

PRODUCT BULLETIN

STREAMLINE™ PRO MULTICAL™ SYSTEM

The Streamline Pro MultiCal System is an important advance in NIST-traceable audit and calibration capabilities for air quality measurements. With its direct readout and internal storage of results in user-selectable units, the system makes it convenient to perform accurate in-field measurements of the parameters needed most: *flow rate*, *ambient temperature*, *barometric pressure*, and optional *filter temperature*.

The Streamline Pro unit is manufactured exclusively for Thermo by Chinook Engineering of Sheridan, Wyoming. The system builds upon the accurate and stable flow rate measurement capabilities for which the original Streamline FTS Flow Transfer Standard is known. It uses the same patented, orifice-based flow measurement configuration that ensures consistent performance throughout a wide range of ambient temperatures.

Multi-point factory calibration of the system's flow rate measurement is performed on a NIST-traceable critical Venturi flow bench that Chinook Engineering developed in close consultation with NIST. Chinook's state-of-the-art flow metrology facility ensures that each Streamline device provides NIST-traceable flow measurements to *primary mass and time standards*. The other parameters supported by the unit are certified using high precision reference standards.

The Streamline Pro system has the following features:

- NIST-traceable standard for *flow rate*, *temperature* and *barometric pressure*. Data generated by the unit are stored in nonvolatile memory.
- Integrated flow rate, temperature and pressure sensors, all in one unit.
- Optional external temperature probe for NIST-traceable audits/calibrations of *filter temperature* or other point temperature measurements.
- Linear performance for the measured parameters throughout the usable temperature range of -30 to 40 °C.
- Continuous, simultaneous readout of all measurements on the main display screen.
- Easy-to-use, menu-driven user interface.



Streamline Pro Kit Shown Above.



- Fits directly on 1 1/4 inch sample tube of an air sampler or monitor, with adapters available for other dimensions.
- Auto-off to protect against battery drainage.
- Uses 2 standard AA batteries. An optional AC adapter is available for continuous measurements.
- Programmable internal logging of audit/calibration data with time/date stamp. Optional interface to a PC.
- User-selectable measurement units.

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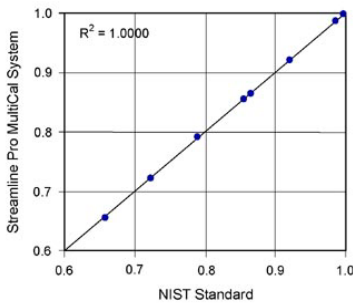
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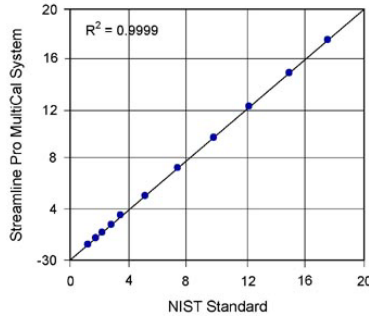
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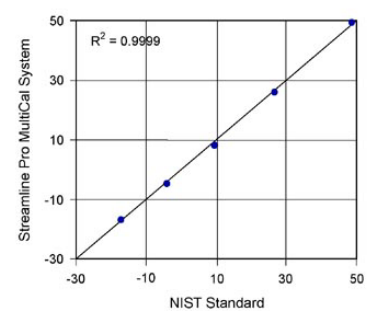
Barometric Pressure [atm]



Flow Rate [l/min]



Temperature [°C]



The graphs above show the performance of the Streamline Pro System against NIST standards over the unit's application range. With its patented, thermally-stable design, the MultiCal unit precludes the difficulties that can occur when operating over varying ambient weather conditions.

The USEPA has evaluated the Streamline flow rate measurement technology over a wide range of ambient air conditions. The testing showed that the Streamline flow meter provides accurate and consistent flow rate measurements through a variety of ambient environments (maximum estimated uncertainty of 0.8%). [Peters, T.M., and Vanderpool, R.W., *Laboratory Evaluation of the Chinook Orifice Flow Transfer Standard*, 1996, EPA Contract Number 68-D5-0040.]

The Streamline Pro MultiCal System contains a Venturi-type flow meter that determines the actual volumetric flow rate from the pressure drop across its patented restriction. Utilizing this measured pressure drop, as well as the local temperature and atmospheric pressure, the flow rate is automatically computed using the unique calibration constants built into the measurement cell of each unit.

Each Streamline Pro unit is supplied with NIST-traceable certifications for flow rate, ambient temperature, barometric pressure, and optionally the filter temperature. R&P supplies each Streamline Pro System with instructions for initiating the



Streamline Pro Unit with Optional External Temperature Probe.

recommended annual multi-point recertifications of measurement parameters at Chinook Engineering's NIST-traceable flow metrology lab.

A weatherproof carrying case supplied with the unit houses the MultiCal System,

calibration certificates, operating instructions, and room for basic accessories such as an adapter package.

Thermo offers the Streamline Pro MultiCal System and related accessories under the following part numbers:

- 57-008887 Streamline Pro MultiCal System (0.8-19 l/min)
- 57-008888 External Temperature Probe (Optional)
- 59-006642 Streamline Adapter Package
- 10-009470 AC Adapter for Continuous Measurements, 120 VAC
- 10-009473 AC Adapter for Continuous Measurements, 240 VAC (without power cord)
- 10-009473 Additional Measurement Unit, 0.8-19 l/min
- 10-009478 Replacement Streamline Pro Carrying Case

| | FlowRate | Air Temperature | Barometric Pressure | External Temp (Opt) |
|---|-----------------|-----------------|---------------------|---------------------|
| Range | 0.8 to 19 l/min | -30 to 45 °C | 0.65 to 1.1 atm | -30 to 40 °C |
| Sensitivity | 0.01 l/min | 0.1 °C | 0.002 atm | 0.1 °C |
| Uncertainty (% of full scale) | ±0.2% | ±0.1% | ±0.2% | ±0.1% |
| Usable Temperature Range: -30 to 40 °C Battery Life: 10 hours on 2 AA batteries | | | | |

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