

# ES 4100

## Description

The **ES4100** Gas Standards Generator is an instrument designed to calibrate most types of gas analysers, including gas chromatographs, FTIR, GC-MS, Ion Mobility Spectrometers and also environmental chambers.

**ES4100** uses Permeation Tubes or Diffusion Tubes to generate low concentration gas standards for VOCs, Acid Gases, Amines, Sulphur gases and Hydrocarbons (over 400 compounds).

Interchangeable Permeation or Diffusion Tubes are used to provide a constant output of the component gas. This constant output is mixed with a much larger controlled flow of clean air or nitrogen, to generate an accurate concentration of calibration gas. Changing the dilution flow rate, the tube temperature, or the number of permeation tubes used, can vary the concentration output level. The instrument can also be adapted to produce mixtures of a variety of compounds by installing the appropriate types of Permeation Tube or Diffusion Tube.



For further information call: Eco Scientific Ltd. +44 (0)1453 885059  
or e-mail: [sales@eco-scientific.co.uk](mailto:sales@eco-scientific.co.uk)

## Benefits Of Using ES4100

Delivers ppm / ppb gas standard directly to the gas analyser.

Produces multi-point calibration standards from each permeation tube.

The user handles only small quantities of toxic gas.

Eliminates the necessity of keeping a large stock of gas cylinders

### Safe

- No high pressure cylinders required
- Removes risk of exposure

### Repeatable

- Drift-free output
- Can calibrate all analytical equipment to the same traceable standard

### Easy To Use

- Set the flow and the temperature -- no other adjustments required

### Economical

- No gas cylinders or rental required
- No false results
- Reduces the time required for calibration
- Calibration standard available 24/7
- One permeation tube can do hundreds of calibration checks
- Uses Disposable and liquid filled Refillable Permeation Tubes and also Diffusion Tubes.

### Features

The high thermal mass oven keeps the permeation tube at an accurate, constant temperature.

The digital temperature controller is accurate to  $\pm 0.1^{\circ}\text{C}$  and is traceable to UKAS.

The ES4100 uses disposable permeation tubes, Liquid Refillable Permeation Tubes and also Diffusion Tubes.

The internal mass flow meter measures the dilution flow to  $\pm 1,5\%$  of full scale.

The ES4100 is transportable and will can run 24/7 with a dedicated power supply unit or any external 12VDC battery or power supply.

The system is available with one oven module or two permeation oven modules for producing more complex gas mixtures.

### Applications

- Calibration for air quality monitoring
- Calibration of GC's or monitors used for process streams
- Standards for checking contaminants and purity in gas streams
- Calibration of homeland security monitoring equipment
- Calibration for monitoring purity of pharmaceutical products.

### Specifications

**Concentration Range:** 0.1 - 100 ppm, depending of type of tube used.

**Oven Capacity:** Up to 8 tubes SRT tubes, or 8 SRT2, or 6 HRT tubes, with a maximum length of 15cm

**Temperature Operating Range:**  $30^{\circ}\text{C}$  to  $80^{\circ}\text{C}$

**Temperature Control:** within  $\pm 0.1^{\circ}\text{C}$

Flow Range: 100 cc to 5000 cc/min (10 litres/min option available)

**Flow Control:**  $\pm 1,5\%$  of full scale, with repeatability of  $\pm 0.25\%$  of full scale

**Ambient Range:**  $5^{\circ}\text{C}$  to  $35^{\circ}\text{C}$ , or  $5^{\circ}\text{C}$  below set-point temperature.

**Dimensions:** 32cm wide x 30cm high x 42cm long

**Mass Weight:** 12.5 kg (with two oven modules)

**Power Supply:** 12V DC 4A, via dedicated ES4100 PSU, 100V to 260VAC @ 50/60 Hz operation.

**Traceability:** Traceable to UKAS/NIST

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