



491Flex™ Base Module

Manual Permeation System

The 491Flex™ Base Module is a manually operated, stand-alone or expandable, permeation tube system for generating precision calibration gas standard mixtures. Mixtures are produced by diluting the gas emitted from Trace Source™ permeation (or diffusion) tubes with a dilution flow of inert gas, typically nitrogen or zero air. The 491Flex™ Base Module is ideally suited for generating trace concentration – ppm, ppb, and ppt – mixtures. The 491Flex™ Base Module is small, easily transportable, and easily combined with other 491Flex™ Modules to form the perfect scenario for calibrating gas analyzers, gas chromatographs, sensors, or detecting and monitoring devices. The 491Flex™ Base Module is built on the same platform as the fully automated FlexStream™ system.

Features

- Complete, ready-to-use, manually operated calibration gas system
- Modes of Operation: standby, zero, span
- Designed for expandability
- Local push-button interface
- Flow path suitable for reactive mixtures – mixture contacts only glass, Teflon®, stainless steel or coated stainless steel
- Accepts disposable permeation tubes, diffusion tubes, refillable tubes, wafer tubes, and prefilled gas permeation tubes
- Accepts up to 8 disposable tubes (KIN-TEK HRT, SRT and EL tubes) or 1 refillable tube (LFH, 57S) with maximum 6 inch length x ¼ inch diameter
- Works as a stand-alone permeation system or can be combined with other modules to form complex gas mixtures.

Operation

The 491Flex™ Base Module oven holds Trace Source™ permeation tube(s) at a constant precise temperature and introduces a small constant flow of dilution gas over the tube. Pure component vapor emitted from the permeation tube(s) mixes with this small flow to form a 'base' concentration gas mixture. This base mixture then joins a larger main dilution flow to form the final calibration mixture. The mixture concentration is set by adjusting that main dilution flow. Concentrations from sub ppb to over 1000 ppm are possible by selecting the appropriate permeation tubes. Concentration from each tube can be varied over a 20:1 range by adjusting dilution flow (standard flow range of 0.25 to 5.0 slpm).

Three output modes are possible:

- Standby – the permeation tube is held at operating conditions and the permeating gas is vented
- Zero – clean dilution flow is used to verify zero response
- Span – the permeation tube output is added to dilution flow to create a known concentration for calibration.

Combining the 491Flex™ Base Module with other 491Flex™ modules creates a unique calibration system capable of generating complex gas mixtures.

Specifications

- High mass oven with electronic PID temperature control
- Temperature Control Range: From 5 °C above ambient to 150 °C (heat only)
- Temperature Setpoint Resolution: 0.01 °C
- Temperature Display Resolution: 0.01 °C
- Standard Flow Range: 0.25-5.0 standard liters per minute
- Optional Flow Ranges: 0.1 - 1.0 slpm, 0.5 - 10.0 slpm
- Flow Control over Calibrated Range: < +/-1.5% of reading
- Sample Output Pressure: up to 40 psig
- Output Concentration Range: sub ppb – 1000 ppm depending on emission rate and dilution flow rate
- Power Requirements: standard 115VAC, 2A
- Power Requirements: optional (specify at purchase) 230VAC, 1A
- Dimensions: 7" (18 cm) Width x 13.5" (34 cm) Height x 20" (51 cm) Depth with portable carrying case. All dimensions are approximate.
- Weight approximately 30 lbs.

Benefits

TECHNICAL

- Creates trace concentrations of reactive compounds
- Applicable to a wide range of compounds (over 550)
- PPM and PPB mixtures with single step dilution
- Calibration even for some reactive mixtures
- Dynamic blending + immediate use eliminates storage degradation
- Allow complex mixture preparation
- Concentrations traceable to NIST (through physical variables)

OPERATIONAL

- Simple operation
- Easily transportable
- Expands 491Flex™ Base System for complex mixtures

ECONOMIC

- Save space – one unit replaces many gas cylinders
- Reduce cost of multi-point calibration

SAFETY

- Replaces high-pressure cylinders
- User deals with very small quantities of analyte compounds
- Analyte sealed in a rugged structure

KIN-TEK Analytical, Inc.
504 Laurel St., La Marque, Tx 77568 USA
Ph. 409-938-3627 • 1-800-326-3627
Fax: 409-938-3710
sales@kin-tek.com

To learn more about KIN-TEK visit www.kin-tek.com



Intertek

The KIN-TEK Analytical, Inc. Quality Management System is registered by Intertek as conforming to the requirements of ISO 9001:2015.

For more information: <https://kin-tek.com/kin-tek-quality>

NIST is a trademark of National Institute of Standards and Technology

© 2020 KIN-TEK Analytical, Inc. 2020/02 Rev. 0001