



Astral™ series
Life support ventilators

Complete care for your COPD patients

ResMed offers a variety of devices and services designed to make managing your ventilation patients easier than ever. In addition to responsive, automated algorithms, Astral ventilators have features such as a lightweight design, Big Button technology and a user-friendly interface that make it easy for patients and caregivers to operate. Additionally, the ResMed AirView™[†] for Ventilation patient management platform allows you to remotely view patient data so you can proactively intervene at the earliest signs of issues. With features like management by exception and data on demand, you'll be quickly alerted to adherence and therapy issues for enhanced troubleshooting capabilities. Choosing ResMed for your ventilation patients gives you the best-in-class device equipped with a ventilation management platform.

* iVAPS mode is intended for patients weighing more than 66 lbs (30 kg)

† AutoEPAP is contraindicated when using an invasive interface. AutoEPAP is only available in iVAPS mode

‡ When Astral is paired with the ResMed Connectivity Module (RCM), wireless connectivity is enabled, allowing key therapy data to be transmitted directly from Astral to the ResMed secure, cloud-based management system, AirView

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8 Diesem R. "Astral/Trilogy iVAPS/AVAPS comparison," Valley Inspired Products 2016; 16011.

9 Philips Trilogy 100 Clinical Manual.

10 Orr J et al. "Automatic EPAP intelligent volume-assured pressure support is effective in patients with chronic respiratory failure: A randomized trial," *Respirology* 2019 Dec;24(12):1204-1211.

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Advanced algorithms for changing ventilation needs



ResMed.com/Astral

Treating COPD with non-invasive ventilation

Chronic obstructive pulmonary disease (COPD) is a leading cause of morbidity and mortality worldwide. According to the CDC, more than 15 million Americans reported having COPD.¹ It is currently the fourth leading cause of death in the US² and global deaths from COPD are projected to increase by more than 30% over the next decade.³ Medicare data also shows that 19.6% of these COPD patients are readmitted to the hospital within 30 days of a hospital discharge.⁴ Finding the right treatment options can not only help improve the quality of life for these patients, but it can also help reduce healthcare costs and hospital readmissions. Based on recent clinical evidence reflecting the positive benefits of home non-invasive ventilation (NIV), in 2017, GOLD guidelines were updated to state: "NIV may improve hospitalization-free survival in selected patients after recent hospitalization, particularly those with pronounced daytime persistent hypercapnia ($\text{PaCO}_2 \geq 52$ mmHg)."⁵ Unfortunately, despite this guidance, only a small percentage of COPD patients are actually receiving some form of home ventilation.⁶

There are many treatment options for COPD, including NIV, which has been well established as an effective treatment for patients hospitalized with acute exacerbations of hypercapnic COPD.⁵ In addition, NIV has been shown to reduce PaCO_2 levels in patients with nocturnal hypoventilation, which has been observed in approximately 43% of patients with severe COPD.⁷

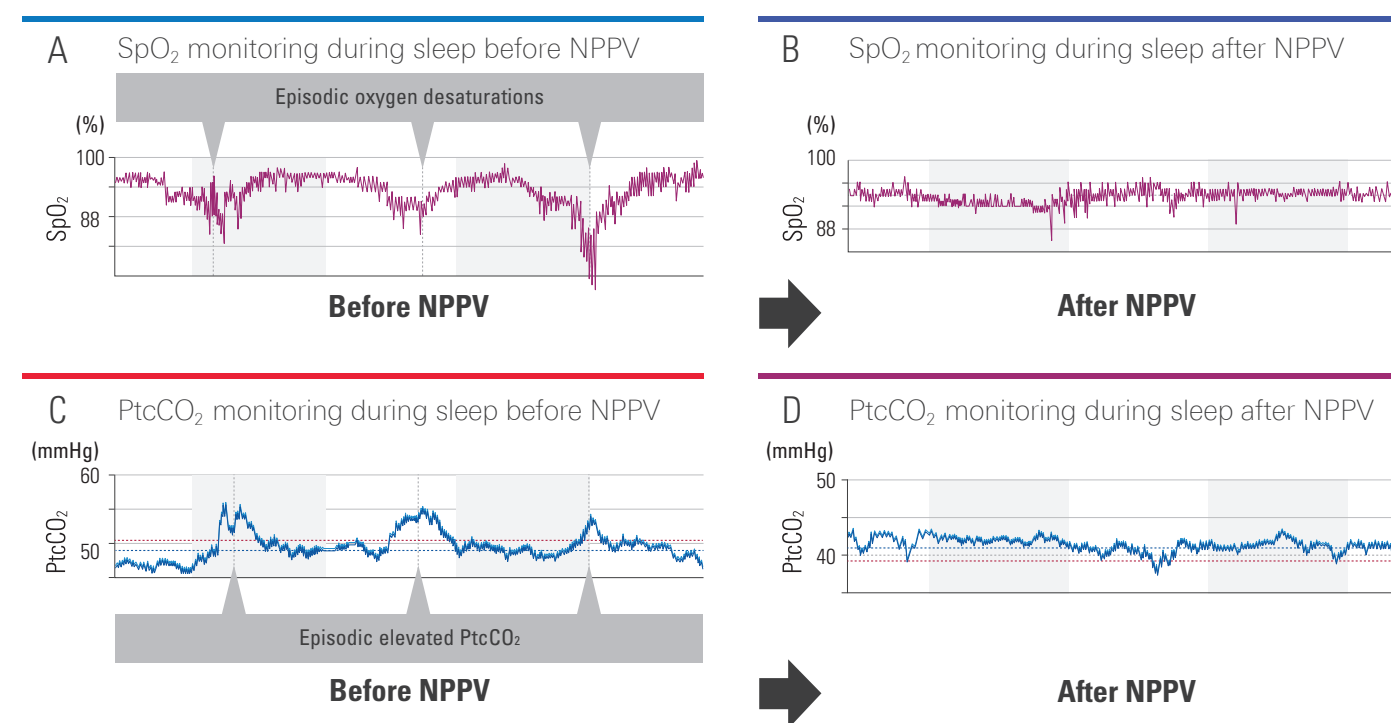


Figure A and C: Before non-invasive positive pressure ventilation (NPPV), nocturnal SpO₂ (saturation of pulse oximetry) and PtcCO₂ (transcutaneous carbon dioxide tension) monitoring showing episodic oxygen desaturations and episodic elevated PtcCO₂. Figure B and D: After NPPV, episodic oxygen desaturations and episodic elevated PtcCO₂ improved. Reproduced with permission from Kitajima 2018, Figure 3

Automatically adjusting to changes in ventilation

During sleep changes in ventilation frequently occur, which may be related to things like body position changes, changes in airway resistance and fluctuations in respiratory efforts. Advanced technology in NIV devices can accommodate these changes by automatically adjusting inspiratory pressure using volume-assured pressure support (VAPS) algorithms. VAPS modes of ventilation provide the comfort and synchrony of pressure support with the added assurance of volume-assured ventilation.

Unique modes designed with patients in mind

The key to successful patient treatment and tolerance is selecting the most effective ventilation mode for their condition. ResMed Astral™ ventilators offer two different VAPS modes:

- intelligent Volume-Assured Pressure Support (iVAPS™) uniquely targets minute ventilation
- Pressure Support with Safety Tidal Volume (PS/SVt) targets tidal volume

Both modes have more rapid response rates when compared to competitive modes of ventilation.⁸ One of the key differentiators for ResMed NIV algorithms is they allow for pressure support increases on a breath-by-breath basis vs a time increment. Additionally, iVAPS has been shown to reach a stable state of ventilation in significantly fewer breaths than Phillips Trilogy.⁹ In all testing scenarios, iVAPS achieved ventilation stabilization in fewer than 13 breaths, whereas Phillips AVAPS algorithm – with the AVAPS rate set to 5 cm, the fastest available setting⁹ – took significantly longer at up to 74 breaths.⁸

Automated upper airway support

Similar to the changing ventilation requirements that occur over time in patients with respiratory failure, upper airway support needs may also change over time. Given the complexity of patients with respiratory failure, many have limited access to NIV titration. Automated algorithms can be beneficial due to their ability to automatically adjust to a patient's changing needs.

A recent study showed that an automatically adjusting expiratory positive airway pressure (AutoEPAP¹) algorithm was as effective as manually titrated EPAP for effective upper airway treatment in respiratory failure patients.¹⁰ On average, the oxygen desaturation index (ODI) of those using iVAPS with AutoEPAP was 4% lower than those treated with iVAPS with manual EPAP.¹⁰

