

# NANOCHEM® A-300I AsH<sub>3</sub> and PH<sub>3</sub> Purifier

## For III-V Compound Semiconductor Epitaxy

### Features and Benefits

- Direct purification for 100% AsH<sub>3</sub> and PH<sub>3</sub> gas used in ultra-high purity applications: point-of-use (most recommended), valve manifold boxes and gas cabinets
- Critical application: GaAs MOCVD - Proven in the field for the manufacture of high brightness LEDs and HBTs using high-purity AsH<sub>3</sub> and PH<sub>3</sub>
- No external power source required
- Easy to install and operate
- Does not require heating or cooling
- Mounting bracket included
- Design uses Inlet / outlet springless diaphragm valves
- Uses new, patented, superactivated inorganic purification media ASX™ and PHX™
- "Drop-In" replacement for competitor's hydride purifiers

### Specifications

- Ultra-high purification of AsH<sub>3</sub> and PH<sub>3</sub>
- ASX™ and PHX™ media performance specifications:
  - < 1 ppb H<sub>2</sub>O in inert gas (APIMS LDL)
  - < 75 ppb H<sub>2</sub>O in AsH<sub>3</sub> (MAH-2 LDL)
  - < 45 ppb H<sub>2</sub>O in PH<sub>3</sub> (FTIR LDL)
  - < 300 ppb CO<sub>2</sub> in inert gas (PHX™, GC-DID LDL)
- Expect to remove oxyacids: H<sub>x</sub>As<sub>y</sub>O<sub>z</sub> & H<sub>x</sub>P<sub>y</sub>O<sub>z</sub>
- 0.003 µm Pall® Teflon PTFE particle filter with 99.9999999% retention
- Recommended flows: up to 15 slpm (0.9 NM<sup>3</sup>/hr)
- Maximum feed AsH<sub>3</sub> /PH<sub>3</sub> pressure – 60 psig (0.51 MPa)
- Maximum operating temperature: 40°C
- Internal surface finish: < 10 µin Ra
- All metal parts: Type 316L stainless steel, Elgiloy® or Nickel 200
- ASX™ and PHX™ media are also available for NANOCHEM® Models L-60 and L-300

LDL Lower Detection Limit by State-of-the-Art Analytical Instrumentation  
APIMS Atmospheric Pressure Ionization Mass Spectrometry  
FTIR Fourier Transform Infrared Spectrometry  
GC-DID Gas Chromatography with Discharge Ionization Detector  
MAH-2 Shimadzu Moisture Analyzer, Model MAH-2



### Overview

NANOCHEM® A-300I series purifiers offer a new, patented breakthrough technology alternative to the purification of 100% AsH<sub>3</sub> and PH<sub>3</sub> used in the III-V Compound Semiconductor Epitaxy Processes, with a "drop-in" replacement design.

Gas contaminants, especially moisture and oxygen-containing species, adversely affect process quality and reduce yields. In AsH<sub>3</sub> and PH<sub>3</sub>, moisture is known to increase with cylinder use. NANOCHEM® A-300I purifiers provide protection from such moisture surges from source AsH<sub>3</sub> and PH<sub>3</sub> gases, and from system upsets, such as leaks in the process line and cylinder changes.

### Connections and Model Numbers

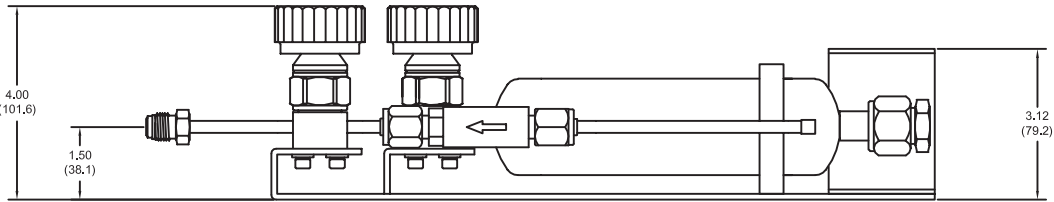
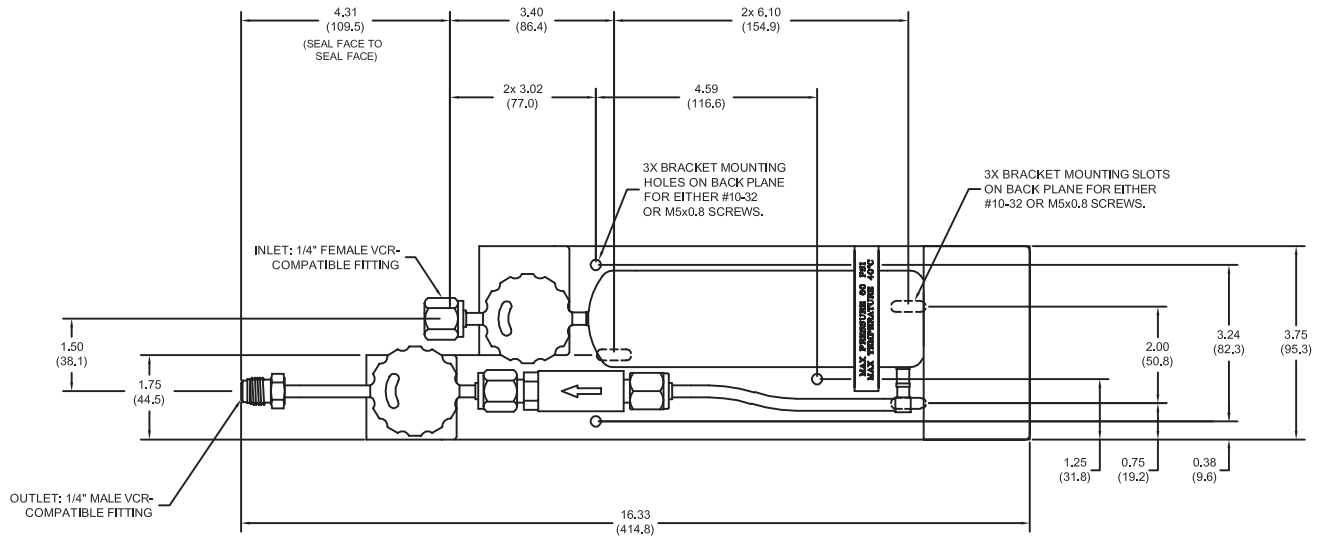
- Female inlet and male outlet are 1/4"VCR®-compatible face seal fittings
- AsH<sub>3</sub> Model: A-300I-ASX™ (Part # S1060-0414-001)
- PH<sub>3</sub> Model: A-300I-PHX™ (Part # S1060-0414-002)
- "Drop-In" replacement cross reference number for Mykrolis® (Millipore®) Part #: WPGV-203-TH



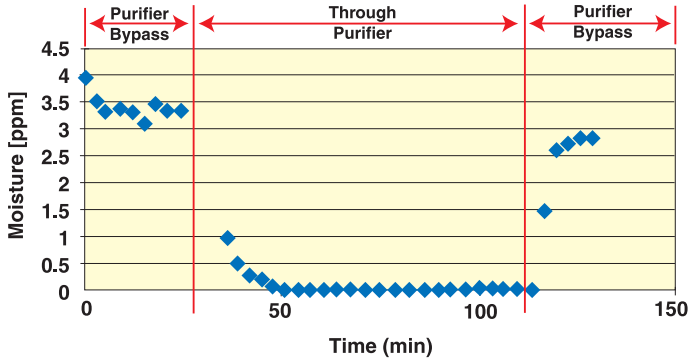
**MATHESON  
TRI•GAS**

ask. . The Gas Professionals™

Dimensions in inches (mm)

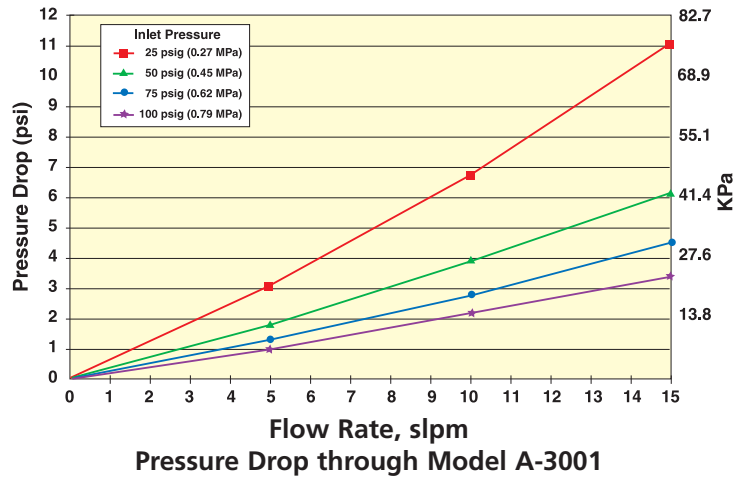


## Matheson Tri-Gas® NANO-CHEM® A-300I Purifier



**Efficiency of ASX™ for Removal of Moisture in AsH<sub>3</sub> at 0.4 slpm (0.024 NM<sup>3</sup>/hr) (similar performance for PHX™ with PH<sub>3</sub>)**

*Within 20 minutes, ASX™ medium reduced moisture to detection limits despite high challenge (3.5 ppm) and low flow rate (0.4 slpm / 0.024 NM<sup>3</sup>/hr)*



**Pressure Drop through Model A-300I**

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 Printed in USA PB025 6/03