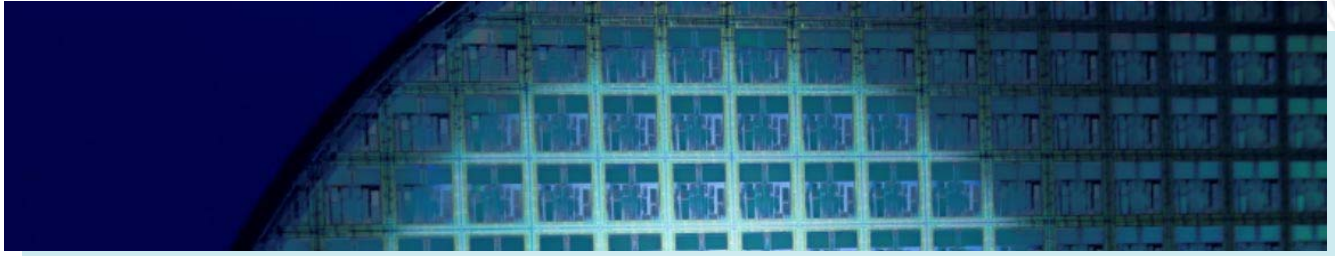


# GASGUARD® VERY HIGH-FLOW SYSTEM (VHF)



THE NEXT GENERATION OF BULK SPECIALTY GAS DELIVERY



Our GASGUARD® gas delivery systems have revolutionized the global electronics industry since their introduction in the late 1990s. We have hundreds of installations worldwide, dedicated to the safe and reliable supply of an array of electronic specialty gases.

Our GASGUARD Very High Flow is our fourth generation bulk delivery gas supply system. It delivers all of the advantage of the first three systems:

- Incorporates Versum Materials' Universal Pigtail functions to allow for a smaller footprint and lower cost of ownership
- The system resides close to the source for easy operation during source changes
- Flexible and easy to install
- Can deliver SiH<sub>4</sub>, NF<sub>3</sub>, NH<sub>3</sub>, N<sub>2</sub>O and HCl
- Easy upgrade to dual modules or higher flow rates

### Key Benefits of the Very High Flow System:

- Reduced cost of ownership
- Replaces multiple gas cabinets reducing installation, ventilation and space requirements
- Improved flow rates
- Lower product costs
- Lower labor costs and reduced cylinder handling
- Bulk systems can be sited indoors or outdoors for most systems

### Improved Safety and Operations:

- Less handling and connections reduces potential exposure to hazardous gases and chemicals
- Reduces fab downtime
- Available in multiple layers of redundancy for best possible fab uptime



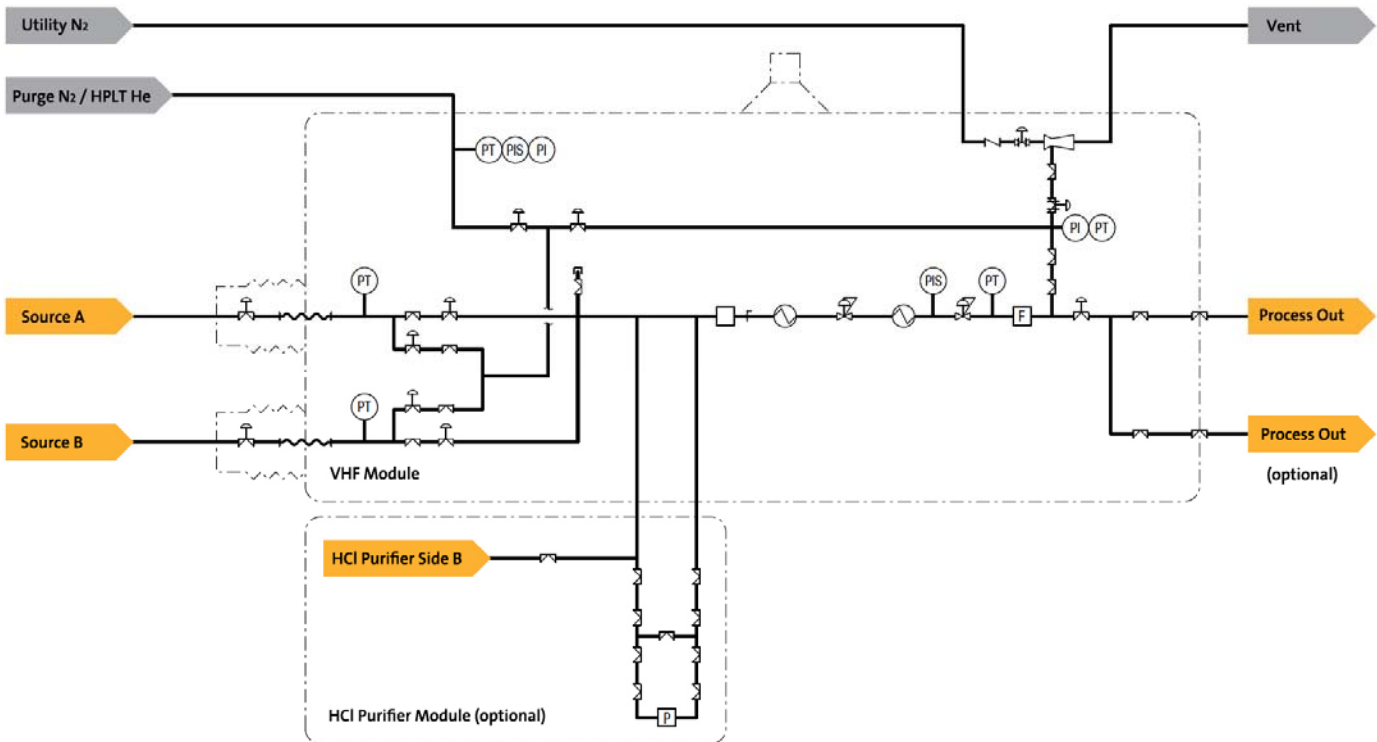
## GASGUARD Very High Flow System Design Overview

- Flows of up to 1600 standard liters per minute (slpm), contingent on options and gas service selected (see chart below)
- Automated purge and leak checks
- Automated vent and vacuum system monitoring
- Adapts to support your fab operations and can be configured to economically accommodate a variety of needs. Available operating configurations include:
  - **Single-source, single VHF:** Standalone VHF module and a single gas source
  - **Dual-source, single VHF:** Standalone VHF module with two gas sources and auto switching
  - **Single-source, dual VHF:** Two VHF modules, each with a single-source container—autoswitching capabilities between modules
  - **Dual-source, dual VHF:** Two VHF modules, each with two gas sources. Both source containers (A and B) can be online simultaneously for higher flow Y applications—autoswitching capabilities between modules

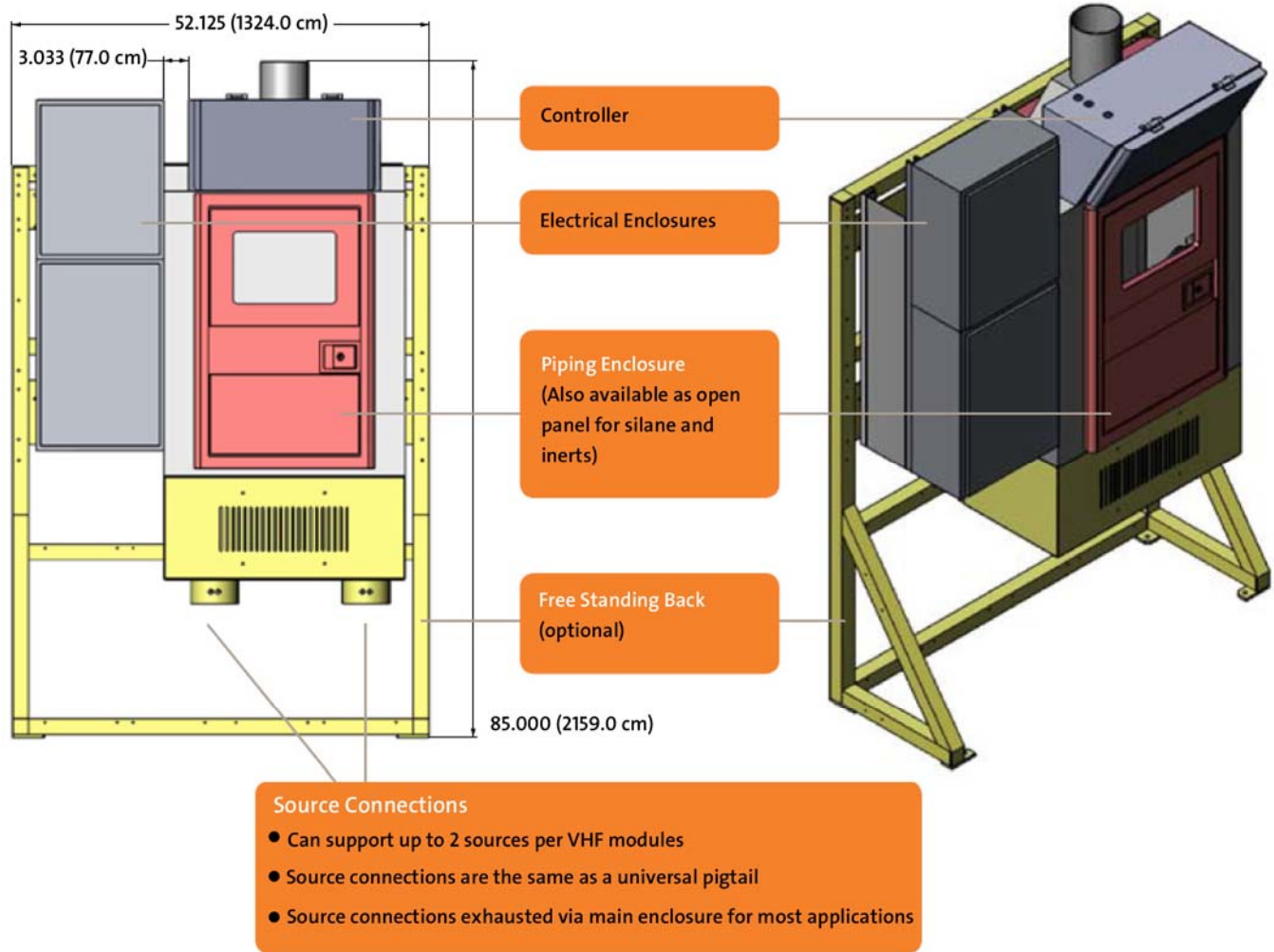
### Gas Flow Rates (slpm)

SiH <sub>4</sub>	N <sub>2</sub> O	NH <sub>3</sub>	NF <sub>3</sub>	HCL
1000	1000	1600	1000	1000

### Basic GASGUARD VHF Module



## GASGUARD VHF Layout



## Available Options

- Sources can include ISOs, tube trailers, drums, cylinder packs, and Y-cylinders
- Source scales and source heaters
- Tube switching is available for improved safety on pyrophoric and toxic gases
- VHF can be built as an enclosed system or rack
- Temperature or flame (UVIR) monitoring
- Single or dual-stage regulation and single or dual-stage JT heating
- Heat tracing for liquefied compressed gas
- Networking via Ethernet communication is available
- Houseline pressure monitor and interstage pressure monitor
- Houseline filtration
- Dual process and purge isolation
- Coaxial tube monitoring for houseline
- Trickle vent valve, limits flow of process gas to abatement system
- Independent, external, high-flow HCl purifier available.

Our GASGUARD Very High Flow systems are equipped with the new GASGUARD AP11 controller— the latest generation of control technology for specialty gas delivery systems. The AP11 provides users with enhanced uptime, simplified troubleshooting, and increased controller reliability.

**The benefits of the AP11 controller include:**

- Uninterrupted gas supply while controller is in service
- Simplified troubleshooting by using smart indicators
- Continued focus on reliability in the design and testing processes (e.g. HALT methodology)
- The Auto Recovery System (ARS) provides a second microprocessor for redundancy and to enhance uptime



For more information, please contact us at:

**VERSUM MATERIALS, INC.**  
**[VERSUMMATERIALS.COM](http://VERSUMMATERIALS.COM)**

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