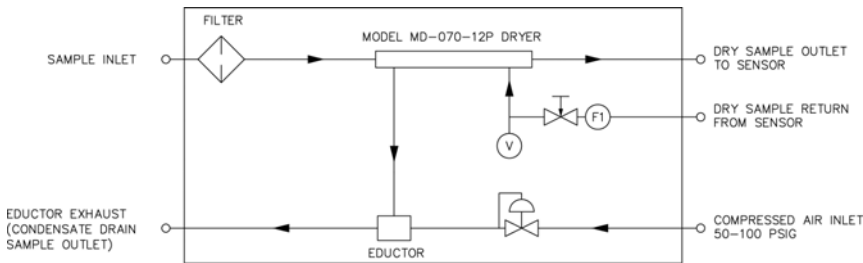


## PRINCIPLE OF OPERATION

The ACES system incorporates a Perma Pure Nafion® membrane dryer, disposable 0.1 micron pre-filter and a vacuum eductor to supply a clean sample to an electrochemical sensor. The dryer is sized to supply a 20-80% RH sample from ambient air at a flowrate up to 2 L/min.

Refer to the flow schematic below. By generating a vacuum, the eductor acts as a pump to draw the sample gas through the system. The sample gas is first pulled through the filter to remove particulate matter. Then it flows through the inside of the Nafion membrane tube within the dryer assembly where excess water is removed. The clean and dry sample gas then exits the system and flows to the gas sensor where the measurement is taken. The sample gas must now flow back to the system to be used as a purge gas for the membrane dryer. Upon re-entering the system it passes through the flowmeter and through a needle valve where it is expanded to the vacuum level of the eductor. The expanded sample gas is then suitable use as purge gas and is passed through the annular area of the dryer assembly and is exhausted to the atmosphere.



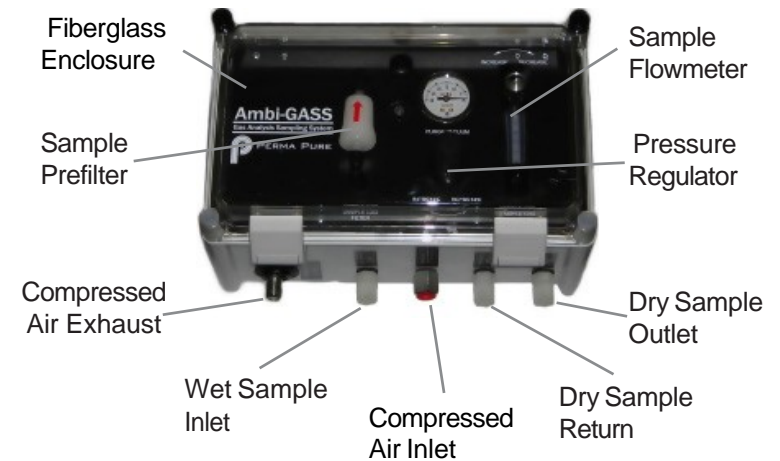
## INSTALLATION

Mount system close as possible to probe and analyzer to reduce response time and flow restriction. Enclosure is NEMA 4X rated and can be installed outdoors. However the unit should be protected from direct exposure to the elements.

1. Mount system to wall using the supplied mounting feet. the flow meter must be in the vertical orientation for proper operation.
2. Connect the fitting labeled "Wet Sample Inlet" to the tube from sample point.
3. Connect the fitting labeled "Dry Sample Outlet" to the tube from the analyzer inlet.
4. Connect the fitting labeled "Dry Sample Return" to the tube from the analyzer exhaust.
5. Connect the fitting labeled "Compressed Air Inlet" to the compressed air supply

## OPERATION

1. Turn compressed air on. Eductor will draw sample through the system.
2. Adjust regulator to 10-15" Hg of vacuum. Higher vacuum will provide dryer sample.
3. Adjust valve on top of flowmeter to set desired sample flow rate. Optimal operating range is 0.5 to 1.5 liters per minute.



## MAINTENANCE

### Filter Replacement:

To determine if filter needs to be replaced, monitor flow rate of sample gas of pump. If output begins to drop, it may indicate a clogged filter element.

1. Note orientation of filter. Flow direction is upward.
2. Push lock ring on black elbow fitting towards body of the fitting. This will retract the internal gripper that holds the filter in the fitting.
3. Pull tube stubs from fitting and repeat for the other end
4. Replace with new filter (part number: AG-DIF-K70).

## SPECIFICATIONS

Description	Specification
Dimensions	12"W x 7"H x 6"D
Air Supply Pressure	Minimum of 60 psig
Air Usage	1.5 - 2.5CFM
Sample Flow	0.1 - 2.0 L/min
Disposable Filter	95% of 0.1 micron
Inlet Humidity Range	0-99%RH
Outlet Humidity	0-80%RH
Piping Connection	1/4" O.D. tube, polypropylene compression fitting
Filter Model	AG-DIF-K70
Dryer Model	MD-110-12F-4

# ACES™

## Ambient Air Sample Conditioning System

### User Manual



**PERMA PURE**

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