Agilent
Trusted Answers

Instructions for use

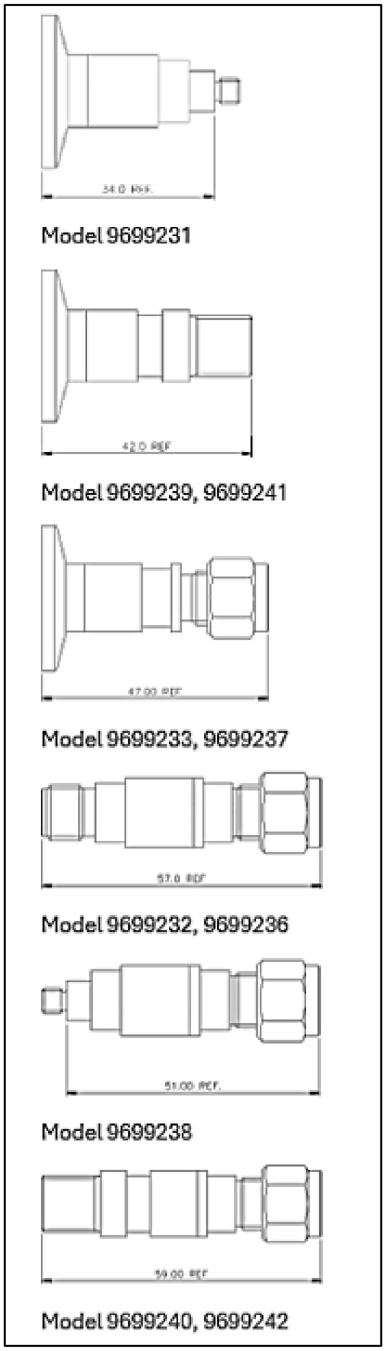
Agilent Gas Purge Valve

Product Name	Small Leak	Large Leak
KF16-M5 10 sccm at 1 bar Valve	9699231	
10 sccm at 1bar Swagelock valve	9699232	
10 sccm KF16 Swagelock Valve	9699233	
20 sccm at 1bar Swagelock Valve		9699236
KF16- Swagelock 20 sccm 1bar valve		9699237
Swagelock-M5 20 sccm at 1bar Valve		9699238
10 sccm KF16-M12 Valve	9699239	
10 sccm Swagelock-M12 Valve	9699240	
20 sccm KF16-M12 Valve		9699241
20 sccm Swagelock-M12 Valve		9699242

1. General

The gas purge valve is a protection device to protect the pump bearings against particulate and corrosive gases that could move into the pump. This device is available with:
- Small leak
- Large leak.

Both versions are available with six different fitting combinations for a total of 10 different models (see figure 1).
Every valve is made with a thin calibrate sapphire orifice mounted into a cartridge, with two special PTFE membranes on each tube side. This is to avoid any particulate, powder and any liquid to come into and occlude the thin hole.
The pieces are mounted altogether into a SST leak tight body.



Model 9699231

Model 9699239, 9699241

Model 9699233, 9699237

Model 9699232, 9699236

Model 9699238

Model 9699240, 9699242

Fig. 1 – Gas Purge Valve Models

2. Gas Purge Valve Characteristics

Each version of the valve is suited for a particular application:

- the small leak (~ 10 sccm at 1000 mbar) for mild corrosive operation when the partial pressure of the corrosive gas is maximum 10^{-5} mbar (analytical instruments, ion implanters);
- the large leak (~ 20 sccm at 1000 mbar) for heavy corrosive operations (etching, CVD), when the partial pressure of the corrosive gas is $>10^{-5}$ mbar.

If you wish to use a different flowrate, you might change the supply pressure. For a given supply pressure value, the gas purge valve can give you a fixed flowrate value.
Please note that the flow amount does not depend on the vacuum side pressure of the valve if the pressure is lower than ~ 0.5 of the supply pressure.
Refers to the following diagrams to find the precise correlation. These diagrams refer to dry nitrogen and argon, for other gases you may correct the flowrate according to the calibration factor:

$$fx = \sqrt{\frac{M_x}{M_{N2}}}$$

where:

- M_{N2} is the molecular weight of Nitrogen
- M_x is the molecular weight of the other gas.

For example the gas purge flow rate for 1000 mbar
of Ar for the single tube valve is:

$$Q \approx Q_{N2} \bullet fAr = Q_{N2} \bullet \sqrt{\frac{28}{40}}$$

where Q_{N2} is the corresponding nitrogen flowrate at 1000 mbar.

3. Operation Notes

Always use no less than Agilent minimum suggested purge flow rates to properly purge the pump (see the relevant pump manual). Please note that you can use all the purging flows between the minimum specified into the instruction manual and 3500 sccm, if your system is able to pump and withstand higher flow-rates.
Always operate the pump with gas purge on: during pump running, during stops, even if corrosive gases were not flowing. This provides protection against particulates that could move into the pump.
Non-observation of these basic, simple rules could affect pump warranty.

NOTE The Soft start is recommended for the installation of the pump and may be disabled when the is continuously operated and the interval between different run is not more than 1 week.

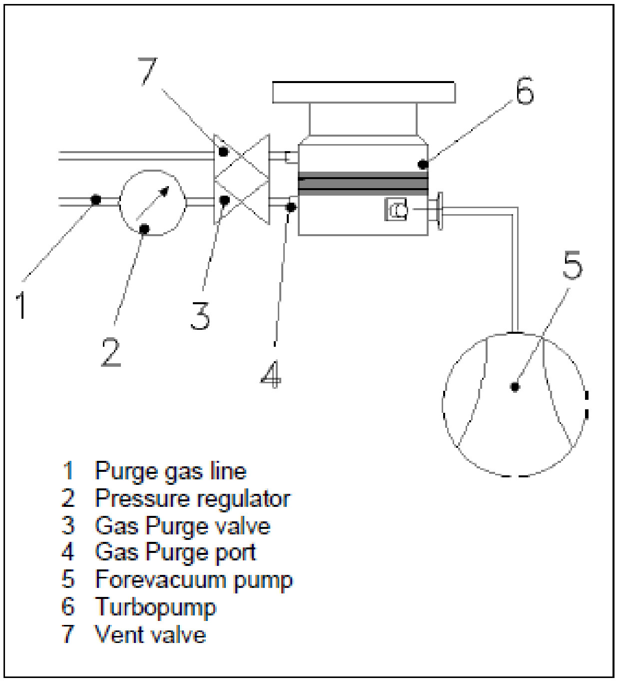


Fig. 2 - Installation diagram

4. Vent Procedure

Venting may be done in three different ways:

- Through the vent port (using vent valve or vent device).
  In this case the only precaution required is to keep the gas purge port on even during vent procedure.

- Through the gas purge port
  The maximum air flow allowed for venting through the gas purge port is 3500 sccm (58.3 mbarl/sec). If the required flow for venting the turbopump is higher than the flow allowed by the gas purge valve, a "T" connector can be put on the purge port.
  On one side is connected the vent valve, and on the other side is connected the gas purge valve.

CAUTION When venting is performed through the gas purge port, be sure that the foreline pump is on, to avoid overpressure.

- Through the chamber

  The vent flow rate into the chamber must be less than three times the chamber volume (in liters) multiplied by the flow rate through the gas purge port. This is done to maintain the pressure into the pump body higher than into the chamber to avoid any corrosive or powder flowback.

  E.g. **chamber volume**: 250 liters;
  gas purge flow: 20 sccm (0.33 mbar l/sec)

  chamber venting flow rate = 3x250x20 = 15000 sccm

  and the venting time will be:

  chamber venting =
  = (chamber volumex1000)/chamber flow rate=
  = (250 x 1000)/15000 = 17 min.

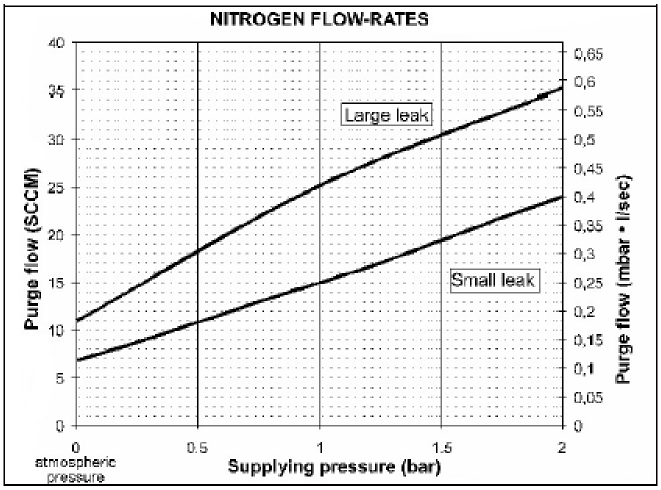


Fig. 4 - Gas Purge Valve flow rate vs supplying pressure for Nitrogen

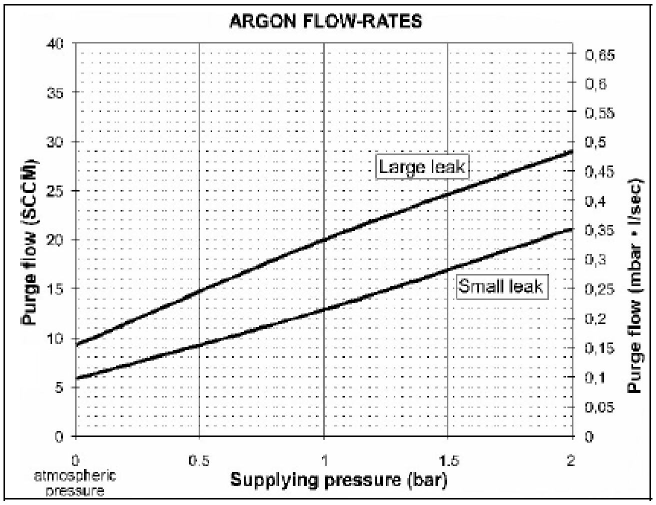


Fig. 5 - Gas purge Valve flow rate vs supplying pressure for Argon

Disposal

The following symbol is applied in accordance with the EC WEEE (Waste Electrical and Electronic Equipment) Directive. This symbol (valid only in countries of the European Community) indicates that the product it applies to must NOT be disposed of together with ordinary domestic or industrial waste but must be sent to a differentiated waste collection system. The end user is therefore invited to contact the supplier of the device, whether the Parent Company or a retailer, to initiate the collection and disposal process after checking the contractual terms and conditions of sale.

For more information refer to:
http://www.agilent.com/environment/product/index.shtml

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