Welch Allyn Surveyor™ Patient Monitors and Microstream® CO₂ Monitoring
With **Microstream® CO₂ Monitoring** by Covidien, recognize the difference in capnography performance.

**Technology that Helps Reduce the Cost of Ownership**

The Microstream brand name is rooted in the core of the technology. It refers to the ultra-low sampling flow rate of just 50ml/minute, compared to some competitive systems with flow rates greater than 100 ml/min. Microstream’s low flow technique allows efficient moisture filtration, which in turn eliminates the need for messy water separation fixtures which often accompany costly liquid collection bottles. Additionally, the Microstream’s internal pump and sensor are designed for 30,000 monitoring hours which equates to roughly 10 years of use (at 8 hours/day, 5 days/week). The pump is activated only after the CapnoLine® sampling line is connected, which further helps optimize its life and helps minimize maintenance costs.

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**Workflow Efficiency and CO₂ Accuracy**

Microstream technology is engineered to accomplish the critical task of simplifying the use of CO₂ monitoring. Through its reduced startup and usage times, it can improve efficiency and clinical workflow. Microstream Capnography produces accurate readings in a rapid timeframe so that clinicians can view their patient’s CO₂ status faster. Microstream-enabled technology warms up to full accuracy in seconds and requires calibration only once per year. Conversely, other CO₂ monitoring solutions may take longer to reach full accuracy and require frequent calibrations and manual zeroing. While Microstream CO₂ accuracy is unaffected by anesthetic agents, other CO₂ technologies may require users to enter concentration compensations to prevent false readings when anesthetic agents such as nitrous oxide are present.

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**Meaningful Alarm Management**

Smart Capnography is a suite of algorithms proven to reduce alarms and simplify the use of capnography monitoring. It includes Smart Breath Detection™ (SBD) to detect waveform patterns and Smart Alarm for Respiratory Analysis™ (SARA) to recognize and reduce clinically insignificant respiratory alarms, while accurately reflecting the patient’s condition and preserving clinically significant alarm vigilance. With SBD and SARA technology, respiration rate (RR) alarms have been shown to be reduced by 53% overall, and short duration alarms, which are alarms lasting less than 10 seconds, were reduced by an additional 19%. No significant RR alarms were missed with SBD and SARA technology. By reducing the distraction caused by clinically insignificant alarms, SBD and SARA technology can help preserve overall alarm vigilance, and thereby potentially contribute to improved patient safety.

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**Innovative Monitoring of Total Respiratory Status**

Integrated Pulmonary Index™ (IPI), a measurement index incorporated in Surveyor patient monitors, is the Covidien innovative IPI algorithm, developed to help clinicians more easily monitor a patient’s complete respiratory status. IPI incorporates real-time etCO₂, respiration rate, SpO₂, and pulse rate measurements into a single number that represents an inclusive respiratory profile.
Smart Design Sampling Lines

Microstream Smart CapnoLine® patient sampling lines are engineered to obtain a quality sample, regardless of the particular sampling line being used. Whether the patient is breathing from one or both nares, orally, or switching back and forth between nasal and oral breathing, with Smart CapnoLine sampling lines, a quality sample will be obtained. The patented Uni-junction™ design senses pressure from each breath, causing only the source of breath (i.e. oral, nasal) with the greatest pressure to be sampled.⁸,⁹

Ensuring Sampling Accuracy

Obtaining an accurate CO₂ measurement and waveform depends on quality sampling lines. If the sampling line is not providing a representative CO₂ sample, the accuracy of the measurement could be compromised. When three commonly used sampling lines designed for oral and nasal sampling were compared to the CapnoLine for CO₂ accuracy, each was shown to be statistically equivalent during nasal breathing. However, during mouth breathing, the Microstream Smart CapnoLine was able to maintain greater accuracy than the other brand sample lines.⁸

Contact your Welch Allyn representative or visit www.welchallyn.com to learn more.

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1 ZOLL M Series High and Low Flow etCO₂ Manual
2 Nonin Lifesense Manual, page 50 ("presented CO₂ or etCO₂ can be false indicating a high presence of N₂O and desflurane." Directs user to a compensation table.)
3 Smiths BCI Capnocheck manual, page 2-1 (requires activating “N₂O compensation”)
4 GE Dash manual, page 15-5 (user must select percentage of N₂O concentration to compensate for N₂O related elevated etCO₂ value)
5 Criticare 8100E specifications
7 Colman J, Cohen J, Lain D. Smart Alarm Respiratory Analysis (SARA) used in capnography to reduce alarms during spontaneous breathing. Supplement to ANESTH ANALG, April 2008, Volume 106, No. 4S, Abstract S-10.
9 Dungan G, Colman J, Lain D. Evaluation of oxygen delivery via a novel smart CapnoLine delivery system during simultaneous oxygen therapy and carbon dioxide monitoring. Presented at the Society for Technology in Anesthesia 2012 Conference, Palm Beach, FL.

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