NANOCHEM® A-Series™ Purifiers
(for NANOCHEM® SideCar™ Purification Cabinet)

Features and Benefits
- Purification for all ultra-high purity applications to include low temperature epitaxy
- Compatible with the NANOCHEM® SideCar™ Purification Cabinet
- Process-qualified as part of the NANOCHEM® SideCar™ Purification Cabinet with the ASM® Epsilon® Epitaxy process tool
- **Highest Purifier Lifetimes (liter per liter basis)**
- **Best Impurity Removal Efficiencies**
  - Removes critical contaminants to sub parts-per-billion level
- **End-Point Detection available for inert gases and Hydrogen**
- Enhances manufacturing process economy and improves equipment performance
- Provides consistently high purity gas under fluctuating inlet impurity conditions
- Improves component lifetime and reduces particle generation by removing moisture and volatile metals from corrosive gases such as Hydrogen Chloride
- Low overall cost of ownership
- Requires little or no conditioning of purification media
- Easy to install and operate. Does not require heating or cooling
- All metal parts, Type 316L Stainless Steel, Elgiloy® or Nickel 200 (except Kel-F® valve seat and PTFE particle filter for corrosive gases)
- Manual inlet and outlet springless diaphragm valves included
- Mounting bracket ensures package stability and integrity
- Resin refills available for hydrogen and inert gases

Specifications
- 0.003 µm particle filter with 99.9999999% retention (PTFE or 316L SS, gas dependent)
- Recommended for flow 10 sccm (0.0006 NM^3/hr) up to 200 slpm (12 NM^3/hr)
- Internal surface finish < 15 µin Ra
- Maximum allowance working pressure of 150 psig (1.13 MPa) with fiber-optic end-point detector or 500 psig (3.5 MPa) without end-point detector
- Maximum operating temperature of 70°C

Connections
- Female inlet and male outlet connections 1/4" VCR®-compatible face seal fittings

Overview
The NANOCHEM® A-Series™ Purifier is a Matheson Tri-Gas, Inc. proprietary purification solution for the NANOCHEM® SideCar™ Purification Cabinet. Gas impurities, such as moisture and oxygen, adversely affect the quality of films deposited via epitaxy and atomic layer deposition (ALD). Those impurities are present in both bulk gas systems and gas cylinders and can also be introduced through leaks in the line or during cylinder changes. NANOCHEM® purification media remove such impurities to deliver consistently pure gas to the process, improving product consistency and yields.

Capabilities Summary

Gas Type	Impurities Removed
Nitrogen (N_2), Hydrogen (H_2), other inerts	< 0.1 ppb H_2O, O_2, CO_2 LDL < 1 ppb CO* < 0.1 ppb NMHC (with OMX-Plus™) LDL NO_x, SO_x, H_2S
Hydrogen Chloride (HCl)	< 1 ppb H_2O in inert gas < 150 ppb H_2O in HCl Volatile Metals: Fe, Mo, Cr, Ni, Mn, Ti

LDL – Lower Detection Limit by State-of-the-Art Analytical Instrumentation
NMHC – Non-methane Hydrocarbons
*NOTE: CO is removed efficiently by OMX & OMX-Plus™ media at low flow rates (recommend 1/10 of normal flow rate)

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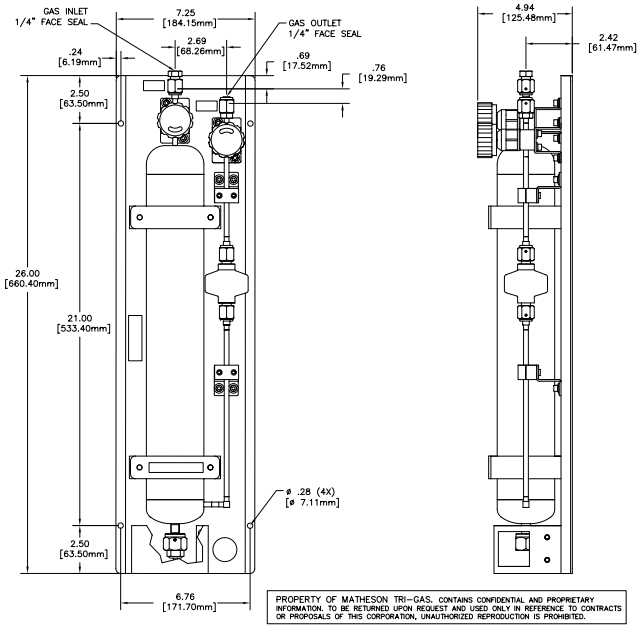
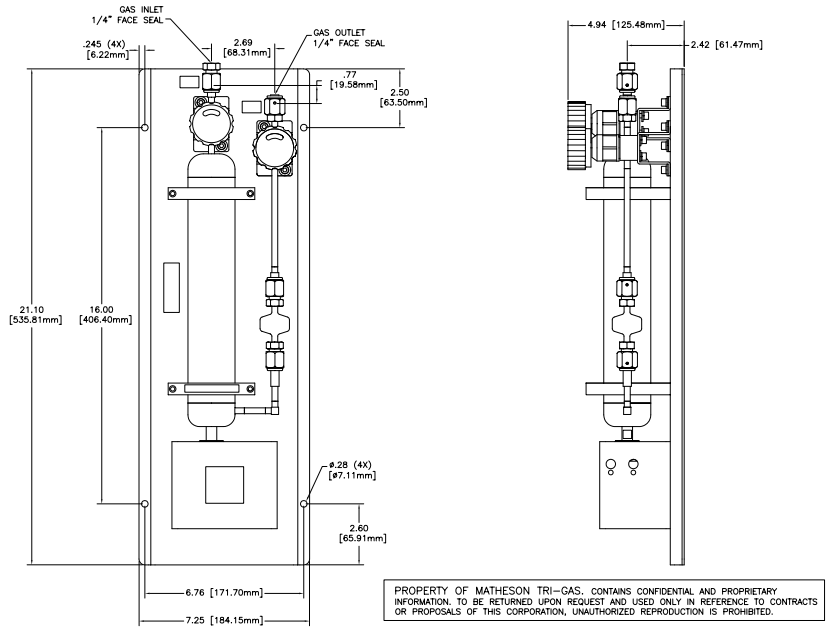
Dimensions, Flow Rates and Options

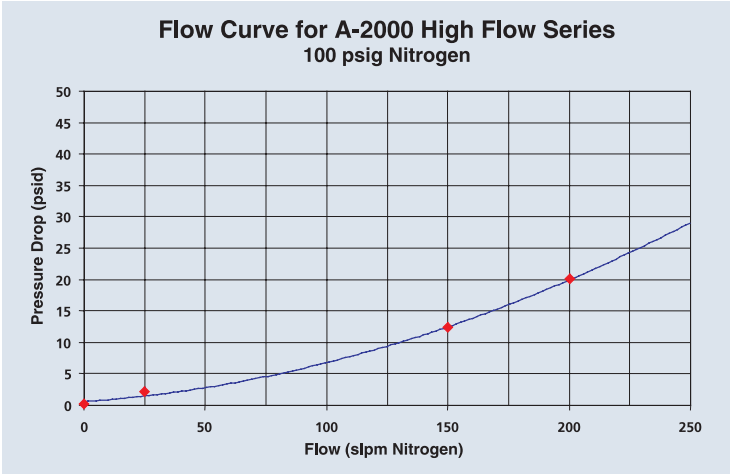


A-2000



A-500

Purifier	A-500	A-2000
Purification Medium bed volume - milliliters	500	2000
Maximum recommended flow rating - slpm nitrogen	50	75
(NM^3/hr) nitrogen	(3.0)	(4.5)
With upgraded filter and valves - slpm nitrogen	75	200
(NM^3/hr) nitrogen	(4.5)	(12.0)



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