

## ***Air Products and Chemicals, Inc.***

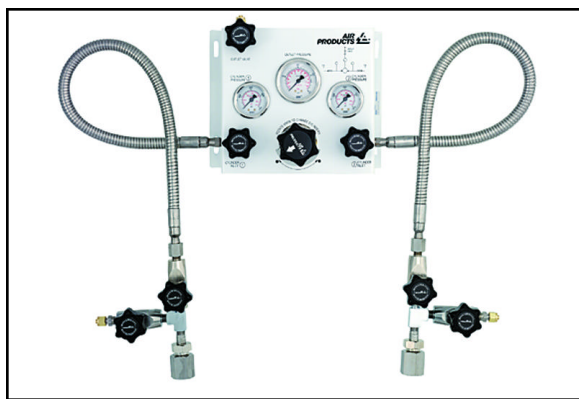
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Air Products and Chemicals, Inc. is an international supplier of industrial gases and related equipment, as well as selected chemicals. With 17,000 employees working at operations in over 30 countries, the company is committed to building lasting commercial relationships based on understanding its customers' businesses. Through this understanding, the company continually finds ways to help customers win in their markets around the world, while maintaining its focus on being an industry leader in health, safety, and preservation of the environment. The company is headquartered in Pennsylvania's Lehigh Valley and has sales to more than 100 countries throughout the world.

Air Products is a recognized leader in supplying gases (including air, argon, carbon dioxide, helium, hydrogen, nitrogen, and oxygen) and related equipment to the analytical industry through its sustained commitment to customer service and by providing the stringent purity, quality, and consistency requirements demanded for analytical applications. Over the past 20 years, the company has invested heavily in organic analytical capabilities, both in hardware and in experienced analytical chemists.

### **Automatic Changeover Panels**



The company's BIP Cylinder Automatic Changeover Panels provide continuous, uninterrupted gas supply on installations in which a reserve cylinder is used, while maintaining the published specifications of the BIP gases. Each unit, consisting of two identical regulators, is purged with heated, purified gas to remove oxygen and moisture. The system is then pressurized and sealed prior to shipping. The two flexible lines connecting the regulator to the cylinders terminate in a BIP tee-purge valve assembly, with check valves to ensure the changeover system remains uncontam-

inated by air when an empty cylinder is replaced.

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### **Gas Purifier**



BIP™ technology (Built-In-Purifier) has been designed to deliver consistent, ultrahigh-purity gas through a hassle-free purifier contained within a compressed gas cylinder. Originally developed for gas chromatography and other specialized applications, each helium or nitrogen cylinder is guaranteed to deliver product containing less than 10 ppb of oxygen and less than 20 ppb of water, while hydrocarbons and halocarbons have been shown to be less than 10 ppt.



While external in-line purifier trains have traditionally been used to protect analytical instrumentation and data from gas contamination, they have been recognized as an incomplete solution for several significant reasons. In-line purifiers require regular maintenance, and if not properly maintained, they can add back to the carrier gas the contaminants they were intended to remove. BIP technology polishes the gas to even higher levels of purity just before it exits the cylinder valve, thereby solving the gas impurity problem. A specially designed valve incorporates features that protect the internal purifier material against inadvertent back-filling and contamination. The purifier bed was designed with excess capacity for the standard impurities of oxygen, moisture, hydrocarbons, halocarbons, and carbon monoxide/carbon dioxide.

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### Helium Cylinder

BIP+ Helium is a BIP cylinder filled with the company's research-grade helium. The purification system improves the purity of the research-grade helium to BIP oxygen and moisture specifications and adds the BIP guarantee of consistency. The helium comes fully analyzed with a corresponding Certificate of Analysis to document that the gas meets the research-grade specifications.

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### Argon Cylinder

Argon is available in the BIP package as a plasma gas for ICP-MS. In addition to the standard BIP oxygen,



water, and halocarbon impurity removal, the filter at the top of the purifier efficiently retains particles  $\geq 0.5$   $\mu\text{m}$  diam, thus eliminating interfering metals from the gas. The gas is targeted for the niche market of university laboratories and intermittent users who cannot or do not want to use dewars.

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### Purification Products

A gas grade, gas product, and a piece of high-purity equipment have been added to the company's BIP product portfolio. The three product offerings—BIP+ Helium, BIP Argon, and BIP Cylinder Automatic Changeover Panels—are also designed to provide higher-quality analyses with less maintenance and less hassle.

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