

BiPAP autoSV Advanced treats patients suffering from Cheynes-Stoke respiration and other complex breathing patterns such as central sleep apnoea, mixed apnoea and complex apnoea.

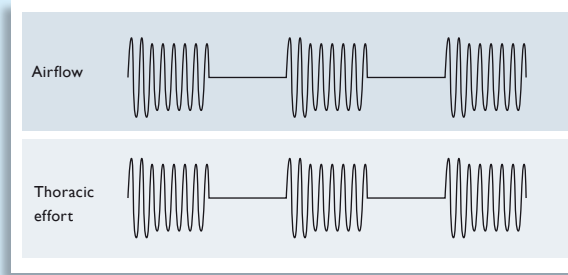


**51%** of male patients with stable heart failure have breathing disorders during sleep<sup>[12]</sup>

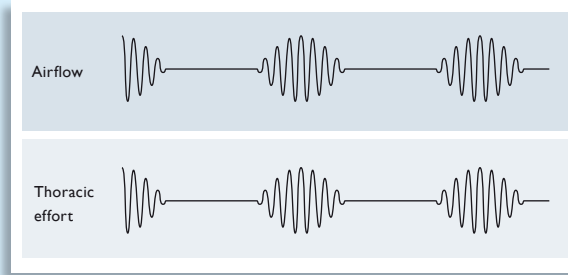
**80%** of patients with resistant hypertension<sup>[13]</sup> and 60% of patients who have had a stroke<sup>[14]</sup> have sleep apnoea

**2.87** A severe apnoeic patient is 2.87 times more likely to develop a cardiovascular condition<sup>[15]</sup>

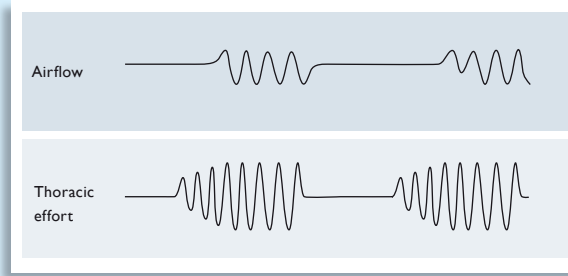
• Central sleep apnoea



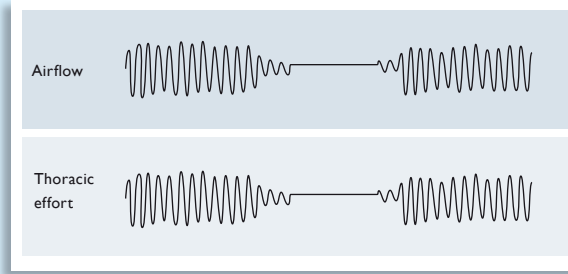
• Cheyne-Stokes respiration



• Mixed sleep apnoea



• Complex sleep apnoea (or CompSAS)



<sup>12</sup> Javaheri et al., Circulation 1999.  
<sup>13</sup> Logan et al., Hypertension 2001.  
<sup>14</sup> Bassetti et al. Sleep 1999.  
<sup>15</sup> 'Long Term Cardiovascular Outcomes with and without CPAP treatment in Patients with OSA' Marin et al. Lancet, 2005.

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# Advanced thinking

**BiPAP autoSV Advanced** further simplifies the management of complex sleep apnoea



# Proven efficacy

BiPAP autoSV Advanced is an auto-servo ventilation device. Thanks to its unique Digital Auto-TRAK technology, Auto EPAP, Bi-flex mode and its servo-ventilation algorithm, BiPAP autoSV Advanced aims to synchronise with the patient's breathing and rapidly normalise breathing patterns.



## Digital Auto-TRAK provides optimal synchronisation between the ventilator and the patient

- The revolutionary algorithm maximises patient comfort by constantly monitoring the patient's respiration.

## Using the servo-ventilation algorithm to normalise breathing patterns

- Continually monitored and adapted support as a result of high quality flow signal analysis.
- Fully customisable settings optimises patient comfort.
- An open system offering the ability to fine tune the settings (auto/fixed backup rates provide pressure support only when required).

- BiPAP ASV uses Digital Auto-TRAK technology, which is widely recognised as the most reactive (minimum time between respiratory effort and pressure support).<sup>[1]</sup>
- Auto-servo ventilation with BiPAP ASV efficiently reduces AHI and improves desaturation index.<sup>[2]</sup>

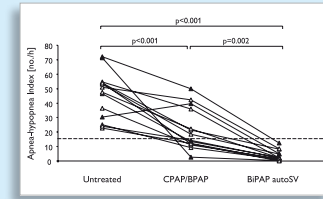


Table 2— Short-term Effects of CPAP/BiPAP and Flow-Targeted Dynamic BiPAP in Patients With CHF and CSA/CSA\*

Variables	Unreated	CPAP/BiPAP	Flow-Targeted Dynamic BiPAP	p Value, Unreated vs CPAP/BiPAP	p Value, Unreated vs Flow-Targeted Dynamic BiPAP	p Value, CPAP/BiPAP vs Flow-Targeted Dynamic BiPAP
Breathing during sleep						
AHI, events/h	46 ± 4	22 ± 4	4 ± 1	< 0.001	< 0.001	0.002
Apnea index, events/h	34 ± 5	16 ± 3	1 ± 0	0.003	< 0.001	0.012
Central apnea index, events/h	32 ± 5	15 ± 3	1 ± 0	0.006	< 0.001	0.014
Oxygen desaturation index, events/h	42 ± 4	22 ± 6	2 ± 1	0.005	< 0.001	0.005

- Treatment with BiPAP autoSV does not reduce PCO<sub>2</sub> and does not generate hyperventilation.<sup>[3]</sup>
- Treatment with BiPAP autoSV increases SpO<sub>2</sub> minimum.<sup>[4]</sup>
- BiPAP autoSV treats complex sleep apnoeas.<sup>[5]</sup>

Table 1 Complete study group (n = 10)

	Baseline	Treatment night one	6 Weeks
AHI total (h)	48.9 ± 20.6	8.9 ± 6.2	8.7 ± 7.4
AHI obstructive (h)	15.8 ± 16.2	2.4 ± 2.4	2.6 ± 2.5
AHI central (h)	33.1 ± 10.8	6.5 ± 4.9	6.1 ± 5.9
Obstructive apnoea (h)	4.9 ± 8.5	0.1 ± 0.1	0.5 ± 1.5
Mixed apnoea (h)	1.3 ± 2.0	0.0 ± 0.0	0.0 ± 0.0
Central apnoea (h)	1.2 ± 2.0	0.7 ± 1.5	0.0 ± 0.0
Periodic apnoea (h)	8.9 ± 15.3	0.2 ± 0.7	0.1 ± 0.3
Obstructive hypopnoea (h)	7.6 ± 7.9	2.1 ± 2.3	1.7 ± 2.0
Mixed hypopnoea (h)	2.1 ± 5.0	0.2 ± 0.5	0.3 ± 0.4
Central hypopnoea (h)	11.1 ± 10.1	3.2 ± 2.3	3.1 ± 2.9
Periodic hypopnoea (h)	11.9 ± 10.6	2.5 ± 2.4	2.9 ± 3.4
Snoring (min)	95.9 ± 75.9		5.7 ± 13.4
SpO <sub>2</sub> min (%)	76.9 ± 8.4	87.2 ± 2.2	88.6 ± 2.7
SpO <sub>2</sub> mean (%)	91.1 ± 4.0		93.1 ± 2.2

1 'Performance Characteristics of 10 Home Mechanical Ventilator' Chest 2005, Battisti et al.  
 2 'Effects of dynamic bilevelpositive airway pressure support on CSA in men with heart failure' Chest 2008, Arzt et al.  
 3 'Effects of Dynamic PAP support on PCO<sub>2</sub> in HF patients with CSA' APSS June 2008, Arzt et al.  
 4 'Adaptive Servoventilation with Coexisting OSA/H S and Cheynes Stokes Respiration' Sleep Medicine 2008, Randerath et al.  
 5 'Treatment of Complex sleep apnea syndrome' Current Treatment Options in Neurology 2008, Kuzniar, Morgenthaler.  
 6 Respiration 2008, Hertegonne KB, RomBaut B, Houtmeyers P et al.  
 7 'Pathogenesis of obstructive and central sleep apnea' Am J Respir Crit Care Med. 2005;172(11):1363-70. White DP.  
 8 'Night-to-night alterations in sleep apnea type in patients with heart failure' J Sleep Res. 2006 Sep;15(3):321-8. Tkacova R, Wang H, Bradley TD.

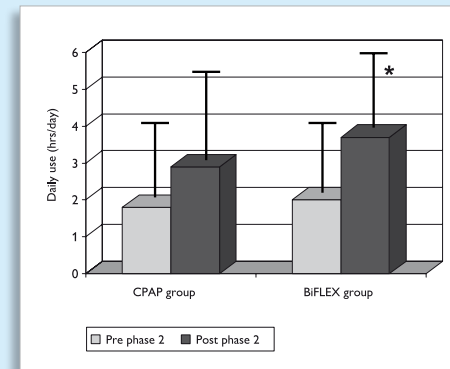
# Unique comfort



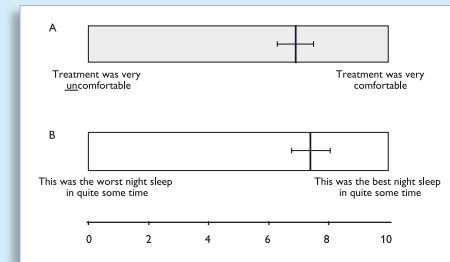
- Treatment with BiPAP autoSV decreases micro-arousal index and improves REM sleep quality.<sup>[9]</sup>
- A two phase intervention program when using BiPAP with Bi-Flex can improve compliance.<sup>[10]</sup>

	Baseline	Treatment night one	6 Weeks
AHI total (h)	51.5 ± 21.8	9.7 ± 6.7	9.1 ± 8.3
AHI obstructive (h)	17.4 ± 17.7	2.7 ± 2.6	3.1 ± 2.5
AHI central (h)	34.1 ± 11.7	7.0 ± 5.4	6.0 ± 6.6
Obstructive apnoea (h)	6.0 ± 9.2	0.1 ± 0.1	0.6 ± 1.6
Mixed apnoea (h)	1.6 ± 2.1	0.0 ± 0.0	0.0 ± 0.0
Central apnoea (h)	1.4 ± 2.1	0.7 ± 1.7	0.0 ± 0.0
Periodic apnoea (h)	9.8 ± 17.0	0.3 ± 0.7	0.1 ± 0.3
Obstructive hypopnoea (h)	7.2 ± 8.5	2.4 ± 2.5	2.1 ± 2.0
Mixed hypopnoea (h)	2.8 ± 5.6	0.3 ± 0.5	0.3 ± 0.4
Central hypopnoea (h)	9.6 ± 6.0	3.3 ± 2.6	3.3 ± 3.0
Periodic hypopnoea (h)	13.3 ± 11.0	2.6 ± 2.6	2.5 ± 3.6
Snoring (min)	116.2 ± 70.8		7.1 ± 14.8
SpO <sub>2</sub> min (%)	75.6 ± 8.9	87.0 ± 2.4	89.1 ± 2.8
SpO <sub>2</sub> mean (%)	90.8 ± 3.6		93.4 ± 1.9
SpO <sub>2</sub> <90% (min)	20.5 ± 26.6		5.2 ± 11.1
Arousal total	31.7 ± 26.6	17.7 ± 10.9	17.7 ± 10.9
Arousal resp.	9.4 ± 12.0	1.5 ± 2.5	1.5 ± 2.5
WASO (min)	105.4 ± 31.3	76.1 ± 49.7	76.1 ± 49.7
Sleep latency (min)	26.9 ± 36.1	30.8 ± 36.1	30.8 ± 36.1
TST (min)	328.7 ± 78.5	335.1 ± 55.7	335.1 ± 55.7
REM (min)	38.1 ± 22.8	68.1 ± 23.3	68.1 ± 23.3
S1, S2 (min)	235.8 ± 62.3	194.9 ± 43.6	194.9 ± 43.6
S3, S4 (min)	54.3 ± 44.1	72.0 ± 38.3	72.0 ± 38.3
REM (%)	11.1 ± 5.3	20.8 ± 8.4	20.8 ± 8.4
S1/S2 (%)	72.9 ± 13.8	58.4 ± 10.8	58.4 ± 10.8
S3/S4 (%)	15.9 ± 11.1	20.8 ± 10.9	20.8 ± 10.9

Baseline vs. treatment: \*p < 0.05, \*\*p < 0.01.



- Comfort and sleep quality is appreciated by the patient.<sup>[11]</sup>



9 'Adaptive Servoventilation with Coexisting OSA/H S and Cheynes Stokes Respiration' Sleep Medicine 2008, Randerath et al.  
 10 'Interventions to improve compliance in sleep apnea patients previously non-compliant with continuous positive airway pressure' J Clin Sleep Med 2007;3(7):706-712. Ballard RD, Gay PC, Strolo PJ.  
 11 'Effects of dynamic bilevelpositive airway pressure support on CSA in men with heart failure' Chest 2008, Arzt et al.

# Simplicity



## Titrate

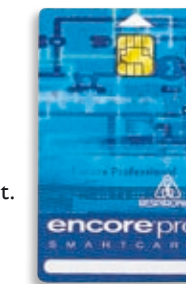
### Simple settings and treatment initiation with PC Direct

At-a-glance pressure levels and leaks, all displayed in realtime. There is also the ability to print a prescription report.



### Simple and secure device settings, all managed by a Smart Card

Adjust settings upon prescription on-the-spot.



## Treat

### Uses every type of mask without the need to calibrate

Use the type of mask best suited to the patient's needs. Use the type of mask best suited to the patient's needs without calibrating the device.



ComfortGel Full



ComfortGel

### Easy settings

By simply setting expiratory and inspiratory pressure ranges, you will be quickly ready to start treatment.

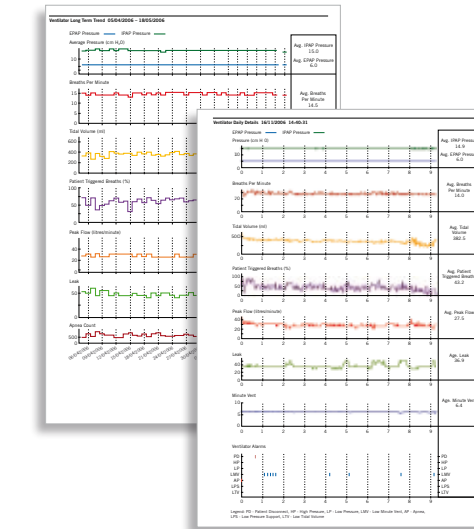
### Better leak compensation

Give more flexibility to your patient with a leak compensation of up to 60 l/min.

## Follow-up

### Quick and full patient follow-up with Encore Pro report

Analyse data such as compliance, leaks, flows, pressures, % of periodic breathing, residual events and % of spontaneous breathing.



### Differentiate between AH event types

The new Encore Pro 2 allows you to report open vs closed airway events to evaluate the therapy efficacy more effectively.

# Improved clinical results... thanks to Auto EPAP

- Based on the clinically proven REMstar auto algorithm, the obstructive events will be effectively treated at optimal level of pressure.<sup>[6]</sup>
- Limited increase of EPAP can be necessary as an initial central event can drive an obstructive event.<sup>[7]</sup>
- Quicker reaction in the event of obstructive hypopnea.
- Adequate adaptation of EPAP to prevent pressure induced central apnoeas.
- Better adaptation to differing nighttime conditions.<sup>[8]</sup>