# NANOCHEM<sup>®</sup> Bulk Gas Purifier (MegaShield<sup>™</sup>)

#### **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 MS-4000 and all ammonia purifiers
- Internal surface finish < 15  $\mu$ in 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
- Three-valve manifold with isolation and bypass valves allows disconnection of purifier without interrupting process gas flow

#### Overview

NANOCHEM<sup>®</sup> MegaShield<sup>™</sup> Purifiers ensure gas consistency for bulk gas purification. Select MS-Series purifiers for flow rates up to 1000-1500 slpm (60-90 Nm<sup>3</sup>/hr). A variety of sizes are available to meet capacity and lifetime requirements. Seventeen (17) different purification media are available to purify over 70 gases.

## MegaShield<sup>™</sup> (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 4, 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  $\mu$ m SS frit on the inlet and outlet.

MS-Series purifiers are completely retrofittable in P-Series installations. Media refills are available through MATHESON for all sizes.



Gas Type	Impurities Removed	
Nitrogen (N <sub>2</sub> ), Argon (Ar),	< 100 ppt H <sub>2</sub> O, O <sub>2</sub> , CO <sub>2</sub> LDL	
other inerts	< 1 ppb CO*	
	< 100 ppt NMHC (with OMX-Plus™) LDL	
	NO <sub>x</sub> , SO <sub>x</sub> , H <sub>2</sub> S	
Ammonia (NH₃)	< 100 ppt $H_2O$ , $O_2$ , $CO_2$ in inert gas LDL	
	< 1 ppb CO*	
	< 45 ppb H <sub>2</sub> O in ammonia LDL	
	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> )	< 100 ppt H <sub>2</sub> O, O <sub>2</sub> , CO <sub>2</sub> LDL	
	< 1 ppb CO*	
	Chlorosilanes, disilane, siloxanes, arsine, phosphine	
Hydrogen ( $H_2$ ), Methane $CH_4$ ),	< 100 ppt H <sub>2</sub> O, O <sub>2</sub> , CO <sub>2</sub> LDL	
Ethane ( $C_2H_6$ ), other HC	< 1 ppb CO*	
	NO <sub>x</sub> , SO <sub>x</sub> , H <sub>2</sub> S	
Sulfur Hexafluoride (SF <sub>6</sub> ),	< 100 ppt $H_2O$ , $O_2$ , $CO_2$ in inert gas LDL	
Carbon Tetrafluoride (CF <sub>4</sub> ),	< 10 ppb $O_2$ , $H_2O$ in sulfur hexafluoride LDL	
other fluorocarbons		
Oxygen (O <sub>2</sub> ), Carbon Dioxide (CO <sub>2</sub> ),	< 10 ppb H <sub>2</sub> O	
Nitrous Oxide (N <sub>2</sub> O)		
Carbon Monoxide (CO)	Metal Carbonyls: Fe, Ni	
Corrosives	< 1 ppb H <sub>2</sub> O in inert gas	
(HCI, HBr, CI <sub>2</sub> , SiH <sub>2</sub> CI <sub>2</sub> , SiHCI <sub>3</sub> , BCI <sub>3</sub> )	$< 100 \text{ ppb H}_2\text{O} \text{ in HBr}$ LDL	
	$< 150 \text{ ppb H}_2\text{O}$ 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<sup>™</sup> 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.



# NANOCHEM<sup>®</sup> MegaShield<sup>™</sup> Gas Purifiers

	Model	
Specifications	MS-4000 / 8000	MS-16000 / 32000
Max flow rate, slpm (NM <sup>3</sup> /hr) of N <sub>2</sub> *	1000 (60) *	
Max Pressure, psig (MPa) **	350 (2.51)	
Purification medium bed volume, Liters	4, 8	16, 32
Wetted Parts	316L SS, Nickel 200 gaskets,	
	PCTFE & TFE valve components	
Connection Type	1/2" Female VCR®-compatible face-seal fittings	
Standard outlet filter	100 µm frit	
Optional filter***	0.003 µm; 9-log retention	
Flow Rate w/ optional filter, slpm $N_2$ *	1000	
Dimensions, inches (mm)		
A - Width of purifier mounting plate	14.25 (361.95)	14.25 (361.95)
<b>B</b> - Depth of purifier	7.00 (177.8)	11.29 (286.77)
C - Height of purifier mounting plate	27.5 (69.85)	49.38 (1254.25)
<b>D</b> - In/Out center line to mounting plate	2.35 (59.69)	3.38 (85.73)
E - Mounting plate top to in / out connection	0.45 (11.43)	0.45 (11.43)
F - Distance between bolt holes	13.25 (336.55)	13.25 (336.55)
G - Distance between in / out connections	5.41 (137.41)	5.41 (137.41)
H - Distance between plate top & bolt hole	9.28 (235.71)	9.73 (247.14)
I - Bolt hole diameter	Ø 0.50 (12.70)	Ø 0.50 (12.70)

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<sub>3</sub>/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.

\*\*\* 0.003 µm filter standard on MS-4000



MS-4000, MS-8000 (shown)

#### Equipment Technology Center

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MS-16,000, MS-32000

