

NANOCHEM® A-300I AsH₃ and PH₃ Purifier

For III-V Compound Semiconductor Epitaxy

Features and Benefits

- Direct purification for 100% AsH₃ and PH₃ 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 AsH₃ and PH₃
- 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 AsH₃ and PH₃
- ASX™ and PHX™ media performance specifications:
 - < 1 ppb H₂O in inert gas (APIMS LDL)
 - < 75 ppb H₂O in AsH₃ (MAH-2 LDL)
 - < 45 ppb H₂O in PH₃ (FTIR LDL)
 - < 300 ppb CO₂ in inert gas (PHX™, GC-DID LDL)
- Expect to remove oxyacids: H_xAs_yO_z & H_xP_yO_z
- 0.003 µm Pall® Teflon PTFE particle filter with 99.9999999% retention
- Recommended flows: up to 15 slpm (0.9 NM³/hr)
- Maximum feed AsH₃ /PH₃ 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% AsH₃ and PH₃ 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 AsH₃ and PH₃, moisture is known to increase with cylinder use. NANOCHEM® A-300I purifiers provide protection from such moisture surges from source AsH₃ and PH₃ gases, and from system upsets, such as leaks in the process line and cylinder changes.

Connections and Model Numbers

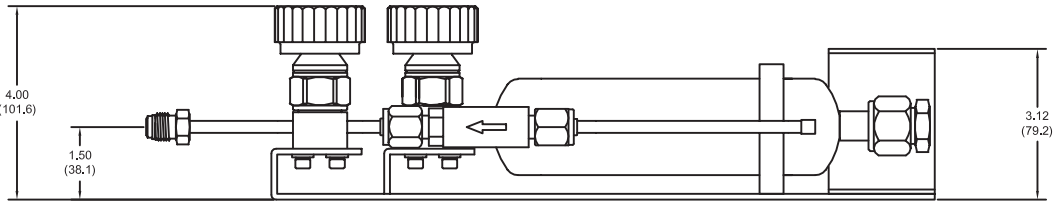
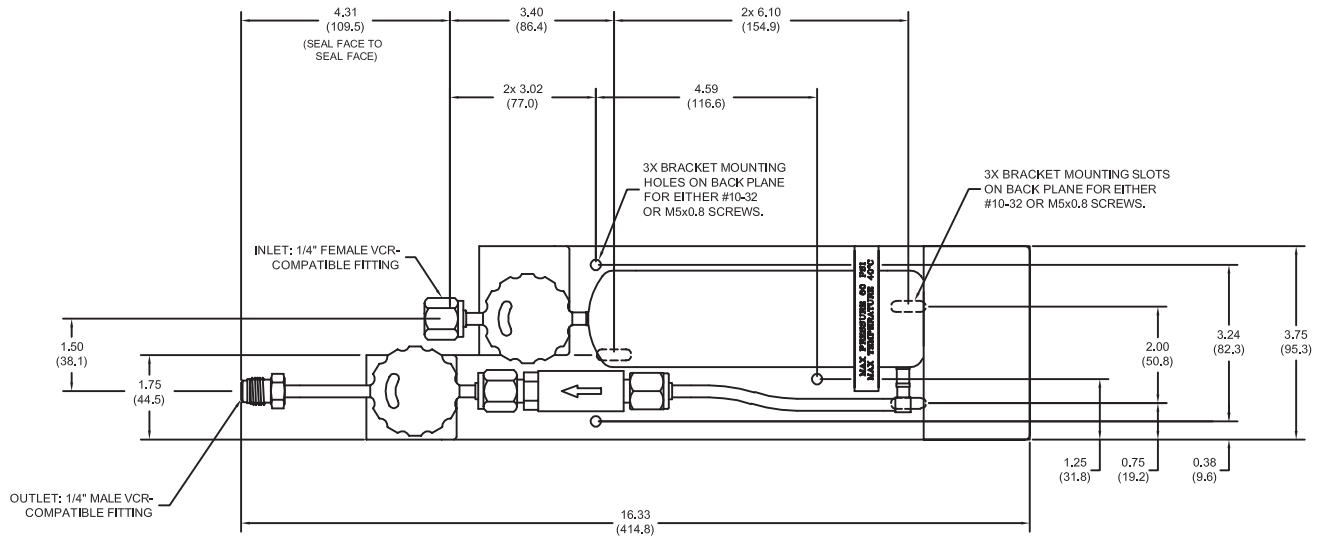
- Female inlet and male outlet are 1/4"VCR®-compatible face seal fittings
- AsH₃ Model: A-300I-ASX™ (Part # S1060-0414-001)
- PH₃ Model: A-300I-PHX™ (Part # S1060-0414-002)
- "Drop-In" replacement cross reference number for Mykrolis® (Millipore®) Part #: WPGV-203-TH



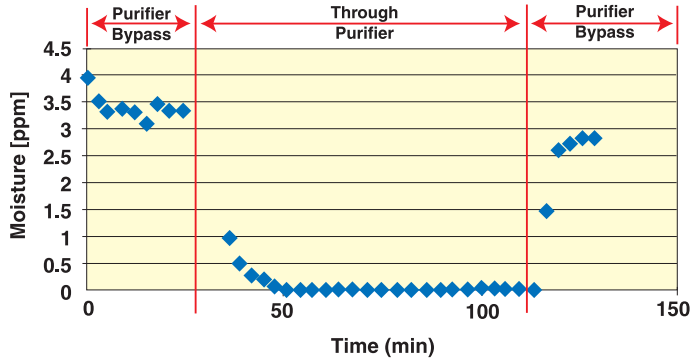
**MATHESON
TRI•GAS**

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Dimensions in inches (mm)

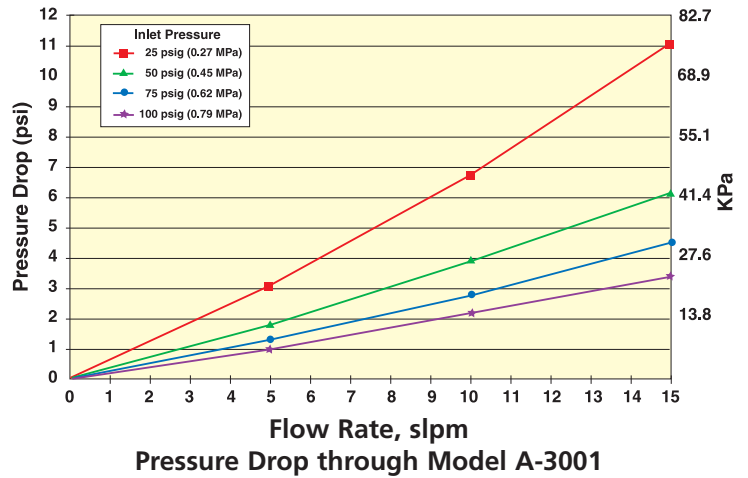


Matheson Tri-Gas® NANO-CHEM® A-300I Purifier



Efficiency of ASX™ for Removal of Moisture in AsH₃ at 0.4 slpm (0.024 NM³/hr) (similar performance for PHX™ with PH₃)

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 NM³/hr)



Pressure Drop through Model A-300I

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