



PG Series Gaskleen® Purifier Assemblies and Manifolds

Description

Pall's Gaskleen® PG purifier assemblies have been designed to handle process flow rates up to 1,000 slpm.

- An optional bypass manifold is available complete with isolation valves and backplate for easy mounting.
- Pall's purification materials are available in every standard configuration.
- All purifier assemblies contain an integral 316L stainless steel particle filter.
- 100% helium leak and pressure tested.
- 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

Assembly Flow Rates

- PG550: 75 slpm
- PG2400: 500 slpm
- PG11000: 1,000 slpm



Particle Filter Options

- PG550/PG2400: 0.4 μm or 0.003 μm
- PG11000: 0.4 μm

Connections

- $\frac{1}{4}$ in or $\frac{1}{2}$ in gasket seal (VCR¹ or compatible) male/male
- Inlet/outlet isolation valves (for PG11000)

Assembly Material

- Electropolished 316L SS
- <0.25 μm / $<10 \mu\text{in}$ Ra internal surface finish



Operating Conditions

- Maximum operating pressure
PG550/PG2400: 3.45 MPa/500 psig
PG11000: 1.72 MPa/250 psig
- Maximum operating temperature:
100°C/212°F (INP, SIP, FCP, SF6P),
40°C/104°F (NH3P, GEH4P, OXP,
CLXP, HCLP, HBRP, CDAP)
- EU Pressure Equipment Directive:
Assemblies have been evaluated for compliance with the European Union's Pressure Equipment Directive 97/23/EC and are CE-marked.

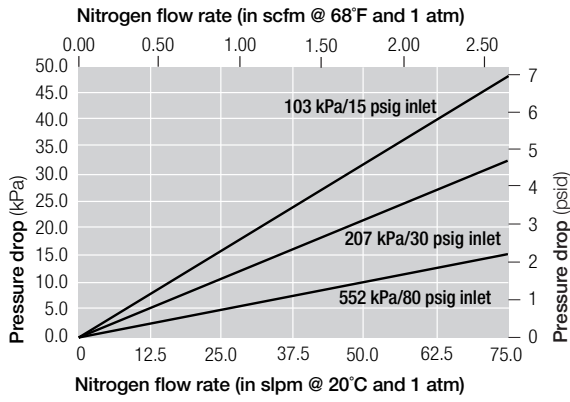
¹ VCR is a trademark of Swagelok Co.

List of Purifiable Gases

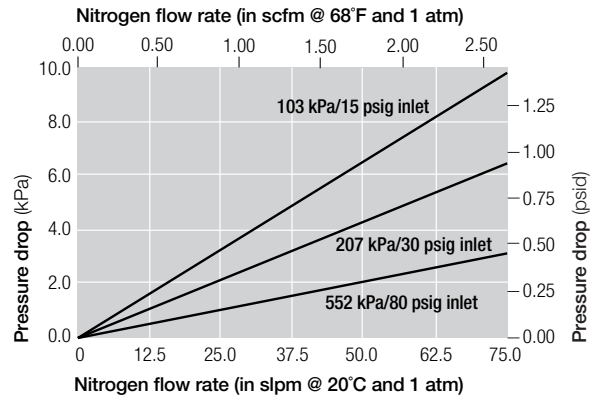
Gas Family	Material	Effluent Specification ²
Nitrogen, argon, helium, xenon, krypton, neon	INP	<1 ppb H ₂ O, O ₂ , CO ₂ and CO
Silane, hydrogen, methane, cyclopropane, propane, dimethyl ether	SIP	<1 ppb H ₂ O, O ₂ , CO ₂ and CO
Carbon monoxide	SIP	<1 ppb H ₂ O, O ₂ , CO ₂ , Ni(CO) ₄ , and Fe(CO) ₅
Fluoromethane, difluoromethane, trifluorine, tetrafluoroethane, pentafluoroethane, heptafluoropropane, carbon tetrafluoride, perfluoropropane, perfluorocyclobutane, hexafluoroethane	FCP	<1 ppb H ₂ O, O ₂ , CO ₂ and CO
Ammonia	NH3P	<1 ppb H ₂ O, O ₂ , CO ₂ and CO
Germane	GEH4P	<1 ppb H ₂ O, O ₂ , CO ₂ and CO
Sulfur hexafluoride	SF6P	<1 ppb H ₂ O, O ₂ , CO ₂ and CO
Air, carbon dioxide, oxygen, nitrous oxide	OXP	<10 ppb H ₂ O
Boron trichloride, chlorine, trichlorosilane, dichlorosilane	CLXP	<100 ppb H ₂ O
Hydrogen chloride	HCLP	<15 ppb H ₂ O
Hydrogen bromide	HBRP	< 50 ppb H ₂ O
Photolithography clean dry air	CDAP	< 1 ppb H ₂ O, < 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)

² As tested in inert gas.

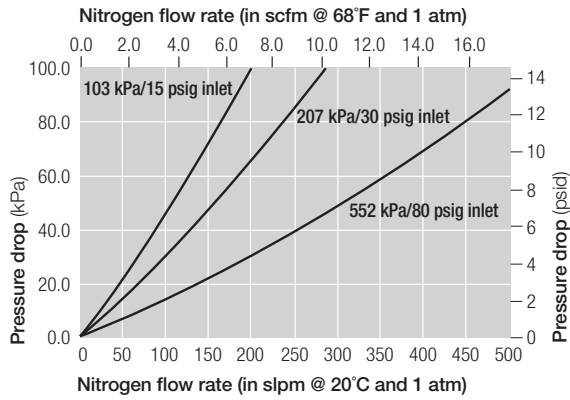
Pressure Drop vs. Gas Flow Rate



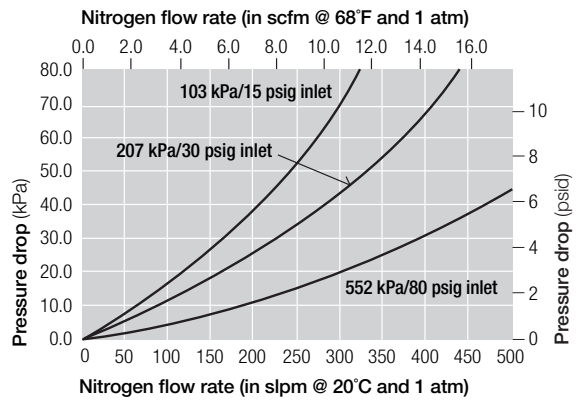
PG550 with 0.003 µm filter



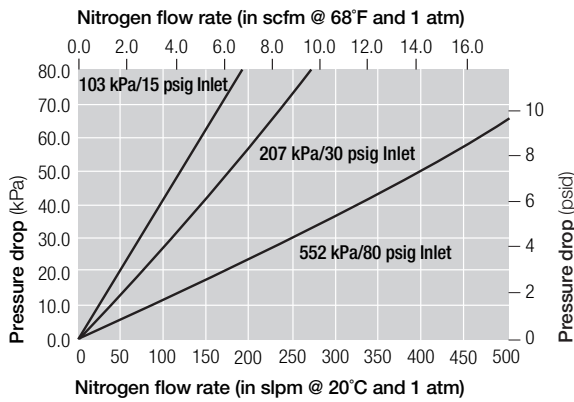
PG550 with 0.4 µm filter



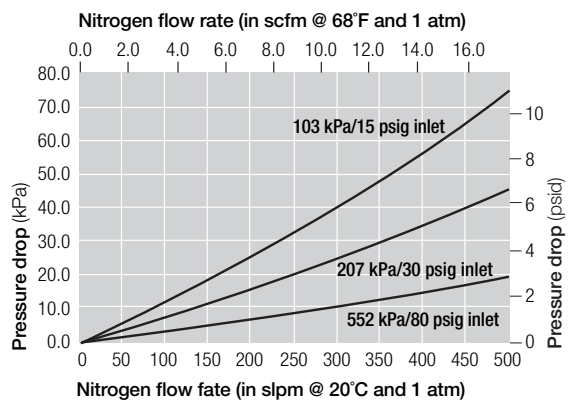
PG2400 VMM4 with 0.003 µm filter



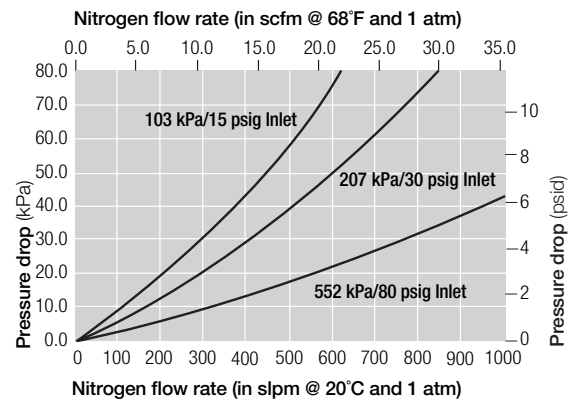
PG2400 VMM4 with 0.4 µm filter



PG2400 VMM8 with 0.003 µm filter



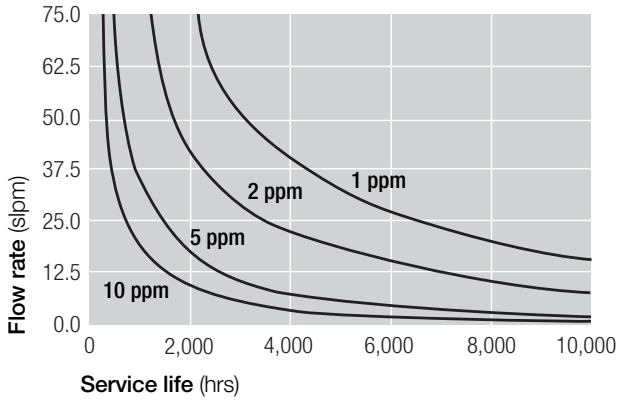
PG2400 VMM8 with 0.4 µm filter



PG11000 Series assembly

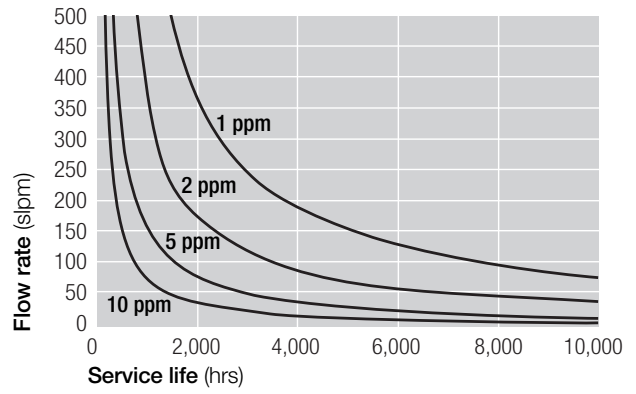
Note: For pressure drop information for a specific application, please contact Pall Microelectronics.

Lifetime Calculations



Pall AresKleen™ purification material: inert gas service
Gaskleen® PG550 purifier assembly, part # GLP9INPVMM4

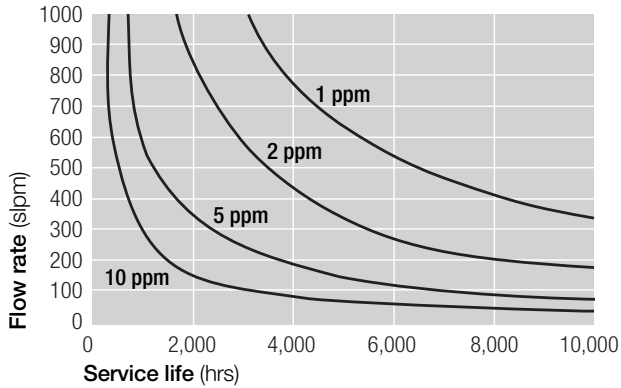
Inlet pressure: 207 kPa (30 psig) contaminant challenge as H₂O



Pall AresKleen™ purification material: inert gas service
Gaskleen® PG2400 purifier assembly, part # GLP24INPVMM4/VMM8

Inlet pressure: 207 kPa (30 psig) contaminant challenge as H₂O

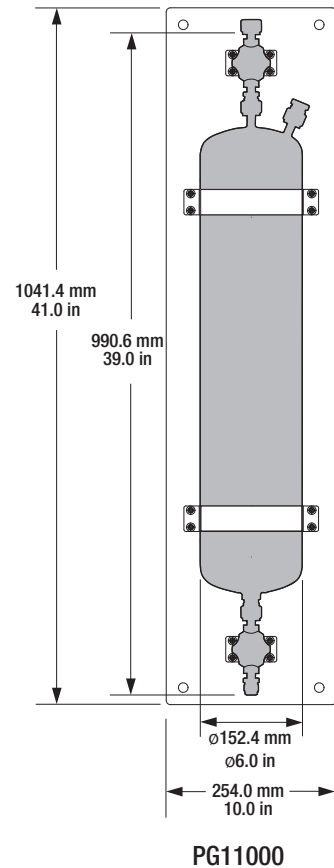
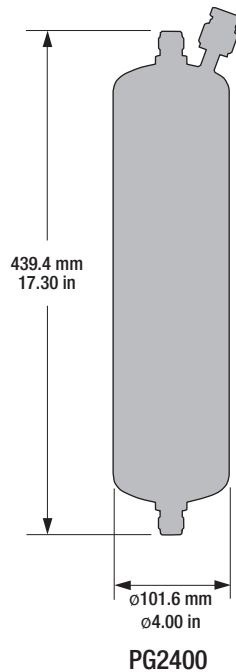
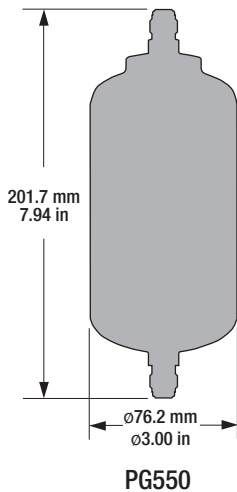
Note: For lifetime calculations in a specific application, please contact Pall Microelectronics.



Pall AresKleen™ purification material: inert gas service
Gaskleen® PG11000 purifier assembly, part # GLP110INPVFM8

Inlet pressure: 207 kPa (30 psig) contaminant challenge as H₂O

Nominal Assembly Dimensions



Note: For manifold dimensions, please contact Pall Corporation.

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 ₂ O, 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 ₂ O, CO ₂ , O ₂ , and CO, as tested in argon, nitrogen and hydrogen using APIMS analyzer <1 ppb H ₂ O, as tested in carbon monoxide using trace moisture analyzer H ₂ O 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
Ammonia	<1 ppb H ₂ O, CO ₂ , and O ₂ , as tested in argon using APIMS <12 ppb H ₂ O, as tested in ammonia using NIR-TDLAS Removal of O ₂ and CO ₂ to trace levels, as tested in ammonia using GC-DID
Fluorocarbons: fluoromethane, difluoromethane, trifluoromethane, tetrafluoroethane, pentafluoroethane, heptafluoropropane, carbon tetrafluoride, perfluoropropane, perfluorocyclobutane, hexafluoroethane	<1 ppb H ₂ O, 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 ₂ O, as tested in trifluoromethane using trace moisture analyzer and FTIR
Germane	<1 ppb H ₂ O, CO ₂ , O ₂ , and CO, as tested in argon and nitrogen using APIMS analyzer
Sulfur hexafluoride	<1 ppb H ₂ O, CO ₂ , and O ₂ , as tested in argon using APIMS
Oxygenated gases: carbon dioxide, oxygen, nitrous oxide, clean dry air	<10 ppb H ₂ O <1 ppb H ₂ O, and CO ₂ , as tested in argon using APIMS analyzer
Chlorinated gases: boron trichloride, chlorine, trichlorosilane, dichlorosilane	<100 ppb H ₂ O <1 ppb H ₂ O, and CO ₂ , as tested in argon using APIMS analyzer
Halogenated gases: hydrogen chloride, hydrogen bromide	< 15 ppb H ₂ O as tested in hydrogen chloride using CRDS < 50 ppb H ₂ O as tested in hydrogen bromide using CRDS < 1 ppb H ₂ O as tested in argon using APIMS analyzer
Photolithography clean dry air	< 1 ppb H ₂ O as tested in argon using APIMS analyzer < 300 ppt C ₄ H 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

Part Numbers / Ordering Information

Series	Part Number ³	Description
PG550	GLP9xxxxFVMM4	Purifier assembly, 75 slpm, 0.003 µm filter, ¼ in gasket seal (VCR or compatible) male/male
	GLP9xxxxFMAN	Bypass manifold with GLP9xxxFVMM4 assembly
	GLP9xxxxFVMM4GCMAN	Gas cabinet manifold with GLP9xxxFVMM4 assembly
	GLP9xxxxVMM4	Purifier assembly, 75 slpm, 0.4 µm filter, ¼ in gasket seal (VCR or compatible) male/male
	GLP9xxxxMAN	Bypass manifold with GLP9xxxVMM4 assembly
	GLP9xxxxVMM4GCMAN	Gas cabinet manifold with GLP9xxxVMM4 assembly
PG2400	GLP24xxxxFVMM4	Purifier assembly, 300 slpm, 0.003 µm filter, ¼ in gasket seal (VCR or compatible) male/male
	GLP24xxxxFVMM8	Purifier assembly, 300 slpm, 0.003 µm filter, ½ in gasket seal (VCR or compatible) male/male
	GLP24xxxxFMAN	Bypass manifold with GLP24xxxxFVMM8 assembly
	GLP24xxxxVMM4	Purifier assembly, 500 slpm, 0.4 µm filter, ¼ in gasket seal (VCR or compatible) male/male
	GLP24xxxxVMM8	Purifier assembly, 500 slpm, 0.4 µm filter, ½ in gasket seal (VCR or compatible) male/male
	GLP24xxxxMAN	Bypass manifold with GLP24xxxxVMM8 assembly
PG11000	GLP110xxxxVFM8 ⁴	Purifier assembly, 1,000 slpm, 0.4 µm filter, ½ in gasket seal (VCR or compatible) female inlet/male outlet
	GLP110xxxxMAN ⁴	Bypass manifold with GLP110xxxVMM8 assembly

³ See list of purifiable gases on page 1. Example: GLP9INPFVMM4.

⁴ The PG11000 stainless steel assembly (used with all GLP110 part numbers) is fabricated in accordance with the ASME BPVC Section VIII, Division 1, and has a U-stamp. If the user determines that an L-stamp is required for a lethal service application, please contact Pall Microelectronics for cost and availability.



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