PALL Microelectronics

Mini Gaskleen® Gas Purifier

Description

Pall's Mini Gaskleen gas purifier is a true point-of use purifier. A unique combination of Pall's cutting-edge AresKleen™ purification material and Ultramet-L® stainless steel filter media, it is designed to remove contamination from many process gases. The purifier is capable of sub ppb level purification at designed flow rates of up to 1 splm, while providing 3 nm 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
- Purifies a wide variety of gases
- 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 ≥ 3 nm up to 2 slpm

Connections

- ¼ in Gasket seal, male / male (VCR[1] compatible)

Operating Conditions

- Maximum operating pressure: 20.7 MPa / 3,000 psig
- 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 designed using SEP per the European Union's Pressure Equipment Directive 2014/68/EU and are not CE marked

Design Flow Rate

- 0-1 slpm @ 0.1 MPa / 15 psig
- Higher intermittent flow rates of up to 2 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

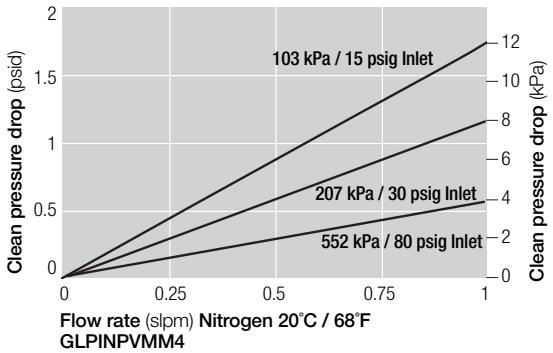
- Length: 84 mm / 3.31 in
- Diameter: 21.3 mm / 0.84 in

[1] VCR is a trademark of Swagelok Company

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

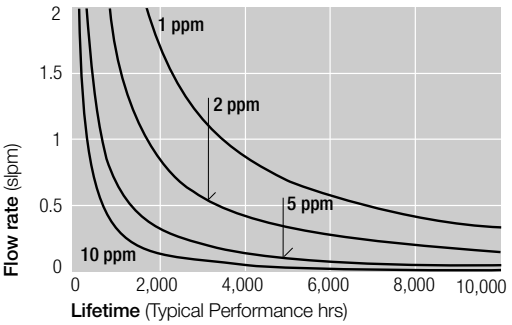
[3] Mylar is a registered trademark of Dupont Teijin Films.

Pressure Drop vs. Gas Flow Rate



Flow rate (slpm) **Nitrogen 20˚C / 68˚F**
GLPINPVMM4

Lifetime Calculations

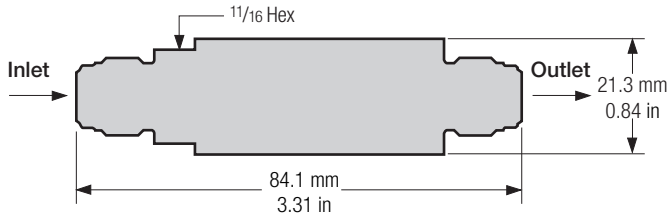


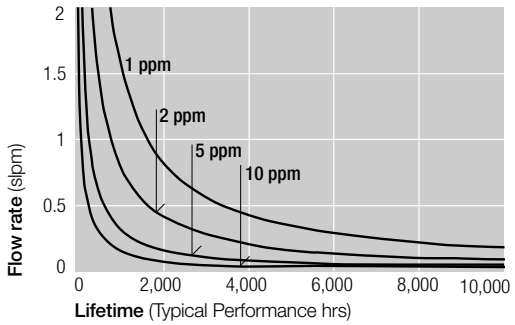
Lifetime (Typical Performance hrs)

Pall AresKleen purification material: Inert gas service
Mini Gaskleen purifier assembly, part # GLPINPVMM4

Inlet pressure: 207 kPa (30 psig) contaminant challenge as H_2O

Nominal Dimensions





Lifetime (Typical Performance hrs)

Pall AresKleen purification material: Inert gas service
Mini-Gaskleen purifier assembly, part # GLPINPVMM4

Inlet pressure: 207 kPa (30 psig) contaminant challenge as O_2

Part Numbers / Ordering Information

Part Number	Specific Gas	Effluent Purity Specifications
GLPINPVMM4	Inert gases: Nitrogen, argon, helium, xenon, krypton, neon	< 1 ppb H_2O, O_2, CO_2, CO
GLPSIPVMM4	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, $Ni(CO)_4$, $Fe(CO)_5$
GLPFCPVMM4	Fluoromethane, difluoromethane, trifluoromethane, tetrafluoroethane, pentafluoroethane, heptafluoropropane, carbon tetrafluoride, perfluoropropane, perfluorocyclobutane, hexafluoroethane	< 1 ppb H_2O, CO_2, O_2
GLPGEH4PVMM4	Germane	< 1 ppb H_2O, CO_2, O_2, CO
GLPSF6PVMM4	Sulfur hexafluoride	< 1 ppb H_2O, CO_2, O_2, CO
GLPOXPVMM4	Oxygenated gases: Carbon dioxide, oxygen, nitrous oxide	< 10 ppb H_2O
GLPCLXPVMM4	Chlorinated gases: Boron trichloride, chlorine, trichlorosilane, dichlorosilane	< 100 ppb H_2O
GLPHCLPVMM4	Hydrogen chloride	< 15 ppb H_2O
GLPHBRPVMM4	Hydrogen bromide	< 50 ppb H_2O
GLPCDAPVMM4	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

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