

PGC utility consumptions

PGC5000 process gas chromatographs



Utility specifications for the PGC5000 series.

Measurement made easy

PGC5000 process gas chromatographs

Instrument air

Instrument air is used for the purge of the electronics housings, the oven heater and to operate the chromatography valves. Normally instrument air should be oil free with a dew point of -40°C (-40°F). However, if instrument air is used to supply FID Burner air (see below) via an air clean-up unit, then the Total Hydrocarbons should be less than 100 ppm and Methane less than 10ppm.

Burner air

Air to support Flame Ionization Detector's (FID) may be supplied either by an air clean-up unit or from cylinders. Cylinder air should be of ISA Hydrocarbon Free Grade (breathing quality) with hydrocarbon content <1 ppm and dew point less than -40°C (-40°F). In addition, cylinder air may be used for Flame Photometric Detector (FPD) support. Air clean-up units are not suitable for use with FPD's since they convert the hydrocarbons in the air to carbon dioxide and water, which is detrimental to the FPD.

Carrier gases

The most commonly used carrier gases are hydrogen, nitrogen and helium. For FPDs only, air can be used in specific applications. The required purity of these gases varies with the application; the

lower the levels of components being measured, the higher the carrier gas purity necessary. Other factors affect the purity required; for example, molecular sieve columns are de-activated by carbon dioxide and water.

Thermal Conductivity Detector (TCD)

For percent level measurements gases of 99.99% purity are generally suitable. The purity requirement increases to 99.995% for ppm measurement ranges.

Flame Ionization Detector (FID)

Gases for this detector should be 99.995% pure for most measurements down to around 5ppm. Below this range 99.9995% pure gases should be used. The measurement of carbon dioxide and carbon monoxide at levels less than 20 ppm with a methanizer is a special case. For this application gases of 99.9995% purity are required, specifically with impurity levels of carbon monoxide and carbon dioxide less than 0.5 ppm and 0.1ppm respectively.

Flame Photometric Detector (FPD)

This detector is specific to Sulphur compounds, which are not normally present as impurities in cylinder gases. The most critical factor is the moisture content of the gases, so zero grade air cylinders should be used.

PGC utility consumptions

PGC5000B, PGC5000C, PGC5007, PGC5009
and temperature programmed

Specification

Capillary columns

For capillary columns, regardless of the type of detector, 99.995% pure gases should normally be used.

Power

Hot, Neutral, Ground

Voltage

100 V AC $\pm 10\%$

120 V AC $\pm 10\%$

230 V AC $\pm 10\%$

Frequency:

50/60 Hz $\pm 10\%$

Power consumption

PGC5000B

1200 VA startup

900 VA steady-state operation

PGC5000C

1600 VA startup

1200 VA steady-state operation

PGC5007

1200 VA maximum

900 VA typical

Typical, varies with installed options

PGC5009

1200 VA maximum

240 VA typical

PGC5000 temperature programmed

1900 VA maximum startup

1000 VA steady state

Instrument air

Supply pressure

PGC5000, PGC5007, PGC5009

414 kPa (60 psig) minimum

Flow rates

PGC5000, PGC5007

Start-up purge

214 to 242 l/min

(7.6 to 8.6 ft³/min) at 20 °C (68 °F), all purge types

Steady state purge

127 to 147 l/min

(4.5 to 5.2 ft³/min) at 20 °C (68 °F), all purge types

PGC5009

Start-up

243.56 l/min (8.6 ft³/min)

PGC5000 temperature programmed

Start-up

378 l/min (13.4 ft³/min)

Airless

Class I, Div. 2: 0 l/min (0 ft³/min)

IEC/ATEX Zone 2: 0 l/min (0 ft³/min)

Class I, Div 1: 14 l/min (0.5 ft³/min)

IEC/ATEX Zone 1: 14 l/min (0.5 ft³/min)

Carrier and detector gas flow rates

TCD

	Gas valves Packed column	Liquid inject valves Packed column
Analytical	30 to 45 cc/min per valve	30 to 45 cc/min per valve
Backflush	45 to 60 cc/min per valve	45 to 60 cc/min per valve
Reference	20 to 30 cc/min detector	20 to 30 cc/min detector
	Capillary column	Capillary column
Analytical	5 to 20 cc/min per valve	5 to 20 cc/min per valve
Backflush	10 to 30 cc/min per valve	10 to 30 cc/min per valve
Reference	10 to 20 cc/min detector	10 to 20 cc/min per valve
Splitter	50 to 150 cc/min each	50 to 150 cc/min each

FID (Dilution gas and/or burner fuel is often the carrier gas for FID)

	Gas valves Packed column	Liquid inject valves Packed column
Analytical	30 to 45 cc/min per valve	30 to 45 cc/min per valve
Backflush	45 to 60 cc/min per valve	45 to 60 cc/min per valve
Burner fuel	30 to 45 cc/min detector	30 to 45 cc/min detector
Dilution gas	30 to 45 cc/min detector	30 to 45 cc/min detector
Burner air	300 to 450 cc/min detector	300 to 450 cc/min detector
Splitter	50 to 300 cc/min each	50 to 300 cc/min each
	Capillary column	Capillary column
Analytical	5 to 20 cc/min per valve	5 to 20 cc/min per valve
Backflush	10 to 30 cc/min per valve	10 to 30 cc/min per valve
Splitter	10 to 20 cc/min detector	10 to 20 cc/min detector
Burner fuel	50 to 150 cc/min each	50 to 150 cc/min each
Dilution gas	30 to 35 cc/min detector	30 to 35 cc/min detector
Burner air	300 to 450 cc/min detector	300 to 450 cc/min detector

FPD (in most cases the carrier is the burner fuel for FPD)

	Gas valves Packed column	Liquid inject valves Packed column
Analytical	30 to 45 cc/min per valve	30 to 45 cc/min per valve
Backflush	45 to 60 cc/min per valve	45 to 60 cc/min per valve
Burner fuel	30 to 45 cc/min detector	30 to 45 cc/min detector
Burner air	60 to 100 cc/min per detector	60 to 100 cc/min per detector
Splitter	50 to 300 cc/min each	50 to 300 cc/min each

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