NANOCHEM® H/HP-Series Gas Purifiers

Features and Benefits

- Purification for all ultra-high purity applications
- Highest Lifetimes
- Best Impurity Removal Efficiencies
 - Removes critical contaminants to sub parts-per-billion level (< 0.1 ppb in inert gases)
- End-Point Detection available (H-Series)
- 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
- No moving parts or power requirements
- Easy to operate
- Built-in 1-valve bypass
- Does not require heating or cooling
- Low overall cost of ownership
- Media refills available for all sizes
- Inlet and outlet springless diaphragm valves

Specifications

- All metal parts, Type 316L stainless steel, nickel and Elgiloy® valve diaphragm
- 0.003 µm particle filter with 99.9999999% retention (PTFE or 316L SS)
- Internal surface finish < 15 μin R_a
- H-Series: Maximum allowable working pressure of 150 psig (1.13 MPa) with the fiber optic end-point detector or 500 psig (3.5 MPa) without detector
- HP-Series: Maximum allowable working pressure of 2850 psig (19.7 MPa)
- Maximum operating temperature of 70°C

Connections

• Female inlet and male outlet 1/4 inch VCR®-compatible face seal fittings

Options

- Fiber optic end-point detector indicates when it is time to replace the purifier (for non-corrosive gases only)
- Pneumatically-actuated diaphragm valves
- Manually or pneumatically-actuated bellows valves

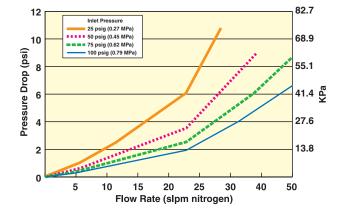
Description

The NANOCHEM® H/HP-Series Purifiers provide economical gas purification in multi-tool or single-source applications.

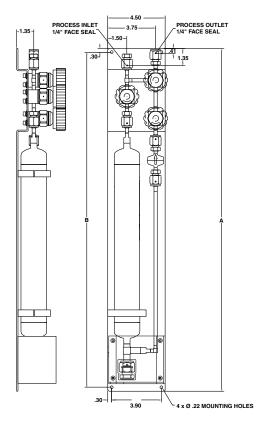
With a welded bypass valve incorporated in the purifier unit, H/HP-Series purifiers are often used in gas enclosures, both source and purge gas, where space is limited. Its low width makes it ideal for installation in restricted space or gas jungle applications where multiple vertical gas lines are being run.

Purification media refills are available through MATHESON.









Operating Pressure and Flow Rates				
	H-500	HP-500		
Maximum allowable working pressure, psig	500	2850		
MPa	3.5	19.7		
Maximum recommended flow rate slpm, N_2	50	50		
NM³/hr, N₂	3	3		

Dimensions inches (mm)		
H/HP-Series Purifier	H/HP-500	HP-300
А	26.90	21.09
	(683.26)	(535.68)
В	26.30	20.49
	(668.02)	(520.45)

Nitrogen (N ₂), Argon (Ar), other inerts	Cas Type	Impunities Demoused
Ammonia (NH ₃) Ammonia (NH ₃) Co.1 ppb NMHC (with OMX-Plus TM) LDL NO _x , SO _x , H ₂ S Ammonia (NH ₃) Co.1 ppb H ₂ O, O ₂ , CO ₂ in inert gas LDL considered probability and the second probability and s	Gas Type	Impurities Removed
 < 0.1 ppb NMHC (with OMX-Plus™) LDL NO₂, SO₂, H₂S Ammonia (NH₃) < 0.1 ppb H₂O, O₂, CO₂ in inert gas LDL < 1 ppb CO* < 45 ppb H₂O in ammonia LDL NH₃-CO₂ complexes, SiH₄, Siloxanes, GeH₄, H₂S Silane (SiH₄) < 0.1 ppb H₂O, O₂, CO₂ LDL < 1 ppb CO* Chlorosilanes, disilane, siloxanes, arsine, phosphine Arsine (AsH₃), Phosphine (PH₃) < 0.1 ppb H₂O, O₂, CO₂ LDL < 45 ppb H₂O in phosphine LDL < 75 ppb H₂O in arsine LDL CO, oxyacids (H₄As₀O₂, H₃P₀O₂) Hydrogen (H₂), Methane CH₄), Ethane (C₂H₆), other HC < 0.1 ppb H₂O, O₂, CO₂ LDL < 1 ppb CO* NO₂, SO₂, H₂S Sulfur Hexafluoride (SF₆), Carbon Tetrafluoride (CF₄), < 0.1 ppb H₂O, O₂, CO₂ in inert gas LDL 	Nitrogen (N ₂), Argon (Ar), other inerts	
NO _x , SO _x , H ₂ S Ammonia (NH ₃)		
Ammonia (NH ₃) < 0.1 ppb H₂O, O₂, CO₂ in inert gas LDL < 1 ppb CO* < 45 ppb H₂O in ammonia LDL NH₃-CO₂ complexes, SiH₄, Siloxanes, GeH₄, H₂S Silane (SiH ₄) < 0.1 ppb H₂O, O₂, CO₂ LDL < 1 ppb CO* Chlorosilanes, disilane, siloxanes, arsine, phosphine Arsine (AsH ₃), Phosphine (PH ₃) < 0.1 ppb H₂O, O₂, CO₂ LDL < 45 ppb H₂O in phosphine LDL < 75 ppb H₂O in arsine LDL CO, oxyacids (H₂As₂O₂, H₂P₂O₂) Hydrogen (H ₂), Methane CH ₄), Ethane (C ₂ H ₆), other HC < 1 ppb CO* NO_x, SO_x, H₂S Sulfur Hexafluoride (SF ₆), Carbon Tetrafluoride (CF ₄), < 0.1 ppb H₂O, O₂, CO₂ in inert gas LDL		
Silane (SiH ₄) Silane (SiH ₄) Arsine (AsH ₃), Phosphine (PH ₃) Arsine (H ₂), Methane CH ₄), Ethane (C ₂ H ₆), other HC Sulfur Hexafluoride (SF ₆), Carbon Tetrafluoride (CF ₄), Sulfur Hexafluoride (SF ₆), Carbon Tetrafluoride (CF ₄), At ppb CO* C0.1 ppb H ₂ O, O ₂ , CO ₂ LDL C0.1 ppb H ₂ O, O ₂ , CO ₂ LDL C0.1 ppb H ₂ O, in arsine LDL C0, oxyacids (H ₂ As ₂ O ₂ , H ₂ P ₂ O ₂) C1 ppb H ₂ O, O ₂ , CO ₂ LDL C1 ppb H ₂ O, O ₂ , CO ₂ LDL C1 ppb H ₂ O, O ₂ , CO ₂ LDL C1 ppb H ₂ O, O ₂ , CO ₂ LDL C2 DDL C3 1 ppb CO* NO _x , SO _x , H ₂ S Sulfur Hexafluoride (SF ₆), Carbon Tetrafluoride (CF ₄),	A / A II I \	
Silane (SiH ₄) Silane (SiH ₄) (0.1 ppb H ₂ O, O ₂ , CO ₂ LDL (1 ppb CO* (Chlorosilanes, disilane, siloxanes, arsine, phosphine Arsine (AsH ₃), Phosphine (PH ₃) (0.1 ppb H ₂ O, O ₂ , CO ₂ LDL (45 ppb H ₂ O, in phosphine LDL (75 ppb H ₂ O, in arsine LDL (O, oxyacids (H ₂ As ₂ O ₂ , H ₂ P ₂ O ₂) Hydrogen (H ₂), Methane CH ₄), Ethane (C ₂ H ₆), other HC (1 ppb H ₂ O, O ₂ , CO ₂ LDL (1 ppb H ₂ O, O ₂ , CO ₂ LDL (2 0.1 ppb H ₂ O, O ₂ , CO ₂ LDL (3 ppb CO* (3 ppb CO* (3 ppb H ₂ O, O ₂ , CO ₂ in inert gas LDL (3 ppb H ₂ O, O ₂ , CO ₂ in inert gas LDL (4 ppb CO* (5 ppb H ₂ O, O ₂ , CO ₂ in inert gas LDL	Ammonia (NH ₃)	
Silane (SiH ₄) Silane (Silane, Siloxanes, disilane, si		
Silane (SiH ₄) < 0.1 ppb H₂O, O₂, CO₂ LDL < 1 ppb CO* Chlorosilanes, disilane, siloxanes, arsine, phosphine Arsine (AsH₃), Phosphine (PH₃) < 0.1 ppb H₂O, O₂, CO₂ LDL < 45 ppb H₂O in phosphine LDL < 75 ppb H₂O in arsine LDL < 75 ppb H₂O in arsine LDL CO, oxyacids (H_xAs_yO₂, H_xP_yO₂) Hydrogen (H₂), Methane CH₄), Ethane (C₂H₆), other HC < 1 ppb CO* NO_x, SO_x, H₂S Sulfur Hexafluoride (SF₆), Carbon Tetrafluoride (CF₄), < 0.1 ppb H₂O, O₂, CO₂ in inert gas LDL		
4 1 ppb CO* Chlorosilanes, disilane, siloxanes, arsine, phosphine Arsine (AsH ₃), Phosphine (PH ₃) < 0.1 ppb H ₂ O, O ₂ , CO ₂ LDL < 45 ppb H ₂ O in phosphine LDL < 75 ppb H ₂ O in arsine LDL CO, oxyacids (H _x As _x O ₂ , H _x P _y O ₂) Hydrogen (H ₂), Methane CH ₄), Ethane (C ₂ H ₆), other HC < 0.1 ppb H ₂ O, O ₂ , CO ₂ LDL < 1 ppb CO* NO _x , SO _x , H ₂ S Sulfur Hexafluoride (SF ₆), Carbon Tetrafluoride (CF ₄), < 0.1 ppb H ₂ O, O ₂ , CO ₂ in inert gas LDL		
Chlorosilanes, disilane, siloxanes, arsine, phosphine Arsine (AsH ₃), Phosphine (PH ₃)	Silane (SiH ₄)	
Arsine (AsH ₃), Phosphine (PH ₃) < 0.1 ppb H ₂ O, O ₂ , CO ₂ LDL < 45 ppb H ₂ O in phosphine LDL < 75 ppb H ₂ O in arsine LDL CO, oxyacids (H _x As _y O _z , H _x P _y O _z) Hydrogen (H ₂), Methane CH ₄), Ethane (C ₂ H ₆), other HC < 1 ppb CO* NO _x , SO _x , H ₂ S Sulfur Hexafluoride (SF ₆), Carbon Tetrafluoride (CF ₄), < 0.1 ppb H ₂ O, O ₂ , CO ₂ in inert gas LDL		
45 ppb H ₂ O in phosphine LDL 75 ppb H ₂ O in arsine LDL CO, oxyacids (H ₂ As ₂ O ₂ , H ₂ P ₂ O ₂) Hydrogen (H ₂), Methane CH ₄), Ethane (C ₂ H ₆), other HC 40.1 ppb H ₂ O, O ₂ , CO ₂ LDL 1 ppb CO* NO _x , SO _x , H ₂ S Sulfur Hexafluoride (SF ₆), Carbon Tetrafluoride (CF ₄), < 0.1 ppb H ₂ O, O ₂ , CO ₂ in inert gas LDL		
$ < 75 \text{ ppb H}_2\text{O in arsine LDL} \\ \text{CO, oxyacids } (\text{H}_x\text{As}_y\text{O}_z, \text{H}_x\text{P}_y\text{O}_z) \\ \text{Hydrogen (H}_2\text{), Methane CH}_4\text{), Ethane } (\text{C}_2\text{H}_6\text{), other HC} \\ < 0.1 \text{ ppb H}_2\text{O, O}_2, \text{ CO}_2 \text{ LDL} \\ < 1 \text{ ppb CO*} \\ \text{NO}_x, \text{ SO}_x, \text{ H}_2\text{S} \\ \text{Sulfur Hexafluoride } (\text{SF}_6\text{), Carbon Tetrafluoride } (\text{CF}_4\text{),} \\ < 0.1 \text{ ppb H}_2\text{O, O}_2, \text{ CO}_2 \text{ in inert gas LDL} \\ \end{aligned} $	Arsine (AsH ₃), Phosphine (PH ₃)	
CO, oxyacids $(H_xAs_yO_z, H_xP_yO_z)$ Hydrogen (H_2) , Methane CH_4), Ethane (C_2H_6) , other HC $< 0.1 \text{ ppb } H_2O, O_2, CO_2 \text{ LDL}$ $< 1 \text{ ppb } CO^*$ NO_x , SO_x , H_2S Sulfur Hexafluoride (SF_6) , Carbon Tetrafluoride (CF_4) , $< 0.1 \text{ ppb } H_2O, O_2, CO_2 \text{ in inert gas } LDL$		
Hydrogen (H_2) , Methane CH_4), Ethane (C_2H_6) , other HC $< 0.1 \text{ ppb } H_2O$, O_2 , CO_2 LDL $< 1 \text{ ppb } CO^*$ NO _x , SO _x , H ₂ S $< 0.1 \text{ ppb } H_2O$, O_2 , CO_2 in inert gas LDL		
< 1 ppb CO* NO _x , SO _x , H ₂ S Sulfur Hexafluoride (SF ₆), Carbon Tetrafluoride (CF ₄), < 0.1 ppb H ₂ O, O ₂ , CO ₂ in inert gas LDL		
$NO_{xr} \stackrel{\cdot}{S}O_{xr} \stackrel{\cdot}{H_2}S$ Sulfur Hexafluoride (SF ₆), Carbon Tetrafluoride (CF ₄), < 0.1 ppb H ₂ O, O ₂ , CO ₂ in inert gas LDL	Hydrogen (H_2), Methane CH_4), Ethane (C_2H_6), other HC	
Sulfur Hexafluoride (SF ₆), Carbon Tetrafluoride (CF ₄), < 0.1 ppb H ₂ O, O ₂ , CO ₂ in inert gas LDL		
	other fluorocarbons	< 10 ppb O ₂ , H ₂ O in sulfur hexafluoride LDL
Oxygen (O_2) , Carbon Dioxide (CO_2) , Nitrous Oxide (N_2O) < 10 ppb H_2O	Oxygen (O ₂), Carbon Dioxide (CO ₂), Nitrous Oxide (N ₂ O)	11 2
Carbon Monoxide (CO) Metal Carbonyls: Fe, Ni	Carbon Monoxide (CO)	Metal Carbonyls: Fe, Ni
Corrosives (HCI, HBr, CI ₂ , SiH ₂ CI ₂ , SiHCl ₃ , BCl ₃) < 1 ppb H ₂ O in inert gas	Corrosives (HCI, HBr, CI ₂ , SiH ₂ CI ₂ , SiHCI ₃ , BCI ₃)	
$< 100 \text{ ppb H}_2\text{O in HBr} \text{ LDL}$		< 100 ppb H ₂ O in HBr LDL
< 150 ppb H ₂ O in HCl		
Volatile Metals: Fe, Mo, Cr, Ni, Mn, Ti		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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