

Aadco Hydrogen Generators

History

In the past, all hydrogen generators relied upon a strongly alkaline electrolyte mixed and replenished by the operator as it was expended. In 1959 the solid polymer electrolyte (SPE) was introduced for such electrochemical devices as fuel cells, electrolysis units and oxygen concentrators, all utilizing the same basic SPE and electrode components. In 1974 a hydrogen generator was developed by applying the solid polymer electrolyte technology from the aerospace applications. The SPE is a cation exchange membrane that has the stability and performance requirements for a long-lived electrolysis system and replaces the caustic electrolyte. It is a solid plastic sheet of perfluorinated sulfonic acid polymer producing hydrogen and oxygen by the electrolysis of water. This same polymer is incorporated in all AADCO hydrogen generators.

Installation

Once connection to the proper electrical outlet has been made, the water storage tank filled with deionized water and the deionizer and indicating desiccator installed, the generator is ready for operation. The output can be connected to a single using instrument or "tee'd" to several instruments, provided the total hydrogen consumption does not exceed 225 cc/min at operating pressure. Where higher flows are required, several hydrogen generators can be manifolded.

Models

AADCO hydrogen generators are available in both bench and rack mounted instruments designed to meet the needs of laboratory operations or other small hydrogen requirements. Performance, operation and components are identical for both units.

Operation

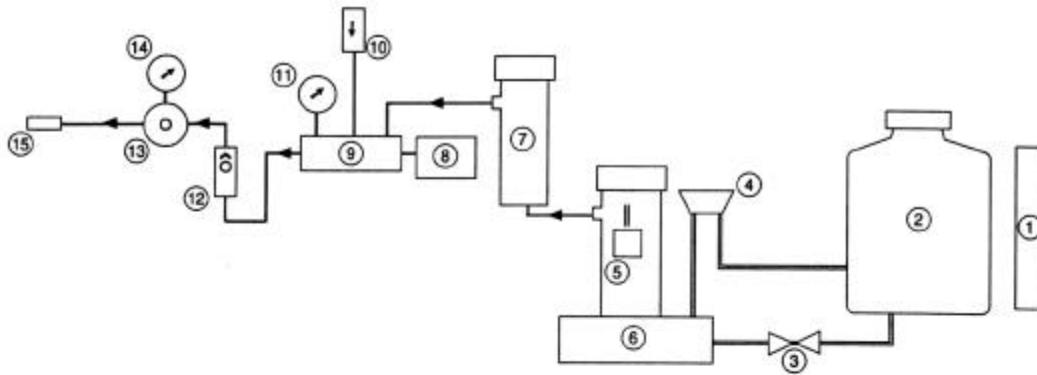
Within ten to eleven minutes upon completion of the installation and applying power to the generator, full internal pressure, as shown on the Internal Pressure gauge, will be reached. The operator then sets the output pressure at any pressure from 2 to 60 psig with the output pressure regulator, monitoring this pressure on the Output Pressure gauge. The flow is then regulated at the using equipment from 1 – 225 cc/min. The performance of the generator during operation is indicated automatically by various diagnostic lamps and pressure gauges. Water consumption is 11 cc/hr at maximum output, allowing 14 days uninterrupted operation. Water can be added at any time without ceasing operation.

Safety

Of major significance are the OSHA regulations governing the siting and usage of high pressure cylinders. The AADCO 1225-series hydrogen generators, with their low interval volume and low pressure, satisfy OSHA requirements and eliminate most problems associated with hydrogen use. Also eliminated are the hazard of stored hydrogen in the laboratory, the tedious and dangerous changeout of cylinders and regulators, and also personnel injuries. The SPE membrane allows use by untrained technicians without the worrisome handling of concentrated caustic solutions.

Purity

The Ultra High Purity (Gold Label) grade of hydrogen supplied by compressed gas manufacturers is equivalent to the hydrogen purity (99.995+%) generated by the AADCO 1225-series of hydrogen generators. This purity exceeds the requirements for most laboratory applications. For those applications that demand extremely pure hydrogen: nickel or ruthenium catalyst systems used in the conversion of CO and CO₂, to CH₄ and subsequent FID detection, TOC analyzers used in micro level water analysis, electrolytic conductivity detectors operated in the reductive mode and microcoulometric systems, it is recommended that an AADCO 560 series hydrogen purifier be incorporated to eliminate the low level gases dissolved in the water supply. These purifiers will deliver hydrogen, under pressure, of such purity as to defy detection of any contaminant by any known analytical technique.



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| 1. Water Level Viewing Window | 9. Manifold |
| 2. Water Tank | 10. Overpressure Relief Valve |
| 3. Water Level Control Valve | 11. Internal Pressure Gauge |
| 4. O ₂ /H ₂ O Water Separator | 12. Ball Float |
| 5. Float Switch | 13. Output Pressure Regulator |
| 6. SPE | 14. Output Pressure Gauge |
| 7. Desiccator | 15. Outlet |
| 8. Electrical Pressure Switch | |

SPECIFICATIONS

Model	1225 (Bench)		1225-R (Rack)	
Capacity	225 cc/min			
Output Pressure	2-60 PSIG		4.0 Bar	
Power	Single Phase, 50/60 Hz, 195 VA		115 VAC or 230 VAC	
Dimensions	11"W x 12"H x 12"D 27.9cm W x 30.5cm H x 30.5cm D		19"W x 14"H x 17"D 48.2cm W x 35.5cm H x 43.2cm D	
Weight	30 lb.	13.6 kg	36 lb.	16.3 kg
Shipping Weight	38 lb.	17.2 kg	44 lb.	19.9 kg
Output Connection	1/8" Swage			