



## UpTime<sup>®</sup> Sub-Atmospheric Delivery System

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



### Increase productivity with the UpTime<sup>®</sup> delivery system - OEM qualified and production proven

The UpTime<sup>®</sup> 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

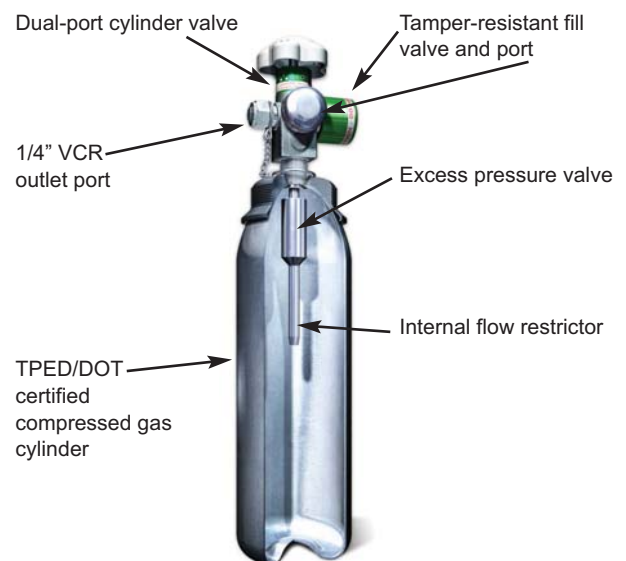
- Enriched  $^{72}\text{Ge}$  Germanium Tetrafluoride
- Germanium Tetrafluoride
- Silicon Tetrafluoride
- Arsine
- Phosphine
- Isotopically Enriched  $^{11}\text{B}$  Boron Trifluoride.\*

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<sup>®</sup> 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

## Enriched <sup>72</sup>Germanium Tetrafluoride (<sup>72</sup>GeF<sub>4</sub>)

### Specification, 4.0 grade

- Liquid vapor pressure 205 psig
- Internal flow restrictor limits flow to 51 sccm

Component	Value (ppm)
Germanium-72	>50% to
Isotopic Enrichment	<52%
Argon + Oxygen	50
Carbon Dioxide	25
Carbon Monoxide	25
Nitrogen	25
Sulfur Dioxide	25
Shelf life: 24 months	

## 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 ≥205 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 ≥205 psig service

## Gas Box Recommendations

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



## Cylinder Specification

Cylinder Size	Overall Height <b>A</b>	Height to Connection <b>B</b>	Cylinder Body Height <b>C</b>	Diameter <b>D</b>	Content Fill Weight
UT-5	18.0" 457mm	15.3" 389mm	13.25" 366mm	4.4" 111mm	150g
UT-5	18.0" 457mm	15.3" 389mm	13.25" 366mm	4.4" 111mm	400g
UT-5	18.0" 457mm	15.3" 389mm	13.25" 366mm	4.4" 111mm	700g



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