

# NANOCHEM® MiniSentry™ In-Line Purifier

## Features and Benefits

- Purification for point-of-use applications
- **Highest Lifetimes**
- **Best Impurity Removal Efficiencies**
  - Removes critical contaminants to sub parts-per-billion level (<0.1 ppb in inert gases)
- Diffusion barrier at purifier inlet and outlet
  - Reduces media exposure to atmospheric air during purifier installation
- 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
- Compact size for ease of installation
- No moving parts or power requirements
- Does not require heating or cooling
- Low overall cost of ownership

## Specifications

- Flow rates up to 1.0 slpm (0.06 NM<sup>3</sup>/hr)
- All metal parts, Type 316L stainless steel
- 0.003 µm PALL Ultramet-L® stainless steel particle filter with 99.999999% retention
- Outer diameter of 0.84 inches (21.5 mm) and total length of 3.31 inches (84.07 mm)
- Internal surface finish < 15 µin R<sub>a</sub>
- Maximum allowable working pressure of 3000 psig (21 MPa)
- Maximum operating temperature of 70°C

## Connections

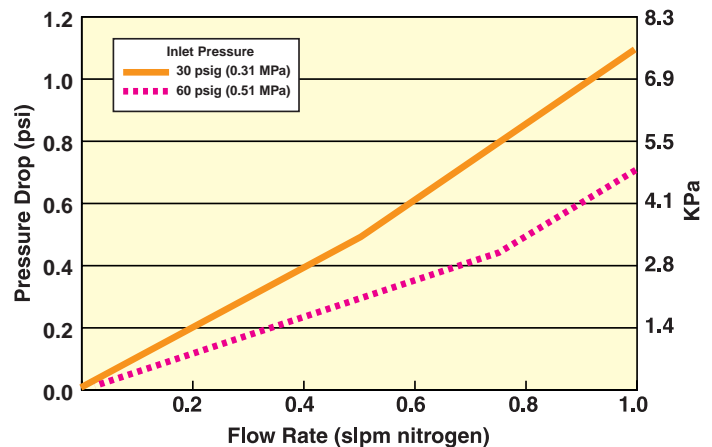
- Male inlet and outlet connections 1/4 inch, VCR®-compatible face seal fittings

## Overview

The NANOCHEM® MiniSentry™ Purifier is a compact purifier designed for placement internal to the process tool, delivering the gas purity required in a sub-micron fabrication environment.

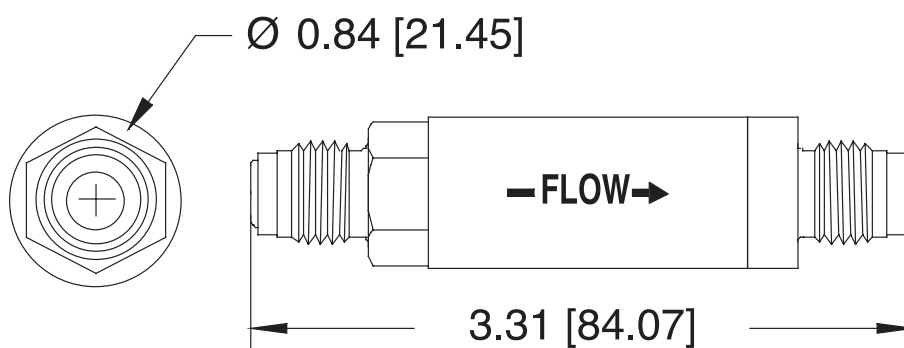
This product is an in-line purifier for low-flow point-of-use applications, combining gas purification and particulate filtration in a footprint of only 3.31 inches (84 mm).

NANOCHEM® purifiers provide insurance against virtually all process variables that cause contamination, including gas impurities introduced through the gas jungle. A typical location for this product would be directly before the process chamber or mass flow controller. The MiniSentry™ filter/purifier is a direct replacement for in-line particle filters.



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All dimensions are in inches (mm)

Gas Type	Impurities Removed
Nitrogen (N <sub>2</sub> ), Argon (Ar), other inerts	< 0.1 ppb H <sub>2</sub> O, O <sub>2</sub> , CO <sub>2</sub> LDL < 1 ppb CO* < 0.1 ppb NMHC LDL NO <sub>x</sub> , SO <sub>x</sub> , H <sub>2</sub> S
Ammonia (NH <sub>3</sub> )	< 0.1 ppb H <sub>2</sub> O, O <sub>2</sub> , CO <sub>2</sub> in inert gas LDL < 45 ppb H <sub>2</sub> O in ammonia LDL
Silane (SiH <sub>4</sub> )	< 0.1 ppb H <sub>2</sub> O, O <sub>2</sub> , CO <sub>2</sub> LDL < 1 ppb CO* Chlorosilanes, disilane, siloxanes, arsine, phosphine
Hydrogen (H <sub>2</sub> ), Methane (CH <sub>4</sub> ), Ethane (C <sub>2</sub> H <sub>6</sub> ), other HC	< 0.1 ppb H <sub>2</sub> O, O <sub>2</sub> , CO <sub>2</sub> LDL < 1 ppb CO* NO <sub>x</sub> , SO <sub>x</sub> , H <sub>2</sub> S
Sulfur Hexafluoride (SF <sub>6</sub> ), Carbon Tetrafluoride (CF <sub>4</sub> ), other fluorocarbons	< 0.1 ppb H <sub>2</sub> O, O <sub>2</sub> , CO <sub>2</sub> in inert gas LDL < 10 ppb O <sub>2</sub> , H <sub>2</sub> O in sulfur hexafluoride LDL
Oxygen (O <sub>2</sub> ), Carbon Dioxide (CO <sub>2</sub> ), Nitrous Oxide (N <sub>2</sub> O)	< 10 ppb H <sub>2</sub> O
Carbon Monoxide (CO)	Metal Carbonyls: Fe, Ni
Corrosives (HCl, HBr, Cl <sub>2</sub> , SiH <sub>2</sub> Cl <sub>2</sub> , SiHCl <sub>3</sub> , BCl <sub>3</sub> )	< 1 ppb H <sub>2</sub> O in inert gas < 100 ppb H <sub>2</sub> O in HBr LDL < 150 ppb H <sub>2</sub> O 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)

For a detailed list of purification media and impurities removed, refer to the Purification Media Table in NANOCHEM® Purification Solutions Brochure.

#### Equipment Technology Center

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Printed in USA PB033 R05/05



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