,605)	1,150 (4,353)	2,300 (8,706)

† Capacity based on NFPA-13 30-minute fill requirement of largest single system

Nitrogen Quality

N_2 Purity at Discharge:	98% or greater (Maximum of 2.0% oxygen)
N_2 Pressure at Discharge:	Min of 15 psig (1 bar) Max of feed air pressure minus 15 psig (1 bar)
N_2 Water Dew Point:	Typically less than -70ºF (- 57ºC)

Note: When connecting an ECS Protector Nitrogen Generator to an existing dry pipe/preaction fire sprinkler system, the existing fire sprinkler system(s) must be limited to a maximum leak rate of less than 3 psig within a 24 hour period, per system.

Installation Instructions

Installation of the ECS Protector Nitrogen Generator requires five (5) steps:

1. Mount the cabinet in the appropriate installation location
2. Bring the dedicated power supply to the cabinet
3. Plumb the nitrogen/air supply line to the water based fire sprinkler risers being served
4. Plumb the condensate drain line to floor drain or building exterior
5. Connect Nitrogen generator output signals to BMS or fire alarm system, where applicable

Step 1: Mounting the nitrogen generator cabinet

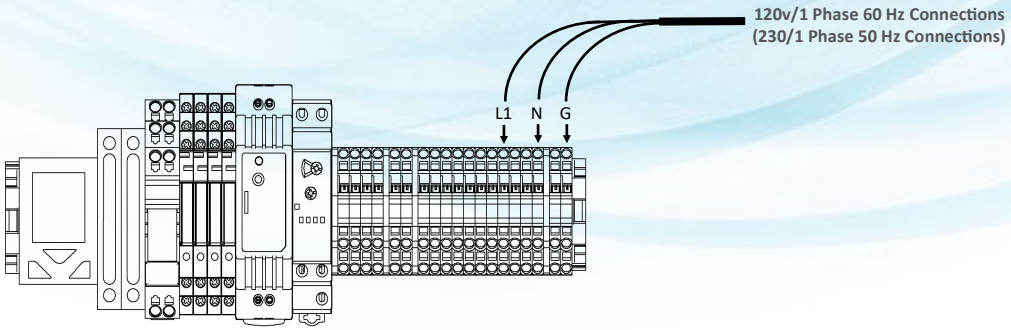
The ECS Protector Nitrogen Generator is designed to be mounted directly to the floor and/or the wall at the installation location. Several factors should be considered in choosing the proper mounting location for the nitrogen generator:

- Access to required power supply (dedicated circuit)
- Access to sprinkler risers being supplied from nitrogen generator
- Access to drain for the condensate discharge line

Note: The cabinet includes pre-punched holes in the feet for floor mounting and holes in the back panel for wall mounting using standard anchors.

STEP 2: Power Supply

The ECS Protector Nitrogen Generator requires a dedicated power supply to prevent interruption from other equipment. The incoming power supply line ties into the top of the terminal blocks inside the nitrogen generator cabinet (see diagram). The landing points are labeled L1, N, and G.



Step 3: Plumb the Nitrogen/Air Supply Line

The nitrogen/air discharge plumbing from the ECS Protector Nitrogen Generator is to be connected directly to the sprinkler system valve trim using ½" to 1" black steel, galvanized steel, or copper lines. The size of the nitrogen/air supply line shall be based on both the length of pipe between the nitrogen generator and fire sprinkler systems and the total volume of fire sprinkler systems being supplied. The nitrogen generator requires an in-line Air Maintenance Device (AMD) that is equipped with an on board field adjustable pressure regulator for each zone being served. The preferred AMD is the Victaulic Series 757.

Note: When both dry pipe and preaction fire sprinkler systems are connected to one nitrogen generator, additional equipment may be required if the fire sprinkler systems operate at different supervisory gas pressures.

Step 4: **Plumb the Condensate Drain Line**

The ECS Protector Nitrogen Generator will occasionally discharge a small amount of condensate water from the coalescing filters inside the cabinet. It is recommended that the ¼" drain connection be plumbed to a floor drain or building exterior. When plumbing to a drain is not feasible an evaporative collection chamber can be used.

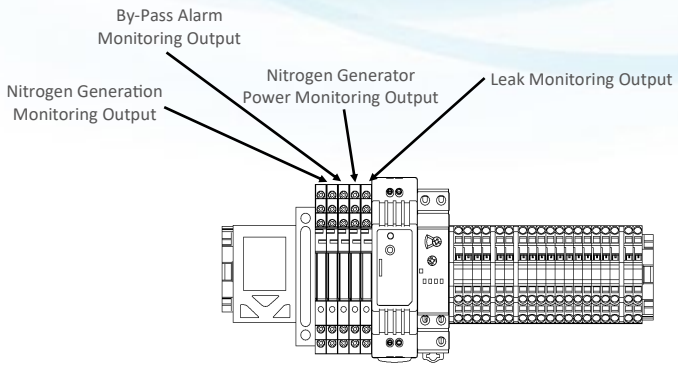
Step 5: **System Signals and Monitoring, where used**

The nitrogen generator cabinet has two (2) system signals and five (5) outputs that can be monitored by the facility's BMS or fire alarm system.

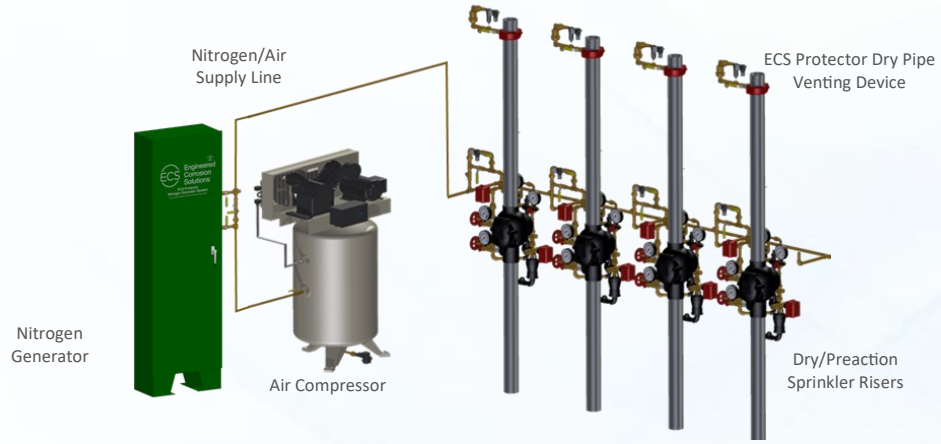
- The nitrogen generator is operating in the bypass mode which is activated when the bypass valve is in the "fast fill" position to fast fill the fire sprinkler system and the air supplied directly from the air compressor has reached a pressure of 20 psig (1.4 bar). (Flashing amber light)
- The nitrogen generator is equipped with a leak monitor audible signal which is activated when the nitrogen generator runs excessively. (Audible signal)

The nitrogen generator cabinet includes system monitoring signals which can be monitored through a building monitoring system, if desired:

- Nitrogen Generator Loss of Power (Form C contacts)
- Bypass Mode Alarm (Form C contacts)
- Nitrogen Generation Mode (Form C contacts)
- Nitrogen System Supply Line Pressure (Analog Signal)
- Leak Monitoring (Form C contacts)



Typical ECS Protector Nitrogen Generator Dry/Preaction System Schematic



Maintenance of the ECS Protector Nitrogen Generator

The nitrogen cabinet contains three (3) separate cartridge filters. **It is recommended that each filter be replaced as part of an annual preventative maintenance program.** In some environments it may be necessary to replace filters more frequently. The filter kit for the PGEN-30 (PGEN-30E) is part number PGEN-FKS. When maintained properly the nitrogen separation membrane will provide up to 20 years of service life.

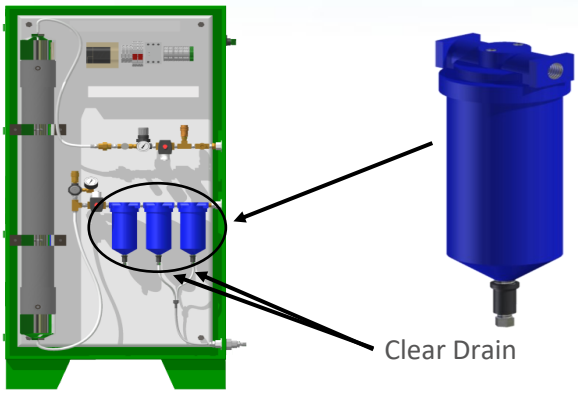
Filter Replacement Procedure

Preliminary Steps (taking the nitrogen generator out of service)

1. Turn the power supply to the unit off
2. Close the inlet and outlet ball valves on the bypass loop
3. Depressurize the nitrogen generator internal inlet piping by slowly unscrewing the petcock valve on the bottom of the leftmost filter housing

Coalescing Filter Cartridge Replacement Procedure

The filters with condensate drain tube extending from the bottom of the filter housing are coalescing filters. To replace the filter cartridges follow Steps 1 through 6 on the following page.

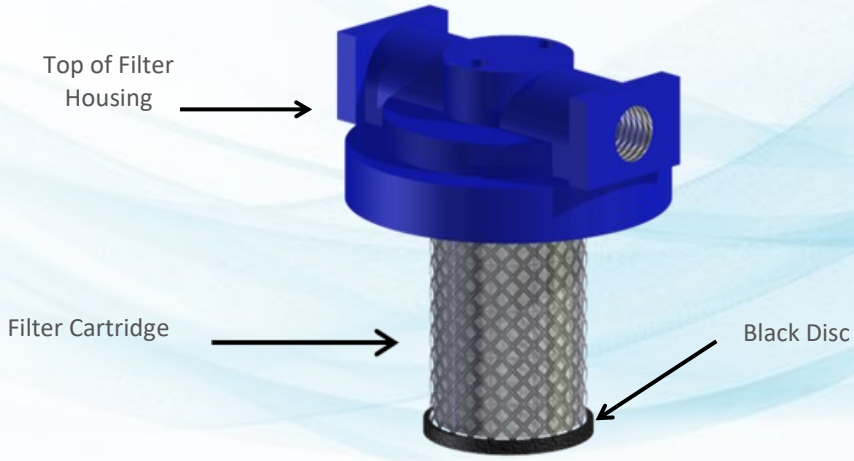


Step 1: Grasp the ¼" clear drain tube on the bottom of the filter housing with the right hand. With the left hand, push upward on the grey retaining ring on the filter housing outlet fitting. This will allow for the ¼" clear drain tube to be removed from the fitting.

Step 2: Once the ¼" clear drain tube has been disconnected, the filter housing bowl may be unscrewed from the top portion of the filter housing which is connected to the internal system piping.

Step 3: Once the filter housing bowl has been unscrewed, the filter cartridge inside is removed by first unscrewing the black retaining disc at the base of the cartridge and then pulling down on the cartridge. Discard the old filter cartridge and replace it with the appropriately marked filter cartridge from the filter replacement kit by pushing up so that it fits snugly onto the receiving cylinder in the upper part of the filter housing. Screw the black retaining disc back onto the central metal threaded rod.

Important: HAND TIGHTEN ONLY!



Step 4: Replace the filter housing bowl by screwing it onto the filter housing top.

Important: HAND TIGHTEN ONLY!

Step 5: Reconnect the ¼" clear drain tube into the fitting on the filter housing bowl. Make sure that it fully seats in the fitting and is retained snugly.

Step 6: Repeat Step 1 through Step 5 for each additional filter.

Activated Carbon Filter Replacement Procedure

The filter without condensate drain tube extending from the bottom of the filter housing is an activated carbon filter. To replace the filter cartridge follow the steps below:

Step 7: Remove the filter housing bowl by unscrewing it from the top portion of the filter housing which is connected to the internal system piping.

Step 8: Once the filter housing bowl has been removed, the filter cartridge inside is removed by first unscrewing the black retaining disc at the base of the cartridge and then pulling down on the cartridge. Discard the old filter cartridge and replace it with the appropriately marked filter cartridge from the maintenance kit by pushing up so that it fits snugly onto the receiving stepped cylinder in the upper part of the filter housing. Screw the black retaining disc back onto the central metal threaded rod.

Important: HAND TIGHTEN ONLY!

Step 9: Replace the filter housing bowl by screwing it onto the filter housing top.

Important: HAND TIGHTEN ONLY!

Step 10: Tighten the petcock valve to the closed position.

Step 11: The ECS Protector Nitrogen Generator can now be placed back into service.

Return the ECS Protector Nitrogen Generator to Service

1. Turn the power supply to the unit on.
2. Open the inlet and outlet ball valves, and close the bypass valve on the bypass loop.
3. Check inside the nitrogen generator cabinet for leaks using a soap water solution. Tighten fittings where needed.

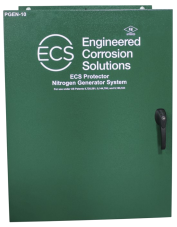
ECS Protector Nitrogen Generator Optional Monitoring Equipment

- **ECS Protector Handheld Gas Analyzer (PHGA-1)**: portable handheld gas analyzer includes one-button calibration and enables user to measure nitrogen concentration at nitrogen generator cabinet or gas sampling ports on ECS venting devices
- **ECS Protector SMART Gas Analyzer (SGA-1/1E)**: permanently installed near an ECS Protector Manual/ SMART Vent to continuously report nitrogen gas concentration to a building information or management system; includes digital display and provides 0-5V DC or 4-20mA output signals
- **ECS In-Line Corrosion Detector (ILD-X)**: installed in-line within the fire sprinkler system piping at locations most susceptible to corrosion; provides either a local push-button test/indicator or control panel monitoring

OUR PRODUCTS. YOUR SYSTEMS

Solutions for every environment

DRY PIPE SYSTEM NITROGEN GENERATORS



Corrosion control technology located in the riser room

	Wall Mount			Skid Mount	Stand Alone w/Separate Air Compressor			
	PGEN-3	PGEN-5	PGEN-10	PGEN-20	PGEN-30	PGEN-40	PGEN-50	PGEN-60
Total System Capacity	675 gal	950 gal	2,000 gal	3,200 gal	6,500 gal	11,000 gal	18,500 gal	22,500 gal
Single System Capacity @ 40 psi(1)	215 gal	265 gal	560 gal	950 gal	1,150 gal	1,440 gal	2,025 gal	2,900 gal
Single System Capacity @ 20 psi(1)	540 gal	590 gal	1,120 gal	1,800 gal	2,300 gal	2,880 gal	4,050 gal	5,800 gal
Air Compressor	Integral	Integral	Integral	Integral	Separate	Separate	Separate	Separate
Size (H x W x D)	36x24x9	36x24x9	38x29x11	57x32x40	53x24x9(2)	76x24x12(2)	76x24x12(2)	76x24x12(2)
Weight	115 lbs	125 lbs	175 lbs	420 lbs	152 lbs(2)	264 lbs(2)	300 lbs(2)	300 lbs(2)

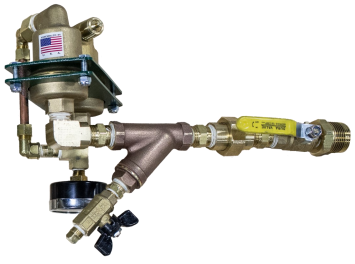
Notes

(1) Single system capacity based on 30 min. fill requirement of largest single sprinkler system; a secondary air compressor with normally closed isolation valve can be used to meet fill requirement for larger individual systems

(2) Size and weight of nitrogen generator only, does not include separate air compressor

(3) All nitrogen generators include 1 year manufacturer's warranty per ECS terms and conditions

WET PIPE SYSTEMS

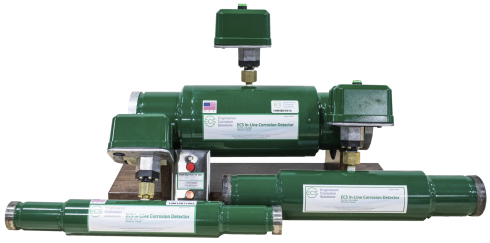


Automatic air venting and nitrogen corrosion control

SERVICES

Corrosion assessments, pipe analysis, and long term corrosion control programs to mitigate future risk

MONITORING SOLUTIONS



Ensure effective corrosion control with real time corrosion monitoring solutions