



High-Capacity UpTime[®] Sub-Atmospheric Delivery System

A safe, cost-effective dopant gas delivery system for ion implanters



Increase productivity with the UpTime[®] delivery system - OEM qualified and production proven

The UpTime[®] sub-atmospheric dopant gas delivery system is designed as an alternative to existing adsorbent-based technology used in ion implanters. Compared to the existing technology, the UpTime system offers industry leading product capacity, higher product purity and a lower cost of ownership.

The UpTime system is comprised of an internal vacuum actuated valve in series with a specially designed internal flow restrictor. The UpTime device is designed for safety, with two different types of safeguards: a mechanical actuator and a flow restrictor.

UpTime Product Family

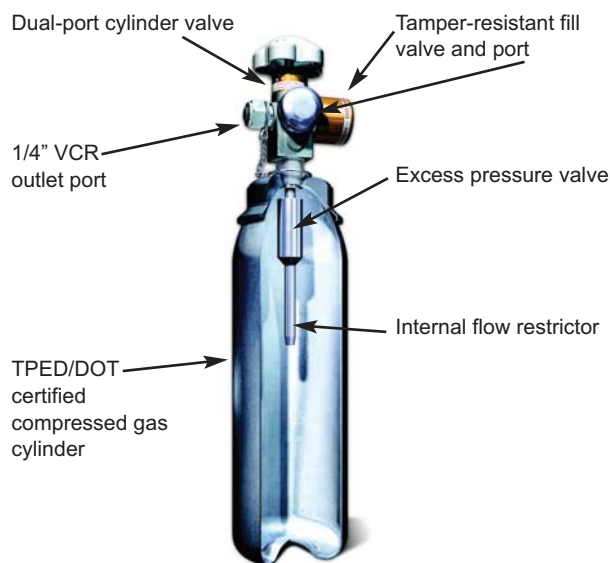
- Enriched $^{72}\text{Germanium Tetrafluoride}$
- Germanium Tetrafluoride
- Silicon Tetrafluoride
- Arsine
- Phosphine
- Isotopically Enriched $^{11}\text{Boron Trifluoride}$.*

US Patent Numbers: 5,937,895; 6,007,609

*Additional ultra-high purity gases are available upon request

Features

- Sub-atmospheric delivery
- Internal flow restrictor limits flow to 20 sccm
- SEMI[®] S2 and S8 compliant
- Highest equivalent-cylinder product capacity
- High product utilization
- Robust safety features
- Ultra-high purity gas



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Enabling next-generation technology

Praxair specializes in developing high performance and cost-effective products to serve next-generation semiconductor manufacturing.

About Praxair

Praxair is dedicated to helping semiconductor manufacturers lower costs, improve productivity, enhance technology and reduce environmental impact by serving as a single, integrated source for a variety of process gases, materials, and related equipment and services.

Praxair's commitment to materials science and gas technology includes:

Process Consumables

- Ultra-high purity semiconductor process gases
- Sputtering targets
- ALD/CVD precursors

Fab Infrastructure and Services

- Bulk and on-site gas production
- Analytical systems and services
- Process gas delivery systems
- Total gas and chemical management services
- Integrated supply chain management services

Isotopically Enriched ¹¹Boron Trifluoride (¹¹BF₃) Specification, 3.0 grade

- Fill pressure 1250 psig
- Internal flow restrictor limits flow to 438 sccm

Component Value (ppm)

Component	Value (ppm)
Boron-11 Isotopic Enrichment	>99.7%
Argon + Oxygen	50
Carbon Dioxide	25
Hydrogen Fluoride	25
Nitrogen	25
Sulfur Dioxide	25

Shelf life: 36 months



Cylinder Specification

Cylinder Size	Overall Height A	Height to Connection B	Cylinder Body Height C	Diameter D	Content Fill Weight
UT-5	18.0" 457mm	15.3" 389mm	13.25" 366mm	4.4" 111mm	1100g
UT-6	22.5" 571mm	19.7" 500mm	17.5" 445mm	6.25" 159mm	3300g

Gas Stick Recommendations

- 1/4" FVCR cylinder connection
- Vacuum required at cylinder connection between 100 and 610 torr
- Low pressure transducer (ideally 0-1000 torr range)
- Vacuum pressure mass flow controller
- Normally closed pneumatic isolation valve suitable for ≥1250 psig service that automatically closes if pressure exceeds working pressure of low-pressure components
- All components not protected by an isolation valve are suitable for ≥1250 psig service

Gas Box Recommendations

- Toxic gas monitoring of the gas box exhaust
- Gas box exhaust interlocked and abated



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