NANOCHEM® A-300I AsH_3 and PH_3 Purifier

For III-V Compound Semiconductor Epitaxy

Features and Benefits

- Direct purification for 100% AsH_3 and PH_3 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_3 and PH_3
- 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_3 and PH_3
- ASX™ and PHX™ media performance specifications:
  - < 1 ppb H_2O in inert gas (APIMS LDL)
  - < 75 ppb H_2O in AsH_3 (MAH-2 LDL)
  - < 45 ppb H_2O in PH_3 (FTIR LDL)
  - < 300 ppb CO_2 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 NM^3/hr)
- Maximum feed AsH_3 /PH_3 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

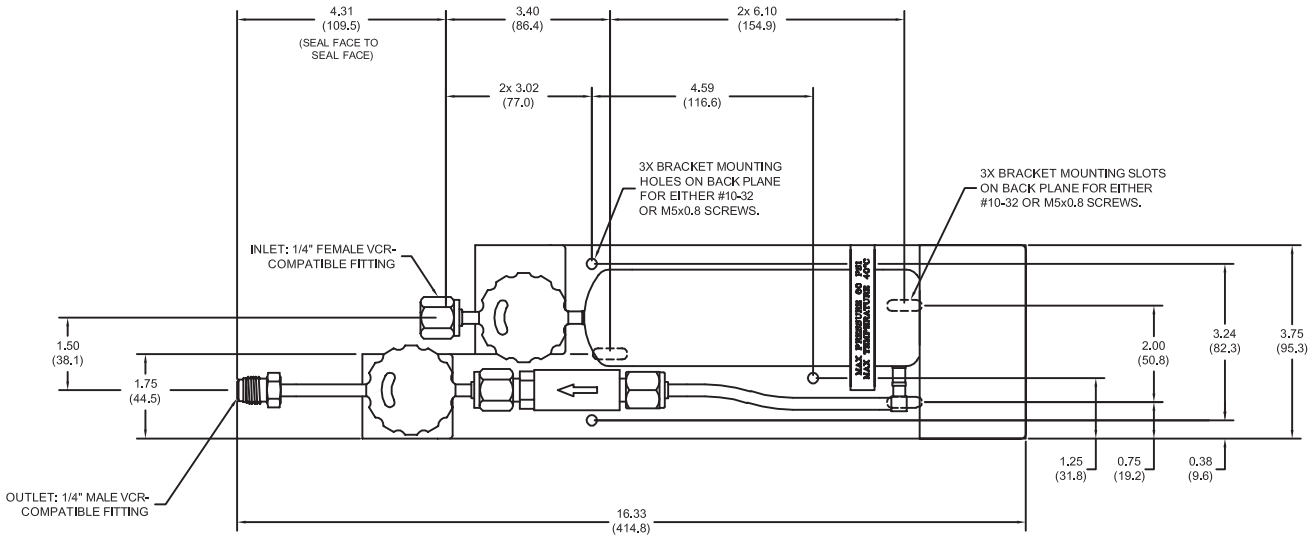
NANOCHEM® A-300I series purifiers offer a new, patented breakthrough technology alternative to the purification of 100% AsH_3 and PH_3 used in the III-V Compound Semiconductor Epitaxy Processes, with a "drop-in" replacement design.

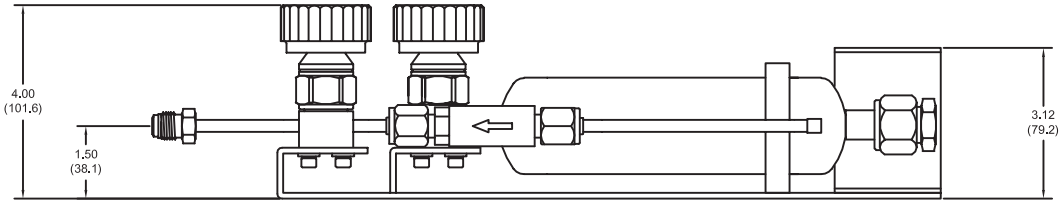
Gas contaminants, especially moisture and oxygen-containing species, adversely affect process quality and reduce yields. In AsH_3 and PH_3, moisture is known to increase with cylinder use. NANOCHEM® A-300I purifiers provide protection from such moisture surges from source AsH_3 and PH_3 gases, and from system upsets, such as leaks in the process line and cylinder changes.

Connections and Model Numbers

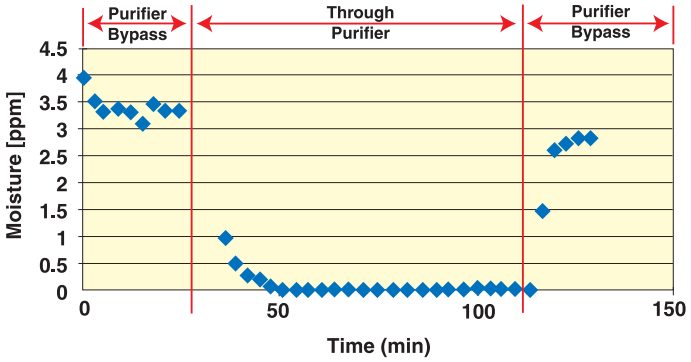
- Female inlet and male outlet are 1/4"VCR®-compatible face seal fittings
- AsH_3 Model: A-300I-ASX™ (Part # S1060-0414-001)
- PH_3 Model: A-300I-PHX™ (Part # S1060-0414-002)
- "Drop-In" replacement cross reference number for Mykrolis® (Millipore®) Part #: WPGV-203-TH

Dimensions in inches (mm)



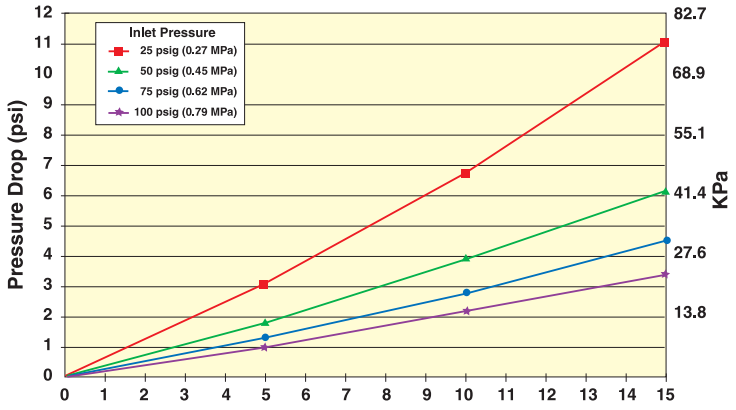


Matheson Tri-Gas® NANOCHEM® A-300I Purifier



Efficiency of ASX™ for Removal of Moisture in AsH_3 at 0.4 slpm (0.024 NM^3/hr) (similar performance for PHX™ with PH_3)

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^3/hr)



Flow Rate, slpm
Pressure Drop through Model A-3001

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