PALL Microelectronics

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

- ¼ in or ½ in gasket seal (VCR[1] or compatible) male/male
- Inlet/outlet isolation valves (for PG11000)

Assembly Material

- Electropolished 316L SS
- <0.25 µm/<10 µin 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 (GEH4P, OXP, CLXP, HCLP, HBRP, CDAP)
- EU Pressure Equipment Directive: Assemblies have been evaluated for compliance with the European Union's Pressure Equipment Directive 2014/68/EU and are CE-marked.

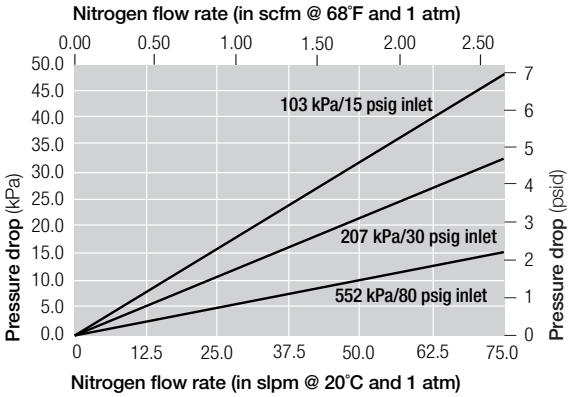
[1] VCR is a trademark of Swagelok Co.

List of Purifiable Gases

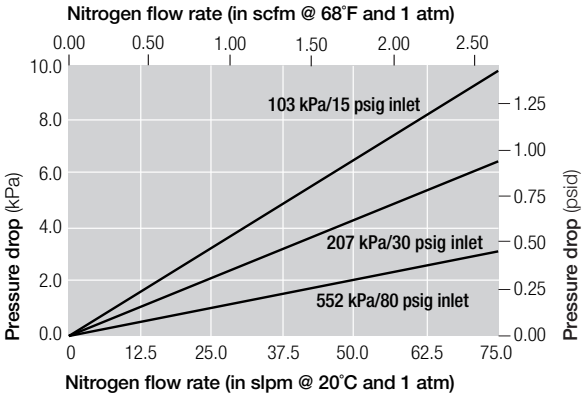
Gas Family	Material	Effluent Specification[2]
Nitrogen, argon, helium, xenon, krypton, neon	INP	<1 ppb H_2O, O_2, CO_2 and CO
Silane, hydrogen, methane, cyclopropane, propane, dimethyl ether	SIP	<1 ppb H_2O, O_2, CO_2 and CO
Carbon monoxide	SIP	<1 ppb H_2O, O_2, CO_2, $Ni(CO)_4$, and $Fe(CO)_5$
Fluoromethane, difluoromethane, trifluorine, tetrafluoroethane, pentafluoroethane, heptafluoropropane, carbon tetrafluoride, perfluoropropane, perfluorocyclobutane, hexafluoroethane	FCP	<1 ppb H_2O, O_2, CO_2 and CO
Germane	GEH4P	<1 ppb H_2O, O_2, CO_2 and CO
Sulfur hexafluoride	SF6P	<1 ppb H_2O, O_2, CO_2 and CO
Air, carbon dioxide, oxygen, nitrous oxide	OXP	<10 ppb H_2O
Boron trichloride, chlorine, trichlorosilane, dichlorosilane	CLXP	<100 ppb H_2O
Hydrogen chloride	HCLP	<15 ppb H_2O
Hydrogen bromide	HBRP	< 50 ppb H_2O
Photolithography clean dry air	CDAP	< 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)

[2] As tested in inert gas.

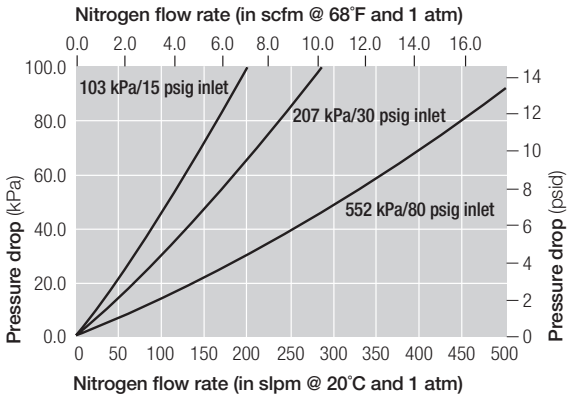
Pressure Drop vs. Gas Flow Rate



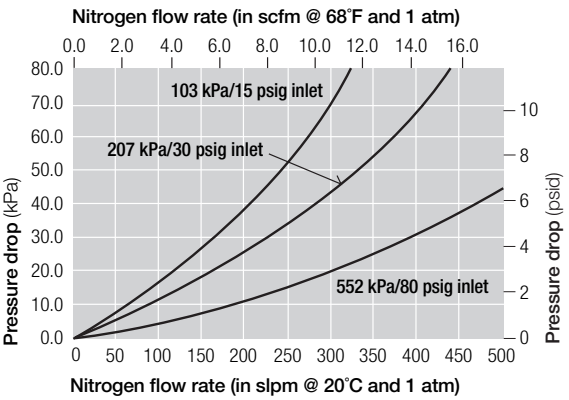
PG550 with 0.003 µm filter



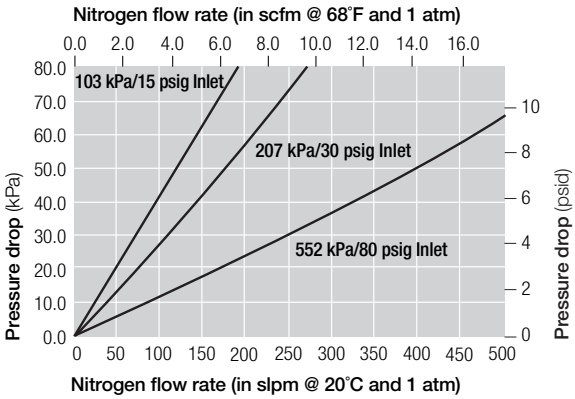
PG550 with 0.4 µm filter



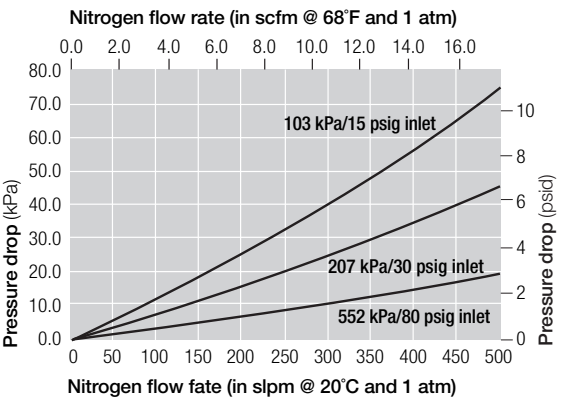
PG2400___VMM4 with 0.003 µm filter



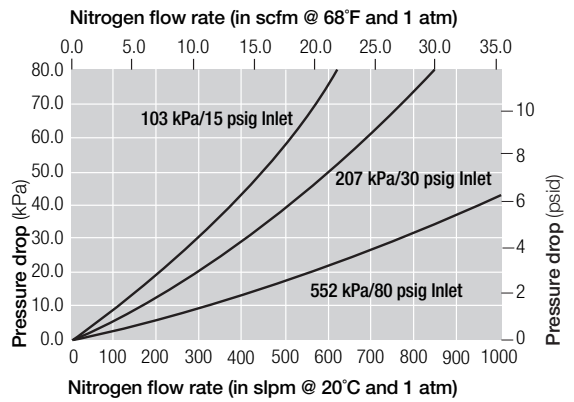
PG2400___VMM4 with 0.4 µm filter



PG2400___VMM8 with 0.003 µm filter



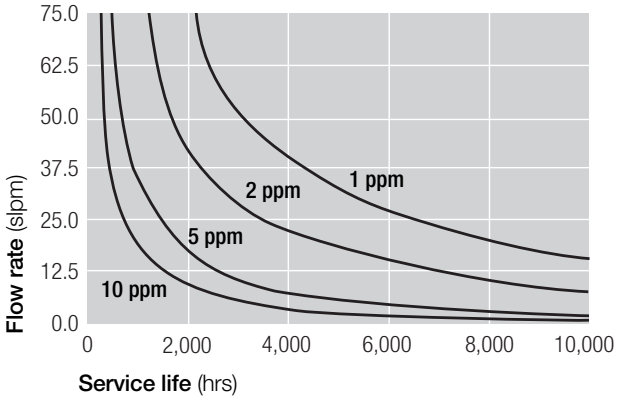
PG2400___VMM8 with 0.4 µm filter



PG11000 Series assembly

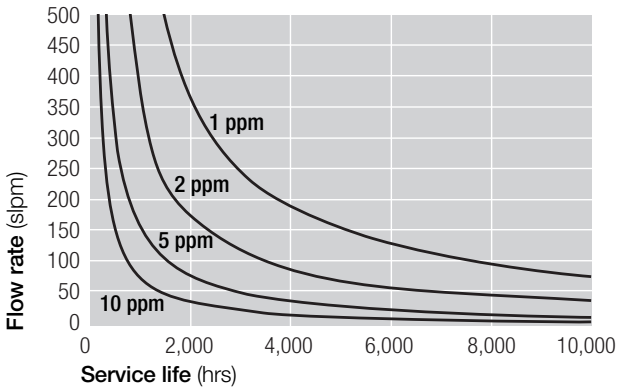
Note: For pressure drop information for a specific application, please contact Pall Microelectronics.

Lifetime Calculations



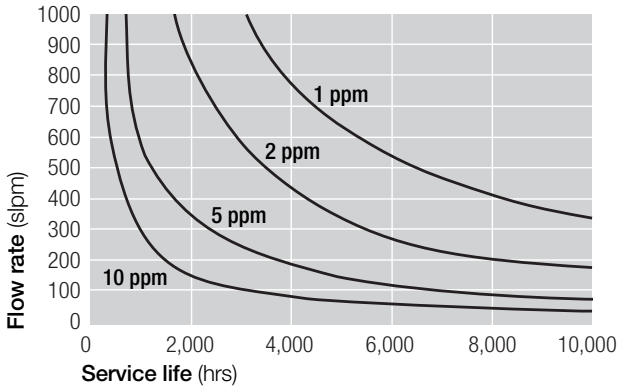
Pall AresKleen™ purification material: inert gas service
Gaskleen® PG550 purifier assembly, part # GLP9INPVMM4

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



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

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

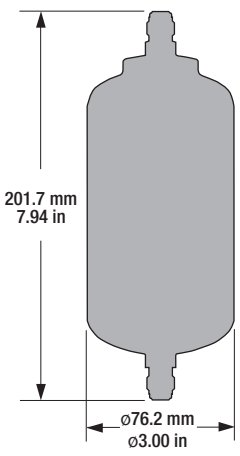


Pall AresKleen™ purification material: inert gas service
Gaskleen® PG11000 purifier assembly, part # GLP110INPVFM8

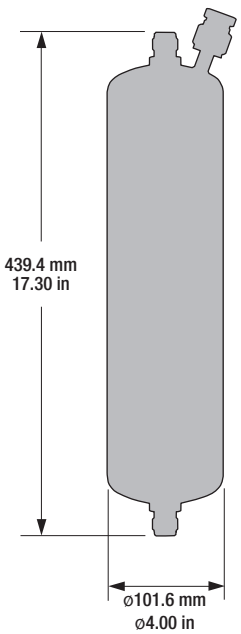
Inlet pressure: 207 kPa (30 psig) contaminant challenge as H_2O

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

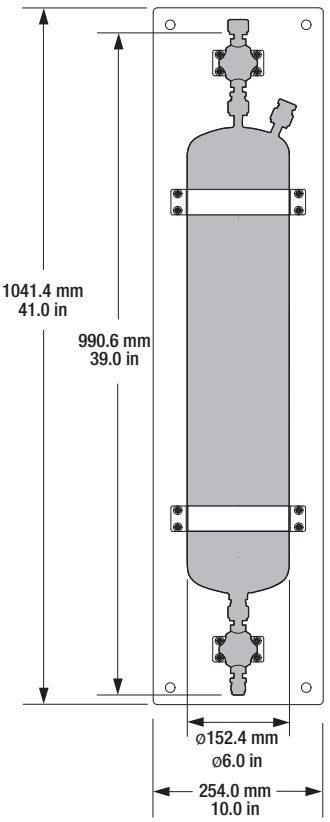
Nominal Assembly Dimensions



PG550



PG2400



PG11000

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_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
Fluorocarbons: 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
Halogenated gases: hydrogen chloride, hydrogen bromide	< 15 ppb H_2O as tested in hydrogen chloride using CRDS < 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

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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