

## **Features and Specifications Sheet for FlexStream™ PM Module** **(Permeation Module)**

### **Principal of Operation**

Stable and accurate temperature control of permeation oven with small circulating flow to introduce component vapor emission from permeation tubes to larger dilution flow path of upstream module(s). Extends the number of permeation chambers/ovens in a series for creating complex gas mixtures.

### **Function**

Preparation of precise, adjustable, low concentration dynamically blended gas mixtures from permeation devices. Trace concentration calibrations – ppmv, ppbv, pptv

### **Permeation Chamber (Oven)**

Accepts KIN-TEK Trace Source™ disposable permeation tubes, diffusion tubes, high rate liquid filled tubes (LFH) and 57S prefilled gas permeation tubes. Permeation chamber (with glass adapter bottle) holds up to 8 disposable tubes with maximum 6-inch (15.2 cm) length x ¼ inch (0.635 cm) diameter (KIN-TEK HRT, SRT and EL tubes).

Chamber/oven is vertical, and each unit is supplied with a glass adapter bottle for use with disposable tubes. Oven holds the glass adapter bottle or one KIN-TEK LFH tube or one KIN-TEK 57 Series (57S/FPK) tube.

### **Oven Temperature Control**

High mass oven with electronic PID control. Control Range: 5 °C above ambient from 20 °C to 150 °C (heat only).

Setpoint Resolution: 0.01 °C across control range.

Display Resolution: 0.01 °C as shown on front panel touch screen.

Calibrated Accuracy: +/- 0.1 °C or better, calibrated traceable to N.I.S.T.

### **Component Flow Path**

Mixture contacts only glass, Teflon® and stainless steel (other materials available; specified a time of purchase). Suitable for reactive component gases.

### **Flow Control**

Small flow through permeation chamber/oven via fixed orifice of 50 micrometers to allow ~80-100 sccm of flow across permeation device(s).

### **Input Pressure**

Pressure based on input pressure regulator setting in FlexStream™ Base Module.

**Output Pressure**

Ambient to nominal 20 psig (138 kPa) maximum for span out mixture. (Output pressure above ambient requires additional interface, e.g., KIN-TEK Interface Module, to convert ambient span gas stream to a pressurized stream).

**Output Concentration Range**

Below 1 ppb to over 1,000 ppm (depending on permeation tube emission rate and dilution flow rate).

**Modes of Operation**

Standby, Span.

**Local Interface**

Via FlexStream™ Base module color touch screen display with virtual keypad.

**Remote Interfaces**

Connection to controlling FlexStream™ Base module via RS485 (DB9 connection).

**Communication Protocol**

Modbus RTU through FlexStream™ Base module.

**Computer Control**

Controlled through the microprocessor subsystem in the FlexStream™ Base module.

**Environmental Conditions**

Operating (Ambient) Temperature: 5 °C to 40 °C. KIN-TEK requires that the oven setpoint temperature be maintained at least 5 °C above the ambient room temperature.

Storage Temperature: 0 to 50 °C.

Relative Humidity: Maximum of 80% for operating (ambient) temperatures up to 31 °C decreasing linearly to 50% at 40 °C.

Maximum Altitude: 2000 m (only for CE-rated modules).

**Power Requirements**

United States: 110-125 VAC, 2A, 60 Hz

European Union (EU): 230V~, 1A, 50/60 Hz

European Electronic Fuse Replacement: F 1A L 250V

Purchase option (non-EU): 220-250 VAC, 1A, 50/60 Hz

**Dimensions**

7.5 inch (18.4 cm) Width x 13.5 inch (34.3 cm) Height x 20 inch (50.8 cm) Depth  
All dimensions are approximate.

**Weight**

25 lbs (11.3 kg) for Standalone module with portable carrying case. All weights are approximate.