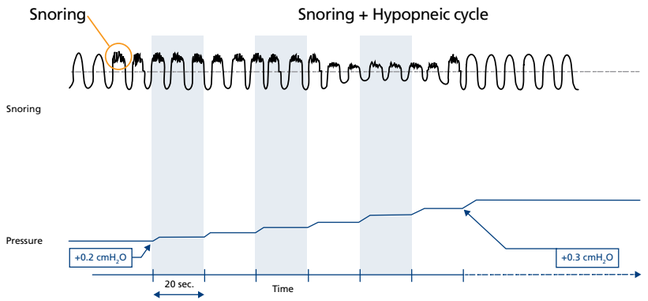
SNORING

Snoring is inspiratory noise caused by the vibration of the soft parts of the oropharyngeal walls.



Response	Control and Limits
• 0.2 cmH_2O increase every 20 seconds if snoring is in absence of hypopnea • 0.3 cmH_2O increase every 20 seconds if snoring is in conjunction with hypopnea	• 3.0 cmH_2O maximum increase for snoring in absence of other obstructive events • Cannot exceed Max P, set by clinician

AIRWAY STABLE

In absence of detected events, the Sandman Auto CPAP considers the airway to be stable.

Response	Control and Limits
Default mode (fast): • 0.5 cmH_2O decrease after 5 minutes • Subsequent 0.5 cmH_2O decrease each following minute if no events Slow mode • 0.2 cmH_2O decrease after 5 minutes • Subsequent 0.2 cmH_2O decrease each following minute if no events	• Cannot decrease below Min P, set by clinician • Clinician chooses pressure decrease rate

PART NUMBER

M-114802 - US Sandman Auto without humidification
M-114822 - US Sandman Auto with humidification
M-214830-10 - Clinical Kit, Sandman Series

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Sandman Auto™ CPAP Algorithm

The Sandman Auto CPAP incorporates the Adaptive Pressure Stability technology of the Sandman CPAP product line and the event detection of the Sandman Info™ CPAP device to advance the concept of the right pressure at the right time.

The Sandman Auto CPAP analyzes each breath for indications of upper airway instability, smoothly adjusting pressure delivery with the goal of providing the therapeutic pressure support required for optimal outcome and comfort. Responding continuously throughout the sleep cycle to meet pressure needs minimizes unfavorable outcomes from over or under delivering air flow, such as poor patient tolerance or periods of airway instability.

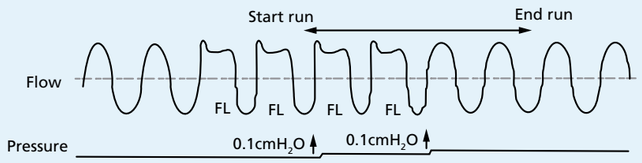
Sleep specialists and CPAP users value auto-CPAP because they know pressure needs can vary throughout the night and night-to-night as a result of sleep stage, position, fatigue, and other factors. The Sandman Auto CPAP provides this personalized support in a very comfortable manner.

At Covidien, our goal is to unite the sleep community to treat sleep apnea. As part of this effort, we present this review of the Sandman Auto CPAP. Understanding how the unit responds to events, clinician controls and limits on pressure adjustments enables sleep practitioners to utilize their insight to enhance patient treatment.

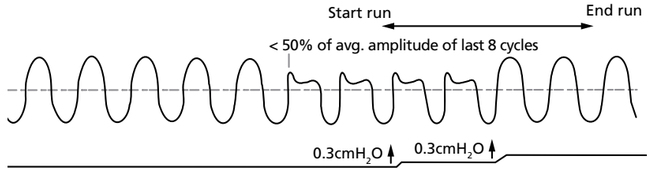
INSPIRATORY FLOW LIMITATION

Flattening of the inspiratory flow contour is one of the earliest indicators of upper-airway instability. A series of flow-limited breaths is called a Run of Inspiratory Flow Limitation.

Runs of Inspiratory Flow-Limited Cycles



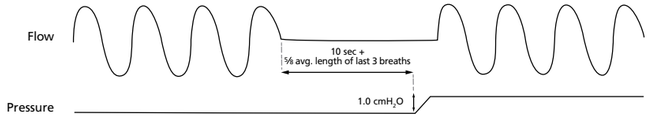
Runs of Inspiratory Flow-Limited and Hypopneic cycles



Response	Control and Limits
• 0.3 cmH_2O increase on identification of run if in conjunction with hypopnea (50% decrease from baseline amplitude) • 0.1 cmH_2O increase on identification of run in absence of hypopnea • Subsequent pressure increases every 2 breaths until Run resolved (up to 3 additional per Run). The increase is 0.3 or 0.1 cmH_2O depending on the presence of hypopnea	• Maximum of 4 increases or total increase of 1.2 cmH_2O on the same run • Delivery cannot exceed Max P, set by clinician • Clinician can disable response on Inspiratory Flow Limitation

APNEA

The Sandman Auto CPAP identifies respiration as apneic if a breath is not detected for 10 seconds, plus an allowance for respiratory rate. Apneas are then classified as obstructive or central.



Response	Control and Limits
• 1 cmH_2O increase once apnea is detected • 2nd - 1 cmH_2O increase after 15 seconds if no breathing is detected • 3rd - 1 cmH_2O increase after additional 15 seconds if no breathing is detected	• 3 cmH_2O limit to increase during single apneic event • Cannot increase above Max P, set by clinician • Returns to preset back-up pressure if no breathing detected for 2 minutes

APNEA WITH CARDIAC OSCILLATION

The detection of cardiac oscillations, pulsation of the heart conducted through the open airway, indicates an apnea is central rather than obstructive. The Sandman Auto CPAP does not increase pressure if cardiac oscillations are detected.