

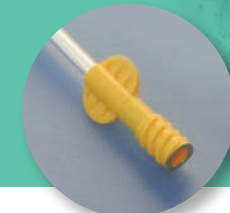


# Welch Allyn Surveyor™ Patient Monitors and Microstream® CO<sub>2</sub> Monitoring



With **Microstream® CO<sub>2</sub> Monitoring** by Covidien, recognize the difference in capnography performance.

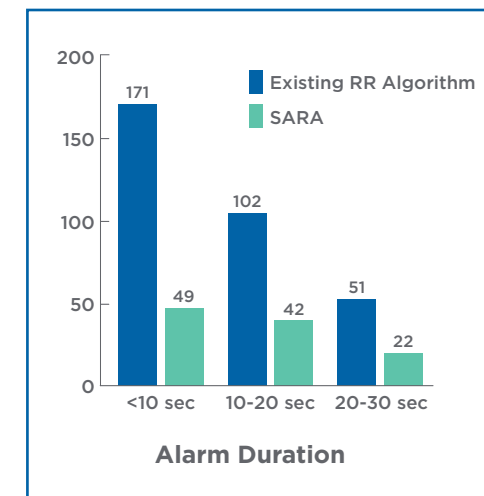
Technology that Helps Reduce the Cost of Ownership



Stay focused on your patient ventilation with CO<sub>2</sub> technology you can trust. Choose from a range of FilterLine® sampling lines, depending on your environment of use, as well as your patient's specific condition.

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.<sup>5</sup> Microstream 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 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.<sup>6</sup>

### Meaningful Alarm Management



Comparison of alarm events both with and without SBD and SARA. Fifty-six monitoring periods at 2 hours with low respiratory rate alarm set at 8 breaths per minute.<sup>7</sup>

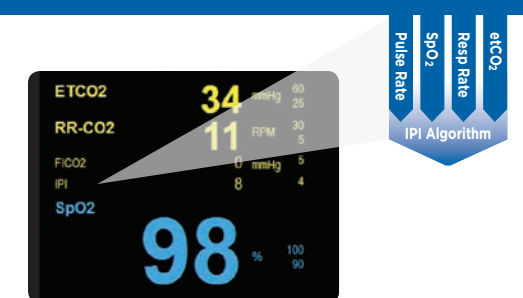
Smart Capnography is a suite of algorithms proven to reduce alarms and simplify the use of capnography monitoring. It includes Smart Breath Detection™ (SBD) to detect waveform patterns and Smart Alarm for Respiratory Analysis™ (SARA) to recognize and reduce clinically insignificant respiratory alarms, 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%.<sup>1</sup> 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.

### Workflow Efficiency and CO<sub>2</sub> Accuracy

Microstream technology is engineered to accomplish the critical task of simplifying the use of CO<sub>2</sub> monitoring. Through its reduced startup and usage times, it can improve efficiency and clinical workflow.<sup>1</sup> Microstream Capnography produces accurate readings in a rapid timeframe so that clinicians can view their patient's CO<sub>2</sub> status faster. Microstream-enabled technology warms up to full accuracy in seconds and requires calibration only once per year. Conversely, other CO<sub>2</sub> monitoring solutions may take longer to reach full accuracy and require frequent calibrations and manual zeroing. While Microstream CO<sub>2</sub> accuracy is unaffected by anesthetic agents, other CO<sub>2</sub> technologies may require users to enter concentration compensations to prevent false readings when anesthetic agents such as nitrous oxide are present.<sup>2-4</sup>

### 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 etCO<sub>2</sub>, respiration rate, SpO<sub>2</sub> and pulse rate measurements into a single number that represents an inclusive respiratory profile.

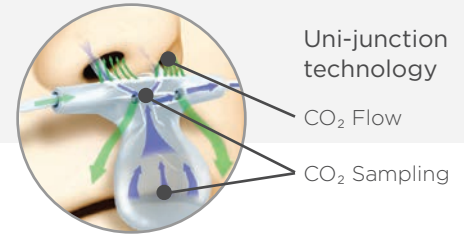


With the industry's broadest range of diagnostic cardiology solutions, we help people get better care, inside and outside the hospital. Backed by **clinical excellence, connected solutions and continuous innovation**, Welch Allyn Cardiology is proud to be powered by Mortara.



# 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.<sup>8,9</sup>



## Ensuring Sampling Accuracy

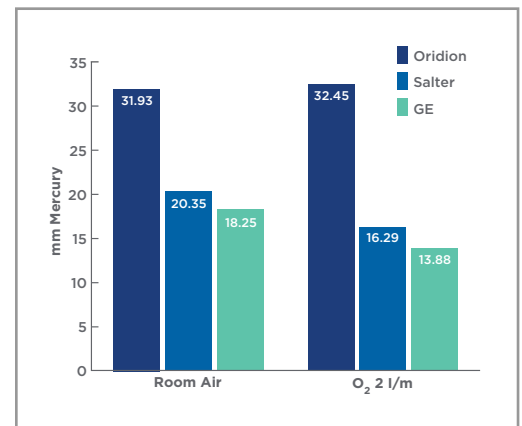
Obtaining an accurate CO<sub>2</sub> measurement and waveform depends on quality sampling lines. If the sampling line is not providing a representative CO<sub>2</sub> sample, the accuracy of the measurement could be compromised. When three commonly used sampling lines designed for oral and nasal sampling were compared to the CapnoLine for CO<sub>2</sub> 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.<sup>8</sup>



O<sub>2</sub>/CO<sub>2</sub> Nasal FilterLine for nasal sampling, with or without O<sub>2</sub> delivery.



Smart CapnoLine Plus CO<sub>2</sub> oral/nasal sampling line with or without the option to provide supplemental O<sub>2</sub>.



Contact your Welch Allyn representative or visit [www.welchallyn.com](http://www.welchallyn.com) to learn more.

<sup>1</sup> ZOLL M Series High and Low Flow etCO<sub>2</sub> Manual

<sup>2</sup> Nonin Lifesense Manual, page 50 ("presented CO<sub>2</sub> or etCO<sub>2</sub> can be false indicating a high presence of N<sub>2</sub>O and desflurane." Directs user to a compensation table.)

<sup>3</sup> Smiths BCI Capnocheck manual, page 2-1 (requires activating "N<sub>2</sub>O compensation")

<sup>4</sup> GE Dash manual, page 15-5 (user must select percentage of N<sub>2</sub>O concentration to compensate for N<sub>2</sub>O related elevated etCO<sub>2</sub> value)

<sup>5</sup> Criticare 8100E specifications

<sup>6</sup> MicromediCO<sub>2</sub> Integration Guide, p. 89, section 9.2.

<sup>7</sup> 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.

<sup>8</sup> Colman Y, David U. Comparison of Capnography Filter Lines for Nose and Mouth Breathing of End Tidal Carbon Dioxide Sampling With and Without Supplemental Oxygen. STA Annual Meeting Abstracts, January 2009

<sup>9</sup> 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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