

# NANOCHEM® Bulk Gas Purifier

## (P-Series & MegaShield™)

### Features and Benefits

- For bulk and high flow specialty gas purification
- **Highest Lifetimes**
- **Best Impurity Removal Efficiencies**
  - Removes critical contaminants to sub part-per-billion levels
- **End-Point Detection available for many gases, at no extra charge.**
- Enhances manufacturing process economy and improves equipment performance
- Provides consistently high purity gas, regardless of inlet impurity fluctuations
- Improves component lifetime and reduces particle generation by removing moisture from corrosive gases
- Easy to install & operate
- No heating or cooling required
- Quick start up
- Inlet and outlet isolation valves
- All metal parts, Type 316L stainless steel, or Nickel 200
- Mounting bracket
- Refills available for most gases (except toxic or corrosive gases)

### Specifications

- 0.003 µm filter with 99.9999999% retention – Standard on P-4000 and all ammonia purifiers
- Internal surface finish < 15 µin Ra
- Maximum operating temperature is 70°C
- Maximum operating pressure is 150 psig (1.13 MPa) *with* endpoint detection; 350 psig (3.51 MPa) *without* endpoint detection

### Connections

- Female inlet and outlet connections, 1/2" VCR®-compatible face seal fittings

### Options

- 0.003 µm filter with 99.9999999% retention available
- Exhausted enclosure available. Satisfies Uniform Fire Code (UFC) requirements for hazardous gases
- Three-valve manifold with isolation and bypass valves allows disconnection of purifier without interrupting process gas flow

### Overview

NANOCHEM® MegaShield™ Purifiers ensure gas consistency for bulk gas purification. Select P-Series purifiers for flows up to 400 slpm (24 Nm³/hr) and MS-Series purifiers for flow rates up to 1000-1500 slpm (60-90 Nm³/hr). A variety of sizes are available to meet capacity and lifetime requirements. Fourteen (14) different purification media are available to purify 33 gases.

### P-Series

P-Series purifiers are available in 4, 8, 16 and 32 liter sizes. The purifier comes completely assembled, and consists of an inlet and outlet diaphragm valve; 1-4 canister(s) with suitable purification media, and a 40 µm SS frit on the inlet and outlet. A 0.003 µm filter is standard on the outlet of the P-4000 and all ammonia purifiers and is available as an option on all other P-series purifiers.

### MegaShield™ (MS-Series)

MS-Series purifiers enable higher flow rates and lower pressure drops than the corresponding P-Series Models. MS-Series purifiers are available in 8, 16, and 32 liter sizes. The purifier comes completely assembled, and consists of an inlet and outlet springless diaphragm valve; 2-4 canisters with suitable purification media, and a 100 µm SS frit on the inlet and outlet.

MS-Series purifiers are completely retrofittable in P-Series installations. Media refills are available through Matheson Tri-Gas, Inc., for all sizes.



| 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<br>< 1 ppb CO*<br>< 0.1 ppb NMHC (with OMX-Plus™) LDL<br>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<br>< 1 ppb CO*<br>< 45 ppb H <sub>2</sub> O in ammonia LDL<br>NH <sub>3</sub> -CO <sub>2</sub> complexes, SiH <sub>4</sub> , Siloxanes, GeH <sub>4</sub> , H <sub>2</sub> S |
| Silane (SiH <sub>4</sub> )   | < 0.1 ppb H <sub>2</sub> O, O <sub>2</sub> , CO <sub>2</sub> LDL<br>< 1 ppb CO*<br>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<br>< 1 ppb CO*<br>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<br>< 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<br>< 100 ppb H <sub>2</sub> O in HBr LDL<br>< 150 ppb H <sub>2</sub> O in HCl<br>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.



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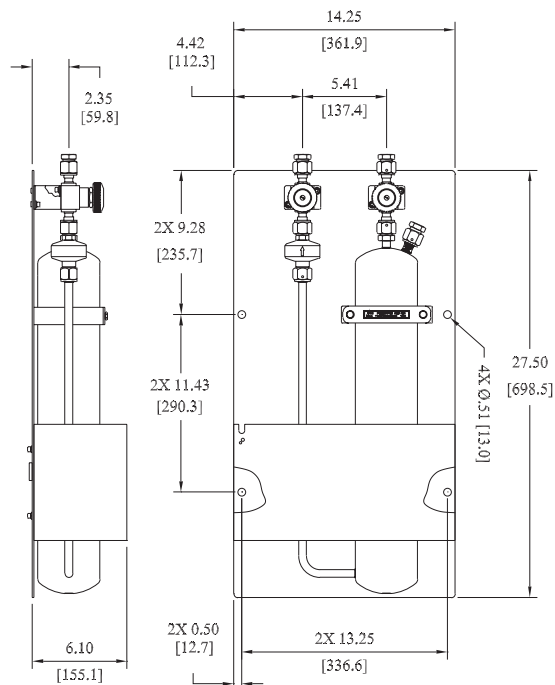
# NANOCHEM® P-Series and MegaShield™ Gas Purifiers

| Specifications  | Model   |                           |                 |                 |   |                 |
|---|---|---------------------------|-----------------|-----------------|---|-----------------|
|   | P-4000  | P -8000                   | P-16000         | P-32000         | MS-8000   | MS-16 / 32000   |
| Max flow rate, slpm (NM <sup>3</sup> /hr) of N <sub>2</sub> * | 150 (9)   | 250 (15)                  | 400 (24)        | 400 (24)        | 1000 (60) *   |                 |
| Max Pressure, psig (MPa) **                                   | 350 (2.51)  |                           |                 |                 | 350 (2.51)  |                 |
| Purification medium bed volume, Liters                        | 4   |                           | 8               | 16              | 8   | 16, 32          |
| Wetted Parts  | 316L SS body and filter; Nickel 200 gaskets; PCTFE valve seat |                           |                 |                 | 316L SS, Nickel 200 gaskets, PCTFE & TFE valve components |                 |
| Connection Type   | 1/2" Female VCR®-compatible face-seal fittings                |                           |                 |                 |   |                 |
| Standard outlet filter  | 0.003 µm, 9-log retention                                     | 40 µm frit                |                 |                 | 100 µm frit   |                 |
| Optional filter   | N/A   | 0.003 µm; 9-log retention |                 |                 |   |                 |
| Flow Rate w/ optional filter, slpm N <sub>2</sub> *           | 150   |                           |                 |                 | 1000  |                 |
| Dimensions, inches (mm)                                       |   |                           |                 |                 |   |                 |
| <b>A</b> - Width of purifier mounting plate                   | 14.25 (361.95)  | 14.25 (361.95)            | 14.25 (361.95)  | 14.25 (361.95)  | 14.25 (361.95)  | 14.25 (361.95)  |
| <b>B</b> - Depth of purifier                                  | 7.00 (177.8)  | 7.00 (177.8)              | 11.29 (286.77)  | 11.29 (286.77)  | 7.00 (177.8)  | 11.29 (286.77)  |
| <b>C</b> - Height of purifier mounting plate                  | 27.5 (69.85)  | 27.5 (69.85)              | 49.38 (1254.25) | 49.38 (1254.25) | 27.5 (69.85)  | 49.38 (1254.25) |
| <b>D</b> - In/Out center line to mounting plate               | 2.35 (59.69)  | 2.35 (59.69)              | 3.38 (85.73)    | 3.38 (85.73)    | 2.35 (59.69)  | 3.38 (85.73)    |
| <b>E</b> - Mounting plate top to in / out connection          | 0.45 (11.43)  | 0.45 (11.43)              | 0.45 (11.43)    | 0.45 (11.43)    | 0.45 (11.43)  | 0.45 (11.43)    |
| <b>F</b> - Distance between bolt holes                        | 13.25 (336.55)  | 13.25 (336.55)            | 13.25 (336.55)  | 13.25 (336.55)  | 13.25 (336.55)  | 13.25 (336.55)  |
| <b>G</b> - Distance between in / out connections              | 5.41 (137.41)   | 5.41 (137.41)             | 5.41 (137.41)   | 5.41 (137.41)   | 5.41 (137.41)   | 5.41 (137.41)   |
| <b>H</b> - Distance between plate top & bolt hole             | 9.28 (235.71)   | 9.28 (235.71)             | 9.73 (247.14)   | 9.73 (247.14)   | 9.28 (235.71)   | 9.73 (247.14)   |
| <b>I</b> - Bolt hole diameter                                 | Ø 0.50 (12.70)  | Ø 0.50 (12.70)            | Ø .51 (12.95)   | Ø .51 (12.95)   | Ø 0.50 (12.70)  | Ø 0.50 (12.70)  |

\* All P-8000, P-16000 and P-32000 purifiers with OMA resin are provided with a filter which removes 99.9999999% (9-log) of all particles ≥ 0.003 µm. This filter limits the maximum flow to 150 slpm of nitrogen. The filter is also standard on P-4000 purifiers for all gases.

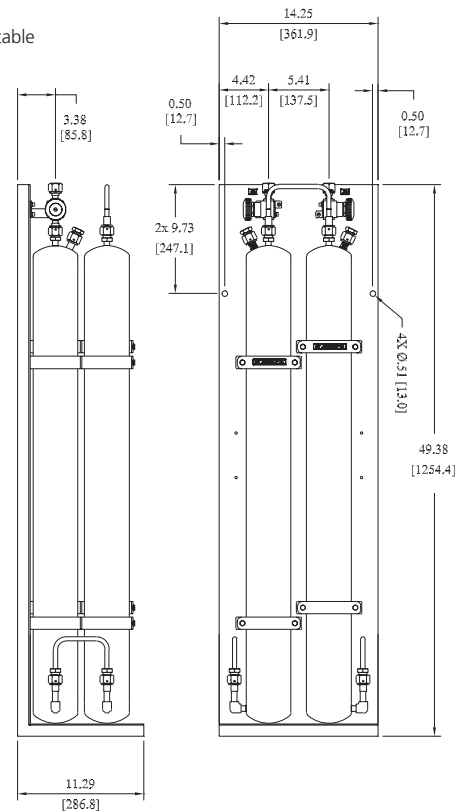
NOTE: The maximum specified flow rate is based upon a 10 psi (0.07 MPa) pressure drop. Flow rates up to 1500 slpm (90 NM<sup>3</sup>/hr) can be attained with the MS-Series, if higher pressure drops are acceptable

\*\* Maximum operating pressure is 150 psi (1.13 MPa) when the endpoint detector is installed.



**P-4000, P-8000, MS-8000**

(P-4000 displayed with 1 canister; P-8000 has same dimensions but 2 canisters)



**P-16000, P-32000, MS-16,000, MS-32000**

(P-32000 shown with 4 canisters, P-16000 has 2 canisters)

Specifications are subject to change.

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