



## Features

ECS AdvancedIQ Nitrogen Generator (U.S. Patents 8,720,591, 9,144,700 and 9,186,533)

- Interactive LCD touchscreen display
- Bypass alarm indication with sleep mode
- Programmable audible alarm
- Optional remote monitoring and email alerts

Up to 11,000 gallons of total sprinkler system capacity

Easy installation and setup

No nitrogen storage tank



## General Description

The ECS AdvancedIQ Stand Alone Nitrogen Generator is designed to facilitate the Dry Pipe Nitrogen Inerting (DPNI) process for controlling oxygen corrosion in dry pipe and preaction fire sprinkler systems. The nitrogen generator utilizes membrane separation technology that produces 98%+ nitrogen gas. The nitrogen generator can be used in cold storage/freezer applications due to the added benefit of ice plug mitigation. Cold storage application requirements vary based on the temperature of refrigerated space, contact ECS for design assistance.

The AdvancedIQ HMI display screen allows for easy operation and complete control of the nitrogen generator as well as the ability to communicate with the nitrogen generator from anywhere in the world. Access to nitrogen generator operation, maintenance, diagnostics and stored historical data is easily obtained through the HMI screen on the nitrogen generator or remotely through the internet.

The nitrogen generator supplies single or multiple sprinkler systems depending on the number of systems, the volume of the largest system, and the cumulative volume of all systems being supplied. The generator includes an external bypass valve for maintenance or “fast fill” needs to meet the NFPA 13 30-minute fill requirement.

The nitrogen generator is designed to inert the supervised sprinkler systems within 14 days and then automatically provide nitrogen gas for pressure maintenance. When paired with either the Standard Vent (PAV-D/DQ) or the SMART Vent (PSV-D/DE) installed on the sprinkler riser, the nitrogen generator facilitates our patented “fill and purge” breathing process to remove all the corrosive oxygen gas in the sprinkler systems without the need for a nitrogen storage tank.

## Maintenance

Nitrogen generators require limited maintenance; however, it is advisable to routinely check the generator to ensure functionality. Improper maintenance can potentially damage/shorten the service life of the nitrogen generator and/or air compressor. See owner’s manual for required maintenance procedures.

## Specifications

|  |                                  |
|--|----------------------------------|
| <b>Cabinet Dimensions</b>                            | 24.5" (W) x 52.5" (H) x 8.5" (D) |
| <b>Weight</b>  | 152 Lbs                          |
| <b>Power Supply Available In (dedicated circuit)</b> | 120-240VAC/1 phase/50-60Hz       |
| <b>Power Consumption</b>                             | 1 Amp (cabinet only)             |
| <b>Nitrogen/Air Connection</b>                       | ½" NPT Female                    |
| <b>Drain Connection</b>                              | ¼" NPT Female                    |
| <b>Temperature Range</b>                             | 40°F - 105°F (5°C - 40°C)        |
| <b>Replacement Filters</b>                           | FKSA-FS (annual maintenance)     |

## Operating Performance

| Model Number  | AG-6500           | AG-11000           |
|---|-------------------|--------------------|
| <b>Total System Capacity Gallons (Liters)</b>                       | 6,500<br>(24,605) | 11,000<br>(41,640) |
| <b>Single System Capacity† @ 40 psig (2.8 bar) Gallons (Liters)</b> | 1,150<br>(4,353)  | 1,440<br>(5,541)   |
| <b>Single System Capacity† @ 20 psig (1.4 bar) Gallons (Liters)</b> | 2,300<br>(8,706)  | 2,880<br>(10,902)  |

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

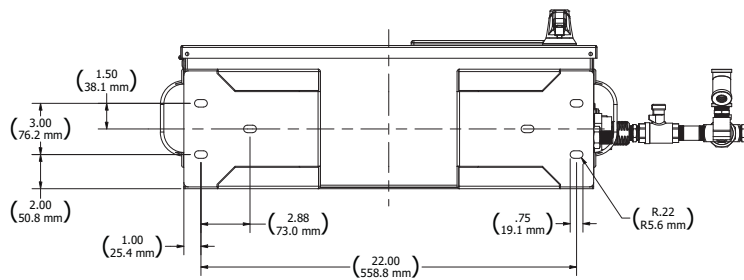
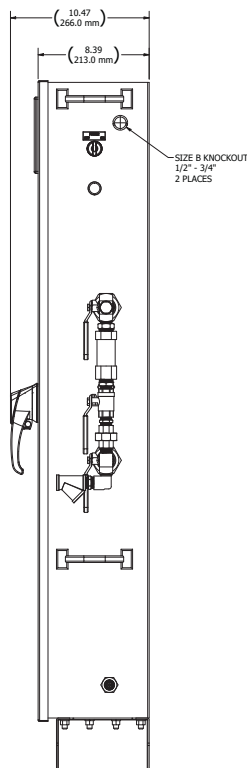
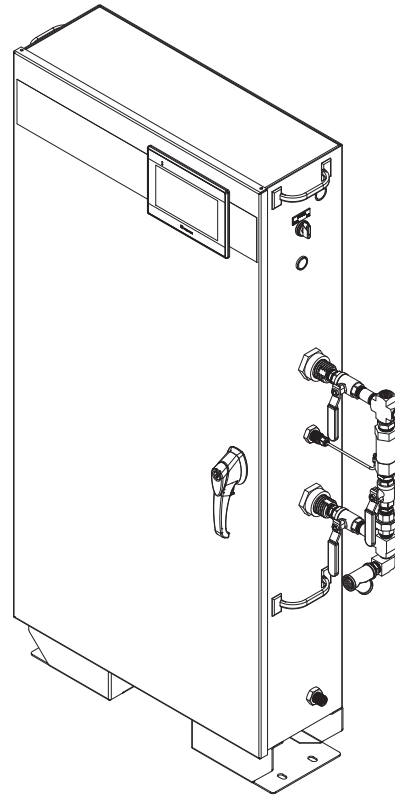
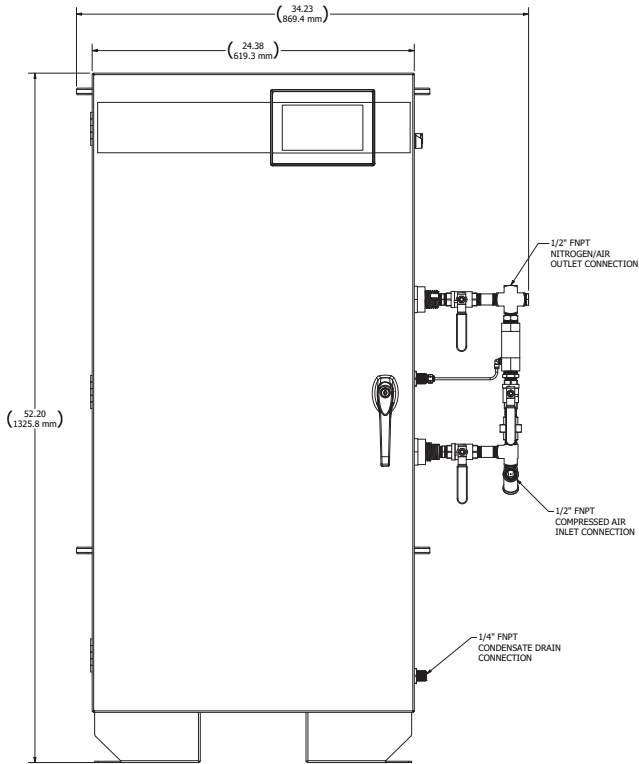
## Installation

The ECS Nitrogen Generator is designed to be mounted directly to the floor and/or to the wall at the installation location. Allow access to the front of the cabinet for service and place the unit in a location that is located near fire sprinkler system connections, a drain, and a dedicated electrical connection. Allow for clearance around vents on side and bottom for proper cabinet ventilation. For detailed installation and operation please refer to the ECS AdvancedIQ Nitrogen Generator Manual.

# AG-6500/11000

ECS AdvancedIQ Nitrogen Generator

## Cabinet Dimensions



# COMP-5/7.5/10

ECS Air Compressor



## Features

Aftercooler included (COMP-7.5/10 only)

Low Oil Level Sensor - Automatically shuts down compressor (COMP-7.5/10 only)

½" NPT Female Outlet (COMP-5/7.5/10)

1" NPT Female Outlet (COMP-10)

Automatic condensate drain – ¼" NPT Female

## General Description

The ECS Air Compressors are paired with the ECS Protector Nitrogen Generators in facilitating the **Dry Pipe Nitrogen Inerting (DPNI)** process in dry pipe and preaction fire sprinkler systems. COMP-7.5/10 when paired with the AG-18500/22500 nitrogen generators can be used as a plant nitrogen source in facilitating the **Wet Pipe Nitrogen Inerting (WPNI)** process in wet pipe sprinkler systems.

## Specifications

|  |   |
|--|---|
| <b>Cabinet Dimensions</b><br>COMP-5<br>COMP-7.5<br>COMP-10 | 32" (L) x 20" (W) x 70" (H)<br>38.1" (L) x 23.6" (W) x 70.1" (H)<br>30" (L) x 43.2" (W) x 76.6" (H) |
| <b>Weight</b>  | COMP-5 (435 Lbs), COMP-7.5 (573 Lbs),<br>COMP-10 (800 Lbs)  |
| <b>Power Supply Compressor</b>                             | 480VAC/3 phase/60Hz (Standard)<br>208VAC/3 phase/60Hz (Optional)                                    |
| <b>Power Supply Auto Drain</b>                             | 120VAC/1 phase/60Hz (can be connected to the nitrogen generator cabinet power supply)               |
| <b>Air Connection</b>                                      | COMP-5/7.5 (½" NPT Female)<br>COMP-10 (1" NPT Female)   |
| <b>Drain Connection</b>                                    | ¼" NPT Female   |
| <b>Temperature Range</b>                                   | 40°F - 105°F (5°C - 40°C)   |

## Maintenance

Refer to Manufacturer's recommended maintenance in Ingersoll Rand owner's manual

## Operating Performance

| Model Number  | COMP-5           | COMP-7.5          | COMP-10           |
|---|------------------|-------------------|-------------------|
| <b>Air Supply SCFM (L/min)</b>                                      | 14.3<br>(405)    | 24<br>(680)       | 35<br>(992)       |
| <b>Single System Capacity† @ 40 psig (2.8 bar) Gallons (Liters)</b> | 1,150<br>(4,353) | 2,025<br>(7,665)  | 2,900<br>(10,978) |
| <b>Single System Capacity† @ 20 psig (1.4 bar) Gallons (Liters)</b> | 2,300<br>(8,706) | 4,050<br>(15,331) | 5,800<br>(21,955) |

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

## Power Requirements

| Model Number          | COMP-5    | COMP-7.5  | COMP-10   |
|-----------------------|-----------|-----------|-----------|
| <b>208VAC/3 Phase</b> | 17.5 Amps | 25.3 Amps | 32.2 Amps |
| <b>480VAC/3 Phase</b> | 7.6 Amps  | 11 Amps   | 14 Amps   |

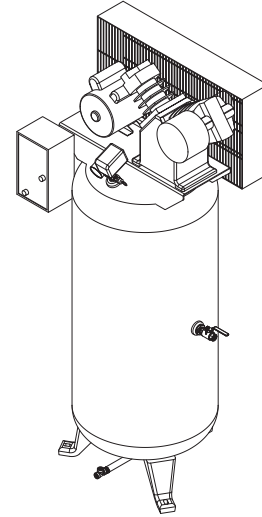
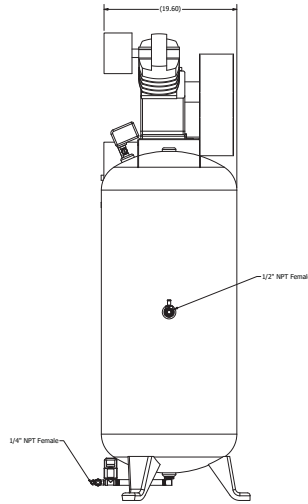
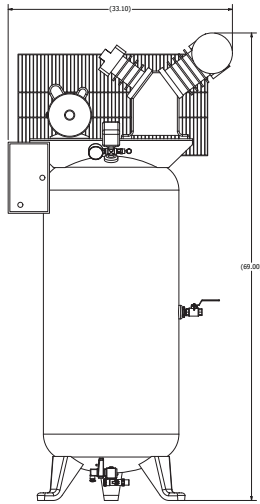
## Installation

The air compressors are designed to be mounted directly to the floor in the fire sprinkler riser room. Vibration pads (supplied) must be installed under the feet of the air compressor to ensure warranty of the air compressor. Allow access to the power supply (one (1) dedicated circuit), access to the nitrogen generator inlet ½" supply line and access to a drain for the condensate discharge line. Allow for clearance to access air compressor for servicing. For detailed installation and operation please refer to the ECS AdvancedIQ Nitrogen Generator Manual.

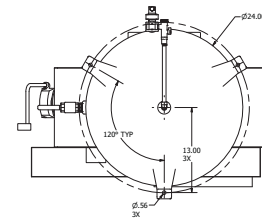
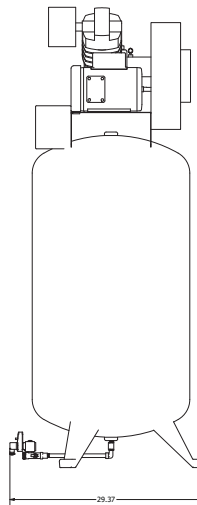
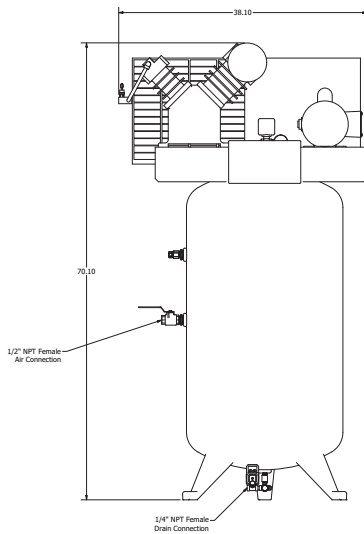
# COMP-5/7.5/10

ECS Air Compressor

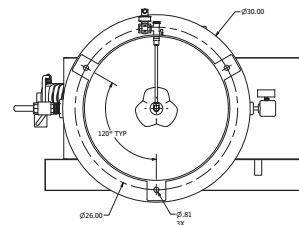
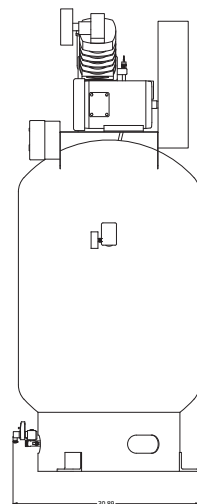
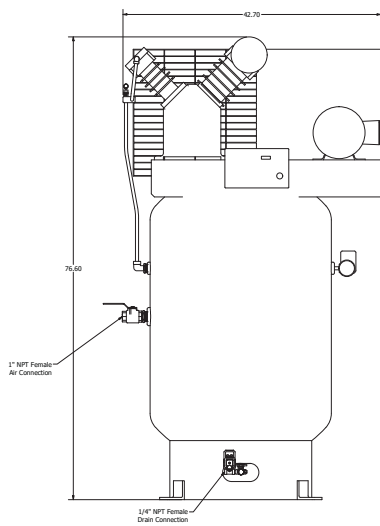
## COMP-5

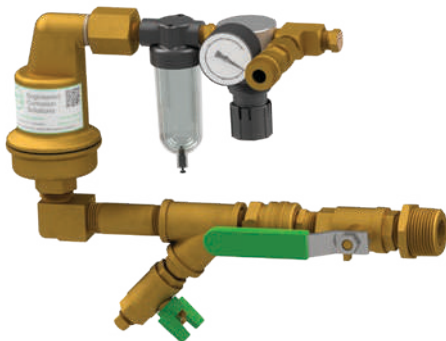


## COMP-7.5



## COMP-10





For use under U.S. Patents  
8,720,591, 9,144,700, 9,186,533  
and 9,610,466

## Specifications

|                           |   |
|---------------------------|---|
| <b>Stock Number:</b>      | PAV-D<br>PAV-DQ   |
| <b>Service Pressure:</b>  | Up to 175 PSIG (12 Bar)   |
| <b>System Connection:</b> | 1" NPT Male   |
| <b>Temperature Range:</b> | 40°F - 125°F (4.5°C - 51°C)   |
| <b>Dimensions:</b>        | 13.5" (W) x 7.5" (H) x 4.25" (D)<br>343mm (W) x 191mm (H) x 108mm (D) |
| <b>Weight:</b>            | 7 Lbs. (3.1 Kg)   |

## General Description

The ECS Protector Vent (PAV-D/DQ) provides oxygen venting in dry pipe fire sprinkler systems. As a fire sprinkler system is filled with a continuous supply of nitrogen gas from the ECS Protector Nitrogen Generator System, the PAV-D/DQ allows oxygen rich gas to be vented from the fire sprinkler system. Over a short period of time the ECS Protector Vent will almost completely remove oxygen from the fire sprinkler system (<2% oxygen).

The ECS Protector Vent must be installed as shown on the engineering design documents. If a location is not specified install the PAV-D/DQ vent on the fire sprinkler system riser on the system side of the main control valve. The PAV-D vent is also installed to provide source gas when used in conjunction with the ECS Protector SMART Gas Analyzer (SGA-1). The PAV-DQ includes the special 5/32" tubing fitting and is used in conjunction with the ECS AdvancedIQ Vent Controller.

The ECS Protector Vent is equipped with a levered float valve that allows oxygen to discharge but prevents liquid water from leaking through the restricted venting orifice in the event that water enters the fire sprinkler system. A backpressure regulator is also included to prevent total system depressurization from the vent assembly.

The restricted venting orifice allows oxygen to be vented from the fire sprinkler system at a controlled rate to achieve a minimum nitrogen concentration of 98%. A special fitting is provided to receive 5/32" tubing when the vent is used in conjunction with the ECS Protector Permanent Gas Analyzer or the AdvancedIQ Vent Controller.

There are three (3) models of the ECS Protector Oxygen Removal Vent, the PAV-D, the PAV-DQ and the PSV-D (PSV-DE). All three units operate as described above but the PSV-D (PSV-DE) model includes an electronic solenoid valve wired to a control panel that automatically closes the vent once the desired nitrogen concentration has been reached. The control panel is also equipped with an on/off switch and vent button to provide a means to allow the venting process to restart should oxygen be reintroduced into the fire sprinkler system.



PAV-DQ

## Installation Instructions

1. The ECS Protector Vent is equipped with a ball valve to be connected to the fire sprinkler riser. The contractor must install a 1" outlet (welded or mechanical) to connect the vent assembly to the sprinkler system on the system side of the main control valve (see Figure 3). The ball valve must remain in the closed position until the ECS Protector Nitrogen Generator System has been commissioned.
2. Install the vent assembly in a level position. Recommended mounting height is between 5'-10' (2-3m) above the finished floor, but a minimum of 2' (.6m) above the dry pipe/preaction valve.  
**NOTE:** Piping to the vent assembly cannot be installed in a configuration that would trap water and prevent drainage to the sprinkler system; a water trap impedes the ability of the vent assembly to vent oxygen from the fire sprinkler system.
3. Inspection of the vent assembly should be performed after installation and hydrostatic testing of the fire sprinkler system. Inspection should be performed periodically thereafter in accordance with the applicable national codes, NFPA codes and standards and/or the authority having jurisdiction.  
**NOTE:** Inspection must include the condition of the in-line filter and checking for blockage in the "Y" strainer and the restricted venting orifice.

## Operating Instructions

1. Verify the vent assembly has been equipped with a restricted venting orifice downstream of the backpressure regulator.  
**NOTE:** If the vent assembly is not equipped with a restricted venting orifice, one will be provided by ECS during system commissioning. The restricted venting orifice must be installed before proceeding with the steps below.
2. Determine the low air alarm pressure and the turn-on pressure of the nitrogen generator.
3. Choose a pressure setting for the backpressure regulator that is above the low air alarm pressure but below the turn-on pressure of the nitrogen generator.
4. Pull the knob out from the regulator to adjust pressure setting. Turn the knob clockwise to raise the pressure, counter-clockwise to lower the pressure.
5. Close the ball valve and allow device to depressurize through restricted venting orifice to pressure setting. Make adjustment to pressure setting using the knob, then open ball valve to pressurize device and close ball valve again to check pressure setting. Repeat process until desired pressure setting is achieved.  
**NOTE:** This process can only be performed when fire sprinkler system is at normal operating pressure.
6. Push knob back into regulator until it clicks into place.
7. Once the ECS Protector Nitrogen Generator System has been commissioned, open the isolation ball valve on the vent assembly. The ECS Protector Vent is now open and actively venting oxygen from the fire sprinkler system. It should remain open for approximately 14 days or until the system nitrogen concentration reaches 98% or greater. Use an ECS Protector Handheld Gas Analyzer to verify the gas concentration inside the fire sprinkler system.  
**NOTE:** The following steps are for the PAV-D only and do not apply to the PAV-DQ when connected to the AdvancedIQ Vent Controller.
8. The PAV-D should remain open for approximately 14 days or until the system nitrogen concentration reaches 98% or greater. Use an ECS Protector Handheld Gas Analyzer (PHGA-1) to verify the gas concentration inside the fire sprinkler system.
9. Close the isolation ball valve. Failure to close the manual ball valve after 14 days or once fire sprinkler system nitrogen concentration reaches 98% will result in additional oxygen corrosion damage to the system and unnecessary run time of the air compressor and nitrogen generator.
10. If the sprinkler system actuates or another event introduces oxygen to the sprinkler system the manual ball valve must be opened again for a period of 14 days to vent oxygen from the system.

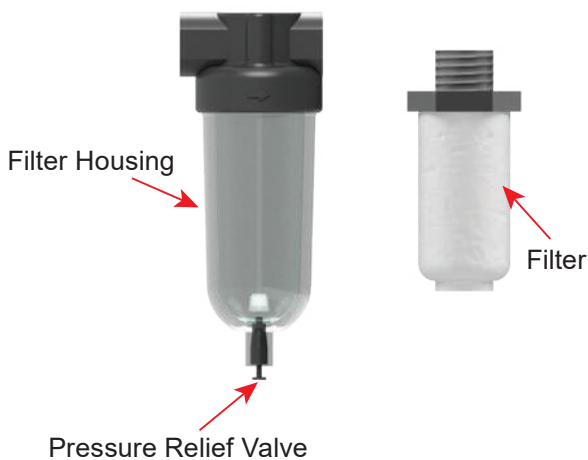
## Maintenance Instructions

1. The ECS Protector Vent must be inspected annually at minimum. While the isolation ball valve is in the open position check for air/water leaks and ensure the pressure gauge is displaying normal system pressure.
2. While isolation ball valve is in closed position inspection must include the condition of the inline filter and for blockage in the “Y” strainer and restricted venting orifice. Twist the filter housing clockwise until it can be removed to expose the filter element.
3. The filter element in the in-line filter should be replaced if a visual inspection reveals a significant collection of debris.

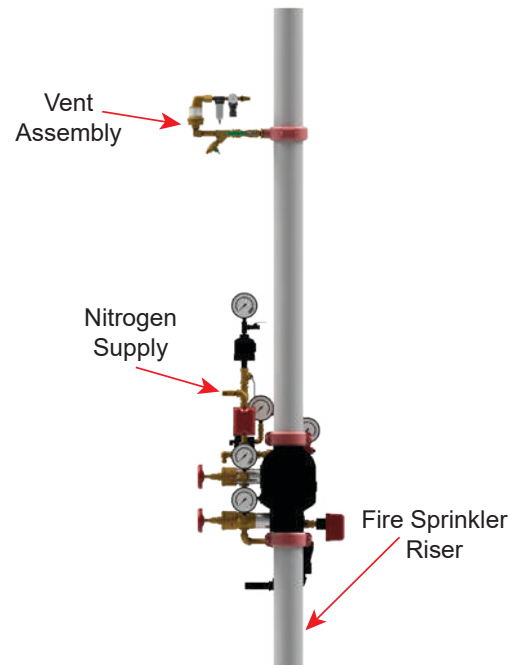
## In-Line Filter Replacement Instructions

1. Close the isolation ball valve.
2. Depressurize the housing by pressing the pressure relief valve on the bottom of the in-line filter housing (see Figure 1).
3. Remove the lower section of the in-line filter housing by turning the filter housing counterclockwise.  
**NOTE:** A rubber o-ring/seal is located between the upper and lower sections of the filter housing.
4. Remove the old filter by turning the filter counterclockwise.
5. Replace with new filter (PV-DRF2-Clear Housing). The filter is secured to the housing by turning the filter clockwise.  
**NOTE:** Ensure the filter is secured only finger/hand tight.
6. Install the rubber o-ring/seal on the lower section of the filter housing.
7. Re-install the filter housing by turning the filter housing clockwise.  
**NOTE:** Ensure the filter housing is secured only finger/hand tight.
8. Open the isolation ball valve.

**FIGURE 1 - In-Line Filter**

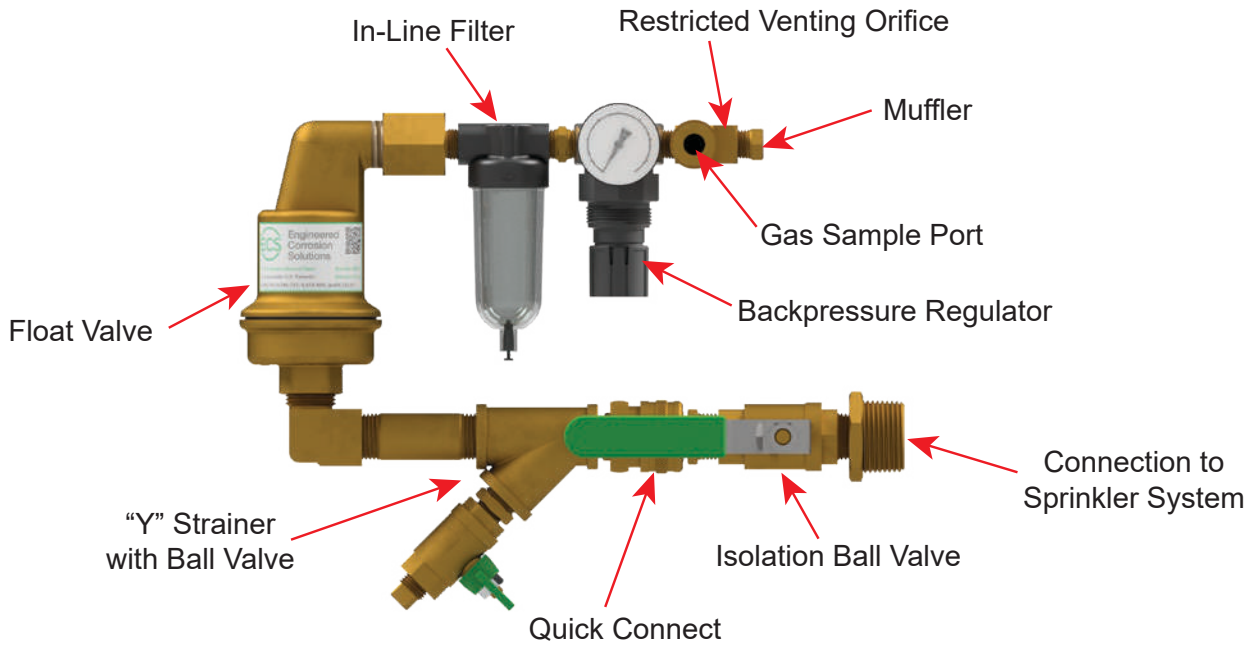


**FIGURE 2 - ECS Protector Vent Installation Schematic**

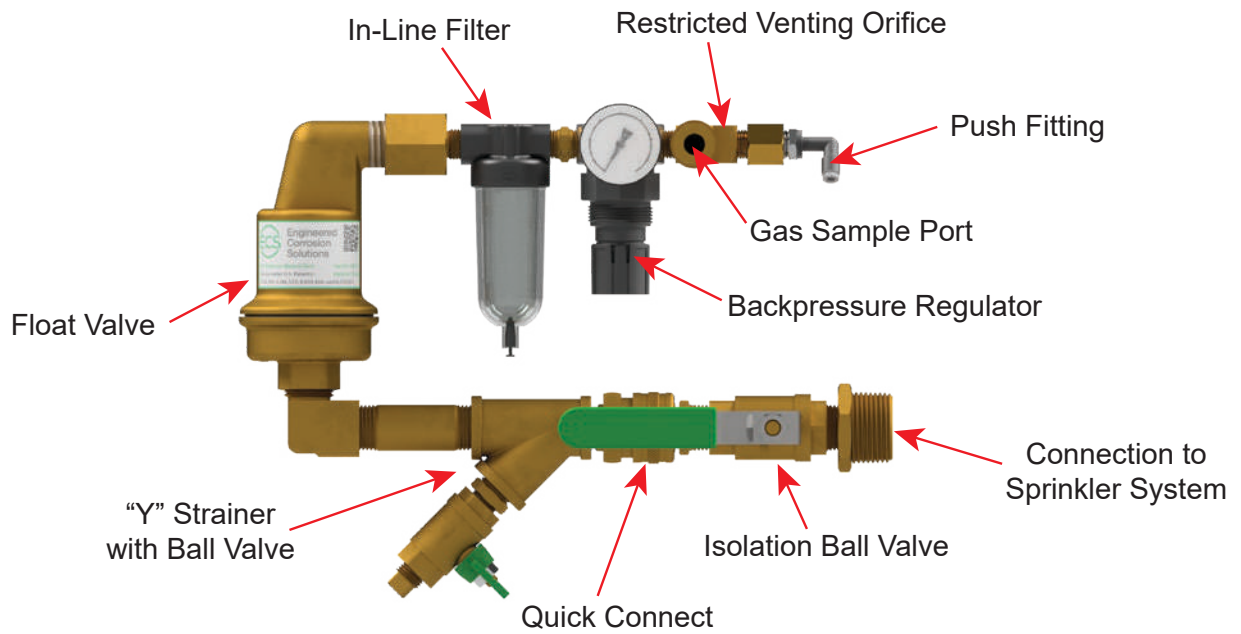


**FIGURE 3 - ECS Protector Vent Components**

**PAV-D**



**PAV-DQ**





# PHGA-1

ECS Protector Handheld Gas Analyzer



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

- One touch calibration
- Small, convenient, and portable
- 24 month warranty
- Compatible with all ECS products

## Specifications

|                               |   |
|-------------------------------|---|
| <b>Sensor Type:</b>           | Galvanic Cell w/ temperature compensation   |
| <b>Measured Range:</b>        | 0.0% to 99.9% nitrogen  |
| <b>Response Time:</b>         | <15 seconds for 90% step change   |
| <b>Accuracy:</b>              | ±1.0% of full scale at constant operating temperature, relative humidity and pressure |
| <b>Temperature:</b>           | Operating: 59°F - 104°F (15°C - 40°C)<br>Storage: 5°F - 122°F (-15°C - 50°C)          |
| <b>Operating Pressure:</b>    | Atmospheric pressure to 3 psig  |
| <b>Sample Connection:</b>     | ECS compatible brass quick connect  |
| <b>Expected Life:</b>         | 2 years   |
| <b>Expected Storage Life:</b> | 2 months; special seal on sensor  |
| <b>Battery Life:</b>          | Approximately 1850 hours  |
| <b>Power:</b>                 | Internal, non-replaceable, Lithium battery  |
| <b>Auto-Off:</b>              | 80 second time-out  |
| <b>Environmental:</b>         | Housing equivalent to NEMA 1; not waterproof  |
| <b>Weight:</b>                | 2.1 oz (60 grams)   |

## Ordering information

**Stock Number:** PHGA-1

## General Description

The ECS Protector Handheld Gas Analyzer (PHGA-1) provides the concentration of nitrogen gas when connected to an ECS product with a gas sample port. The handheld analyzer can be used to verify nitrogen concentration inside a fire sprinkler system or at the outlet of an ECS Nitrogen Generator System. The ECS Protector Handheld Gas Analyzer provides the end user with a simple, cost effective method of gas concentration monitoring.

## Operational Information

Nitrogen purity level in the fire sprinkler system can be checked by inserting the ECS Protector Handheld Gas Analyzer (PHGA-1) into the nitrogen sampling port in the equipment.

1. Power On the PHGA-1 by depressing the power on button.
2. Calibrate the PHGA-1 by depressing and holding the calibration button for three (3) seconds until “CAL” is displayed.

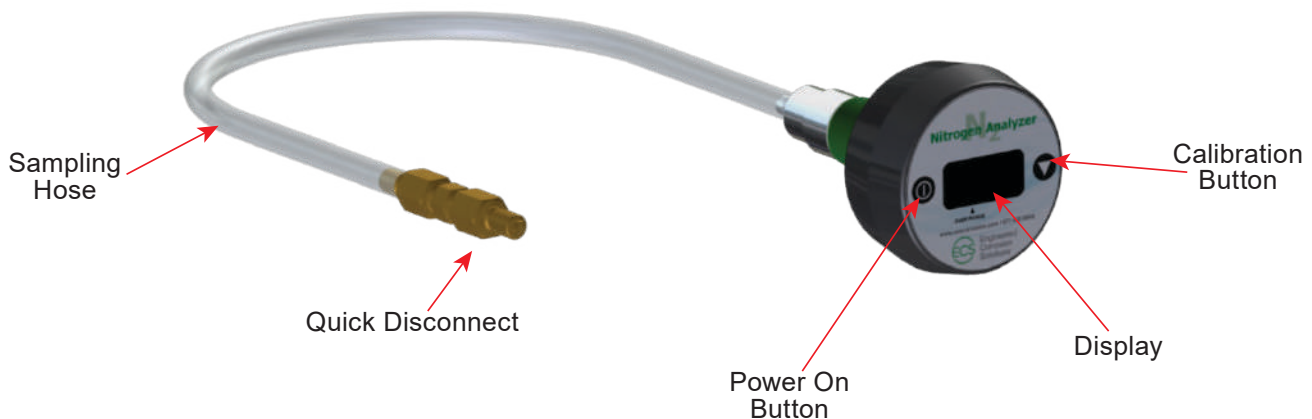
**NOTES:** To calibrate analyzer, unscrew sampling hose from analyzer and move back and forth until reading is displayed.

- a. PHGA-1 must be recalibrated if nitrogen percentage displayed is above 80.1% or below 78.1% when reading normal atmosphere, not connected to the nitrogen generator cabinet/vent.
- b. Recommended to recalibrate analyzer daily when in use.

3. Once the PHGA-1 is calibrated, insert the quick disconnect of the sampling hose into the sampling port in the nitrogen generator cabinet/vent.

**NOTES:** a. Nitrogen generator must be operating in “nitrogen production mode” to sample nitrogen in cabinet.  
b. Vent must be open to sprinkler system pressure to sample nitrogen in sprinkler system.

4. Allow 1 minute for the PHGA-1 to stabilize, verify and document reading on PHGA-1 (nitrogen level should be approximately 98%). If nitrogen level from generator is below 96%, contact ECS.



## Factors Influencing Accurate Readings

1. Elevation changes will affect the accuracy of the nitrogen purity readings. The deviation of the nitrogen purity can be approximately 1% per 250 feet of elevation.
  - a. Calibration of the instrument should be performed when elevation at which the product used changes more than 500 feet above sea level.
2. Temperature effects the accuracy of the nitrogen purity readings. The gas analyzer will hold calibration and correctly read nitrogen purity  $\pm 3\%$  when thermal equilibrium within the operating temperature range. The device must be thermally stable when calibrated and allowed to thermally stabilize after experiencing temperature changes before readings are accurate.
  - a. For best results, perform the calibration procedure at a temperature close to the temperature where analysis will occur.
  - b. Allow adequate time for the sensor to equilibrate to a new ambient temperature.

**CAUTION:** “CAL Err St” may result from a sensor that has not reached thermal equilibrium.