Gaskleen® ST Purifier

Description

A unique combination of Pall's leading edge AresKleen™ purification material combined with Ultramet-L® stainless steel filter media creating the industry's most advanced true point-of-use purifier.

The Gaskleen® ST Purifier assembly is designed to remove contamination from many process gases. Sub ppb level purification is achieved at designed flow rates of up to 5 slpm while providing 0.003 µm filtration.

- Controls and reduces impurities such as O_2, H_2O, CO_2, CO, NMHC, $Ni(CO)_4$ and $FE(CO)_5$
- One-for-one dimensional replacement of conventional in-line particle filter assemblies
- Assembly hardware is made of 316 L stainless steel
- High efficiency diffusion barrier ensures integrity of reactive material during installation
- Superior pressure drop characteristics
- Wide variety of gases purified
- 100% helium leak and pressure tested
- Compact size
- Not orientation sensitive
- Does not generate hazardous waste when used in non-hazardous gas service
- Will not release hydrocarbons
- No detectable metal contribution above background in HCl gas with HCLP material
- No detectable metal contribution above background in HBr gas with HBRP material

Specifications

Materials
- Electropolished 316 L VAR PLUS stainless steel components
- ≤ 0.25 µm / 10 µin R_a internal surface finish

Particle Removal Efficiency Rating
- $1x10^9$ retention of particles ≥ 0.003 nm up to 5 slpm

Connections
- 1/4" Gasket Seal, Male/Male (VCR[1] compatible)

Operating Conditions
- Maximum Operating Pressure: 2200 psig / 152 bar
- Maximum operating temperature: 100°C / 212°F (INP, SIP, FCP, SF6P), 40°C / 104°F (GEH4P, OXP, CLXP, HCLP, HBRP, CDAP)
- EU Pressure Equipment Directive: Assemblies have been evaluated and are CE marked per the European Union's Pressure Equipment Directive 2014/68/EU.

Design Flow Rate
- 0-5 slpm @ 15 psig / 1 bar
- Intermittent flow rates up to 10 slpm can be accommodated with reduced lifetime[2]

Packaging
- Double bagged
- Outer bag: aluminized mylar[3]
- Inner bag: polyethylene
- End fittings capped with metal seals
- Product packaged in an argon environment

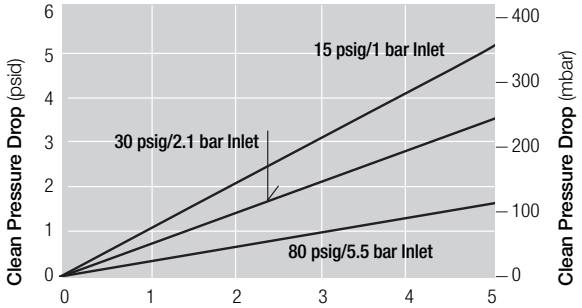
Nominal Dimensions
- Length: 5" / 127 mm
- Diameter: 1.25" / 31.8 mm

[1] VCR is a trademark of Swagelok Co.

[2] Contact the Pall Microelectronics Group for further information.

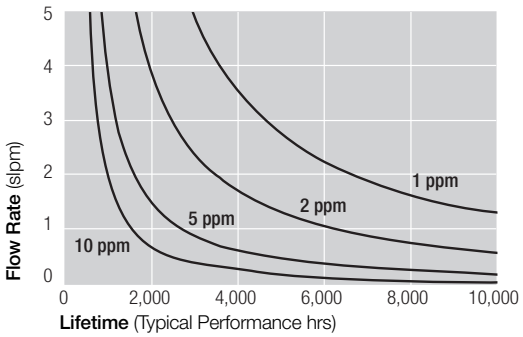
[3] Mylar is a registered trademark of Dupont Teijin Films.

Pressure Drop vs. Gas Flow Rate



Flow Rate (slpm) **Nitrogen 20˚C / 68˚F**
GLP5INPVMM4

Lifetime Calculations

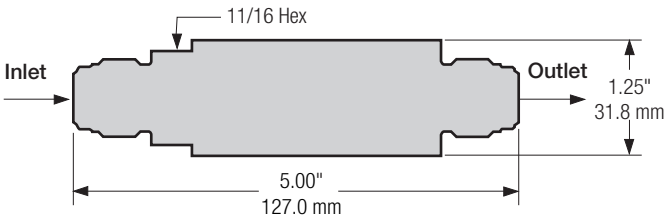


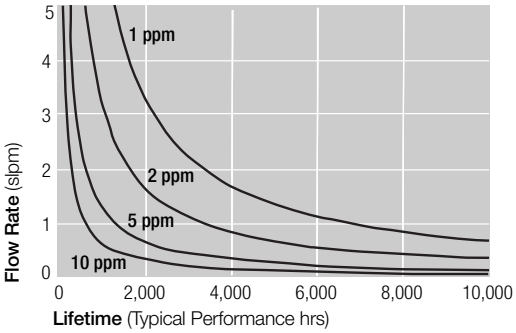
Lifetime (Typical Performance hrs)

Pall AresKleen Purification Material: Inert Gas Service Gaskleen ST Purifier Assembly, Part # GLP5INPVMM4

Inlet Pressure: 30 psig (2.1 bar) Contaminant Challenge as H_2O

Nominal Dimensions





Lifetime (Typical Performance hrs)

Pall AresKleen Purification Material: Inert Gas Service **Gaskleen ST Purifier Assembly, Part # GLP5INPVMM4**

Inlet Pressure: 30 psig (2.1 bar) Contaminant Challenge as O_2

Part Numbers / Ordering Information

Part Number Specifications	Specific Gas	Effluent Purity
GLP5INPVMM4	*Inert Gases:* Nitrogen, Argon, Helium, Xenon, Krypton, Neon	< 1 ppb H_2O, CO_2, O_2, CO
GLP5SIPVMM4	*Flammable Gases:* Silane, Hydrogen, Methane, Ethane, Cyclopropane, Propane, Dimethyl Ether	< 1 ppb H_2O, CO_2, O_2, CO
	Carbon Monoxide	< 1 ppb H_2O, O_2, CO_2, $Ni(CO)_4$, $Fe(CO)_5$
GLP5FCPVMM4	Fluoromethane, Difluoromethane, Trifluoromethane, Tetrafluoroethane, Pentafluoroethane, Heptafluoropropane, Carbon Tetrafluoride, Perfluoropropane, Perfluorocyclobutane, Hexafluoroethane	< 1 ppb H_2O, CO_2, O_2
GLP5GEH4PVMM4	Germane	< 1 ppb H_2O, CO_2, O_2, CO
GLP5SF6PVMM4	Sulfur Hexafluoride	< 1 ppb H_2O, CO_2, O_2, CO
GLP5OXPVMM4	*Oxygenated Gases:* Carbon Dioxide, Oxygen, Nitrous Oxide	< 10 ppb H_2O
GLP5CLXPVMM4	*Chlorinated Gases:* Boron Trichloride, Chlorine, Trichlorosilane, Dichlorosilane	< 100 ppb H_2O
GLP5HCLPVMM4	Hydrogen Chloride	< 15 ppb H_2O
GLP5HBRPVMM4	Hydrogen Bromide	< 50 ppb H_2O
GLP5CDAPVMM4	Photolithography clean dry air	< 1 ppb H_2O, < 300 ppt organics (as C_4), < 10 ppt acid gases (as SO_2), < 15 ppt basic gases (as NH_3), < 1 ppt refractory compounds (as HMDSO)

***Unit conversion:** 1 bar = 100 kilopascals

Technical Information

Impurity Removal as Tested in Specific Gases

Specific Gas	Impurity Removal Efficiency
Inert Gases: Nitrogen, Argon, Helium, Xenon, Krypton, Neon	< 1 ppb H_2O, CO_2, O_2, and CO as tested in argon and nitrogen using APIMS analyzer
Flammable Gases: Silane, Hydrogen, Methane, Ethane, Cyclopropane, Propane, Dimethyl Ether	< 1 ppb H_2O, CO_2, O_2, and CO as tested in argon, nitrogen and hydrogen using APIMS analyzer < 1 ppb H_2O as tested in carbon monoxide using trace moisture analyzer H_2O and siloxanes removed to trace levels as tested in silane using APIMS
Carbon Monoxide	< 1 ppb $Ni(CO)_4$, and < 1 ppb $Fe(CO)_5$ as tested in carbon monoxide using GC-ECD analyzer
Fluoromethane, Difluoromethane, Trifluoromethane, Tetrafluoroethane, Pentafluoroethane, Heptafluoropropane, Carbon Tetrafluoride, Perfluoropropane, Perfluorocyclobutane, Hexafluoroethane	< 1 ppb H_2O, CO_2, O_2, and CO as tested in argon and nitrogen using APIMS analyzer < 1 ppb O_2 as tested in trifluoromethane using trace oxygen analyzer < 10 ppb H_2O as tested in trifluoromethane using trace moisture analyzer and FTIR
Germane	< 1 ppb H_2O, CO_2, O_2, and CO as tested in argon and nitrogen using APIMS analyzer
Sulfur Hexafluoride	< 1 ppb H_2O, CO_2, and O_2 as tested in argon using APIMS
Oxygenated Gases: Carbon Dioxide, Oxygen, Nitrous Oxide, Clean Dry Air	< 10 ppb H_2O < 1 ppb H_2O, and CO_2, as tested in argon using APIMS analyzer
Chlorinated Gases: Boron Trichloride, Chlorine, Trichlorosilane, Dichlorosilane	< 100 ppb H_2O < 1 ppb H_2O, and CO_2, as tested in argon using APIMS analyzer
Hydrogen chloride	< 15 ppb H_2O as tested in hydrogen chloride using CRDS < 1 ppb H_2O as tested in argon using APIMS analyzer
Hydrogen Bromide	< 50 ppb H_2O as tested in hydrogen bromide using CRDS < 1 ppb H_2O as tested in argon using APIMS analyzer
Photolithography clean dry air	< 1 ppb H_2O as tested in argon using APIMS analyzer < 300 ppt C_4H_8 as tested in argon using APIMS Analyzer < 10 ppt SO_2 as tested in nitrogen using ion chromatograph < 15 ppt NH_3 as tested in nitrogen using ion chromatograph < 1 ppt HMDSO as tested in argon using APIMS analyzer and baseline subtraction

Unit conversion: 1 bar = 100 kilopascals

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