



## RARE GAS PURIFIER MODEL MP-2000

**The ideal purifier for purifying argon or helium. Proven record of reliability. Thousands of units in use world-wide. The purifier of choice for spark and plasma emission spectroscopy.**

### **New product news**

The MP2000 is now upgraded with new electronics and a new optional pressure sensor. The upgraded model will be available from about March 2009. The updated electronics uses the latest surface mount components and a microcontroller to give improved functionality

### **Overview of the MP2000**

Sircal introduced the MP-2000 in the year 2000 to replace the existing model which had built up a reputation of reliability and cost-effectiveness. The MP-2000 is a stand-alone unit for the purification of argon or any of the other rare gases: helium, neon, xenon and krypton. It offers a compact system for delivery of purified gas directly to the point of use. The purifier contains two reactive getter tubes and a molecular sieve drier tube housed in a cabinet for immediate use. Just plug into the local ac power supply, connect the gas and purge the lines, turn on the power and you are up and running.

The MP-2000 design introduced several new features and benefits. From time to time the user has to replace the getter tubes and the molecular sieve drier tube when they become exhausted. The MP-2000 design is aimed at making this operation much quicker than before. The getter tubes can be removed from the purifier through the top of the enclosure by simply undoing a couple of gas connections. The drier tube is equally easy to remove from the front of the enclosure. The entire tube replacement procedure is simplified and reduced in time by a factor of 10 compared with the previous model.

For flow rates up to 10 litres per minute and inlet pressures up to 250 psig (17 bar), the MP-2000 will remove the impurities, i.e. oxygen, nitrogen, hydrogen, carbon monoxide, hydrocarbons, carbon dioxide and moisture (typically present in the range of 30-50vpm) in commercially available rare gases down to a concentration of less than 1 vpm in total.

The MP-2000 has been designed on a modular basis to simplify servicing and maintenance. All parts are available on a quick delivery basis either direct from SIRCAL or from your local agent.



With over 18 years experience in supplying rare gas purifiers throughout the world SIRCAL has built up a fine reputation for reliability and technical excellence. The typical user will find they will need to replace the getter tubes after about two years use. (Replacements may be needed sooner if the gas is very impure for example). Replacement tubes are available at quick delivery and compare very favourably to higher cost competitive equivalents. The molecular sieve drier tube can have a longer life as it can be regenerated many times by using the in built regeneration facility.

Easy to use self-sealing plug-in gas connections are provided to ensure the user cannot leave the purifier open to air contamination when the purifier is disconnected from its feed gas.

◆ The improved electronics provide the following benefits:

◆ Easy to read back-lit lcd display showing:

- Purifier status
- Information on any fault condition
- Furnace hours
- System gas pressure (with optional pressure sensor)



◆ Intelligent monitoring of dual thermocouples to detect any mismatch.

◆ Remote indication of system ready.

◆ Led display to maintain compatibility with previous model and to provide a dual back-up indication of instrument status.

◆ No loss of furnace heating due to temporary loss of mains power

## Principle of Operation

The purification system consists of a furnace in which a titanium getter tube at 700°C removes oxygen and nitrogen by chemical reaction and a copper oxide tube at 450°C removes carbon monoxide, hydrogen and hydrocarbons, again by chemical reaction. Finally, external to the furnace, there is a molecular sieve drier tube, operating at ambient temperature, which removes moisture and carbon dioxide by physical adsorption. The molecular sieve drier tube can be regenerated in-situ by means of the band heater facility provided.

The furnace temperature is monitored by a pair of thermocouples. The signals from the thermocouples are measured by a microcontroller which in turn controls the amount of power fed to the furnace heater element using an opto-isolated triac circuit. The microcontroller will inhibit power to the heater if an over-temperature event occurs or if one of the thermocouples becomes open circuit. If a pressure sensor is fitted the microcontroller will also inhibit power to the heater if the gas pressure falls below 1 bar.

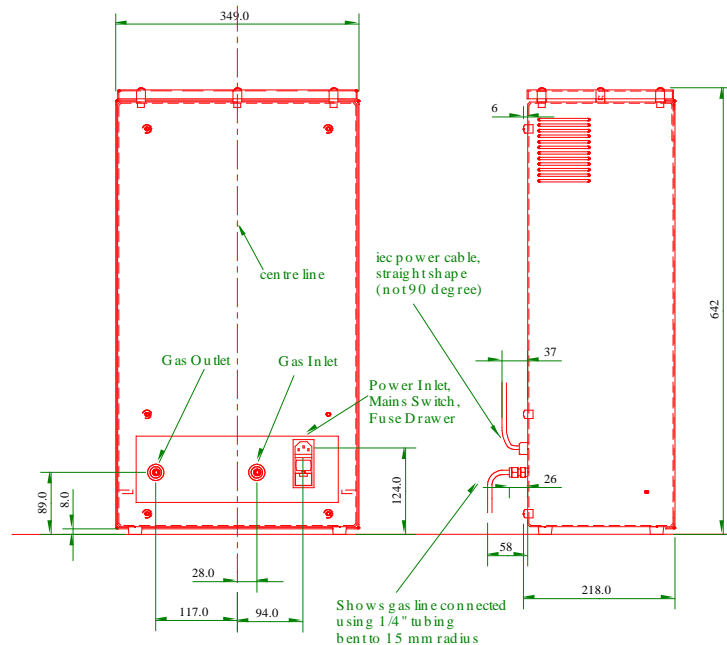
## Features and Benefits

- ◆ Point-of-use purification of commercial grade rare gases - total impurities reduced to a level of less than 1 vpm.
- ◆ Fast warm-up time.
- ◆ Automatic thermocouple temperature control and alarm system.
- ◆ Immune to wide fluctuations in ambient temperature and electrical supply
- ◆ Quick-connect, self-sealing gas connections.
- ◆ Stainless steel couplings and pipework.
- ◆ Band heater facility incorporated allowing in-situ regeneration of the molecular sieve drier tube.
- ◆ Fail safe design - offering long-term optimum performance and reliability.
- ◆ Easy to operate and service with quick-change tube feature.
- ◆ Very competitively priced
- ◆ Remote status indication and fault alarm system
- ◆ Compared to competitive alternatives – long term economy due to low initial cost and economic replacement of purifier tubes.

## Applications

- ◆ Purification of Argon or Helium for spectrometric analysis.
- ◆ Purification of Argon and Helium carrier gases for low level gas chromatographic analysis
- ◆ Purification of Argon or Helium for use as inert gas blankets.
- ◆ Anywhere there is a need for pure rare gases.

## Dimensions



## Options & Accessories

### Gas Side Entry Kit (Type F)

For users wishing to connect the gas lines to the side of the purifier where rear access is restricted. It allows the MP2000 to be fitted to gas lines set up for the original Sircal Rare Gas Purifier. NOTE: This is an option only. It cannot be fitted later as an accessory.



### Pressure Sensor

When fitted, the lcd display shows the system pressure in bar. Power to the furnace heater will be cut off if the pressure falls below 1 bar. This prevents unnecessary consumption of getter material in the event of gas supply failure. The user can fit this at a later date if a pressure sensor upgrade kit is ordered. Partial disassembly of the MP200 is required if this is fitted as an upgrade. Previous models of MP2000 can be fitted with this sensor but a new electronics control panel with an lcd display must also be fitted.

### Particle Filter

A sintered stainless steel particle filter (7 micron) is fitted at the outlet of the purifier (fitted internally). Recommended for applications that require pure gas with minimal particulate contamination. The user can fit this at a later date if a particle filter upgrade kit is ordered. Partial disassembly of the MP2000 is required to fit this as an upgrade.



### Gas Side Entry Kit (Type C)

This kit performs the same function as the type F side entry kit, but it can be fitted easily in the field to a standard MP2000. The Type C kit requires more space at the rear to accommodate the side entry tubing compared to the Type F kit.



### Metric Plug-In Gas Connectors

Gas is connected to the MP2000 through plug-in gas connectors. The standard plug-in gas connectors supplied are for connection to 1/4" tube. 6mm plug-in gas connectors may be specified as an alternative for areas where metric tubing is more common.

Specification	
Furnace temperature	680°C
Furnace warm-up time	15 minutes
Furnace temperature control	Dual thermocouple with microcontroller
Operating ambient temperature	0 - 40°C
Maximum recommended flowrate	10 litres/min
Minimum inlet pressure	1 bar (if pressure sensor fitted)
Maximum inlet pressure	17 bar
Gas connections	Plug-in gas connectors for 1/4" tube is standard 6mm plug-in connectors as optional alternative
Impurities removed	Oxygen, nitrogen, hydrogen, hydrocarbons, carbon monoxide carbon dioxide and moisture
Electrical supply	2 models available 230V, 1000 watts, 50 - 60 Hz 110V, 1000 wats, 50 - 60 Hz
Dimensions (mm)	642 (h) x 349 (w) x 218 (d)
Weight	19 kg (42.5 lb)



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