# sleepcube

## Effective Treatment for Obstructive Sleep Apnoea

**DeVilbiss** HEALTHCARE

# sleepcube

**The SleepCube Series of Positive Airway Pressure devices from DeVilbiss Healthcare is designed to meet the varied needs of people suffering from Obstructive Sleep Apnoea (OSA) and Sleep Disordered Breathing (SDB).**

Built to the highest standards the SleepCube series is a robust compact range of CPAP devices which can be used both in the home and hospital environment. The SleepCubes' multi voltage capability allows it to be used virtually anywhere in the world and it can also be operated from a 12 V power source such as those found in a motor home. For the monitoring of patient compliance DeVilbiss Healthcare has developed SmartCode and SmartLink which are available for use with all models of SleepCube.

WITH **SmartFlex** INSIDE

## SleepCube Standard / Standard Plus

The SleepCube Standard device is a fixed pressure CPAP and delivers a constant pressure of between 3 and 20 cm $H_2O$. The SleepCube Standard Plus model adds SmartFlex technology, an expiratory relief function designed to lower the average pressure throughout the night for added user comfort.

WITH **SmartFlex** INSIDE

## SleepCube AutoPlus

The SleepCube AutoPlus has a unique autoadjusting algorithm that responds to apnoeas, hypopnoeas and snoring to deliver the most effective therapy whilst sleeping. The AutoPlus model also features SmartFlex expiratory relief for increased patient adherence.

## SleepCube BiLevel S

The SleepCube BiLevel S is a variation on traditional CPAP. Instead of providing air at a constant pressure all night the machine senses if you are breathing in or out and varies its pressure level accordingly. This is particularly useful for those users who require a higher pressure setting.

## SleepCube Auto BiLevel

The Auto BiLevel adds an extra level of comfort for BiLevel users. With our 'proven' auto-adjusting algorithm the Auto BiLevel constantly monitors for apnoeas and events. Upon their detection the BiLevel pressure automatically adjusts to deliver the best possible treatment during sleep.

## SleepCube BiLevel ST

The SleepCube BiLevel ST is designed to enhance the breathing of patients with spontaneous respiration. It does not breathe for the patient but instead supports those who suffer from chronic respiratory failure, breathing difficulties or OSA. Features include a customisable trigger, real time display and a pressure range of 3 - 25 cm $H_2O$

# SmartLink 2.5.6 software package

The SmartLink 2.5.6 software from DeVilbiss Healthcare is a comprehensive therapy management system for monitoring and recording CPAP usage and evaluating the effectiveness of CPAP therapy.

## Device management

The SmartLink platform is the ideal therapy management tool for physicians and healthcare providers as it allows the user to easily track and monitor their patients.

- Notes and reminders can be set up in the built-in calendar. Daily and overdue reminders are also highlighted in the SmartLink dashboard.

- Documents can be attached directly to patient notes within the database

- New study data on the data card is automatically detected and imported into the software. Direct connection to PC is also available.

- Databases can be added to local and shared networks.
  All patient databases from previous versions of the SmartLink software can be imported.

## Data analysis

Raw analytical data is displayed in the SmartLink dashboard. This allows users to sort, filter and export data for further analysis.
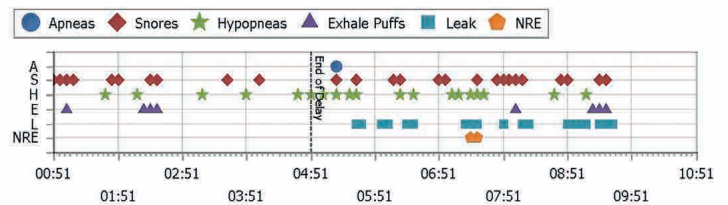
- Easy to use dashboard provides key SmartCode and SmartLink metrics, recent activity and reminders in a user friendly tabular format.

- Dashboard layout can be customised to show or hide specific fields, metrics or parameter statistics.

- Data can be exported into Excel for data analysis and backup purposes
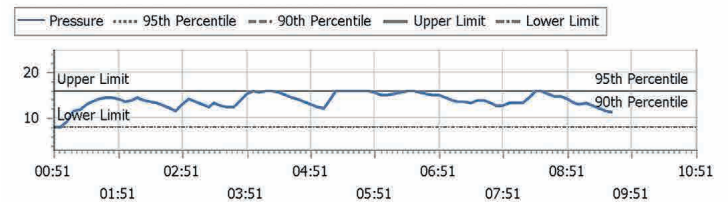
## SmartLink report editor

The SmartLink report editor is a user friendly reporting tool which enables the user to customise patient reports to clearly display key data using tables and graphs.

- 7 standard report templates – patient information, nightly, summary, monthly SmartCode, oximetry and multi-night

- Easy to use report editor for generating up to four customised versions of each report

- Drag and drop feature enables data and graphs to be arranged in preference order.

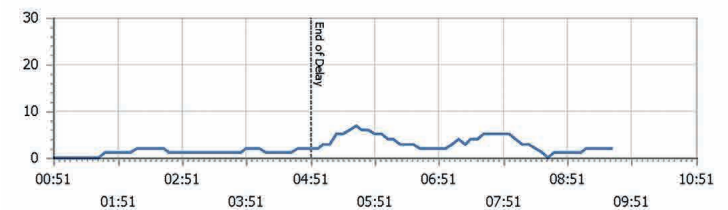- Reports can be easily exported into various file formats

## Events



## Pressure (mbar)



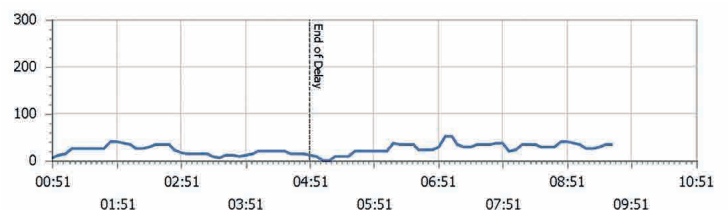## Pressure Statistics

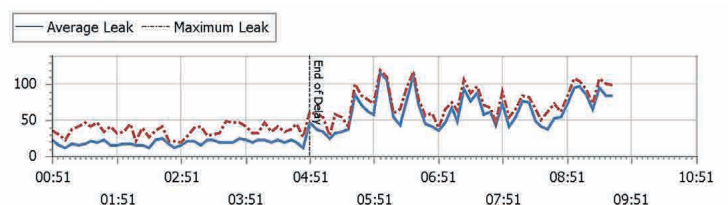| | | | |
|---|---|---|---|
| Max Pressure: | 18,1 hPa | 95th Percentile Pressure: | 13,0 hPa |
| 90th Percentile Pressure: | 11,0 hPa | Average Pressure: | 6,6 hPa |
| Standard Deviation: | ±2,7 hPa | Average Pressure Plateau: | 0,0 % |

## AHI



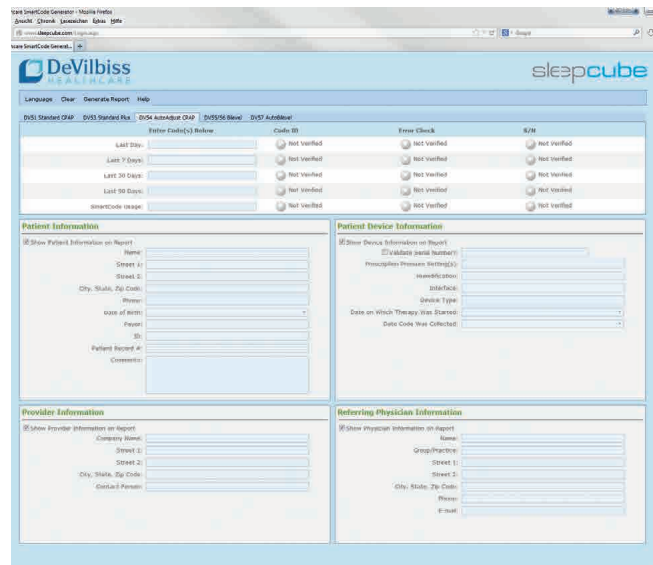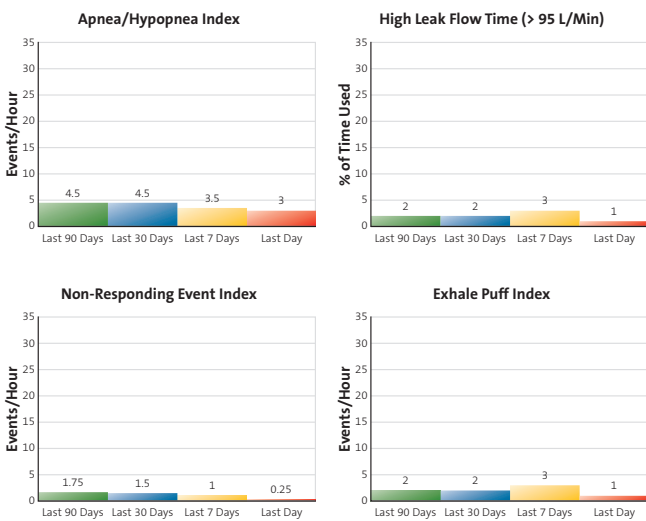## Snore Index



## Average Leak (L/min)

# SmartCode

SmartCode is a simple and effective way to remotely track compliance data. SmartCode is an alpha-numeric code that is shown on the display of the SleepCube which provides summary data for the previous day, 7 days, 30 days, 90 days or cumulative. The SmartCode reading and an internet connection or SmartLink 2 desktop software is all that is needed to access the patients' information. The SleepCube device does not need to be directly connected to the computer, nor does it use memory cards.

SmartCode is available in every model of SleepCube without any additional fees, equipment or software and provides insightful data that can be used to determine the patients' compliance.



SleepCube with SmartCode display



**Apnea/Hypopnea Index**

| | Last 90 Days | Last 30 Days | Last 7 Days | Last Day |
|---|---|---|---|---|
| Events/Hour | 4.5 | 4.5 | 3.5 | 3 |

**High Leak Flow Time (> 95 L/Min)**

| | Last 90 Days | Last 30 Days | Last 7 Days | Last Day |
|---|---|---|---|---|
| % of Time Used | 2 | 2 | 3 | 1 |

**Non-Responding Event Index**

| | Last 90 Days | Last 30 Days | Last 7 Days | Last Day |
|---|---|---|---|---|
| Events/Hour | 1.75 | 1.5 | 1 | 0.25 |

**Exhale Puff Index**

| | Last 90 Days | Last 30 Days | Last 7 Days | Last Day |
|---|---|---|---|---|
| Events/Hour | 2 | 2 | 3 | 1 |

| Model | Parameters |
|---|---|
| SleepCube Standard | % of days at least 4 or 5 hours (min threshold) |
| | Day count |
| | Days at least 4 or 5 hours |
| | Average hours per day |
| | While breathing hours |
| SleepCube Standard Plus SleepCube BiLevel S | **As above including the following parameters:** |
| | Apnoea / Hypopnoea Index – number of apnoea / hypopnoea events detected/hr |
| | Non-Responding Event Index – number of non-responding events detected/hr |
| | High Leak Flow Time – % of therapy time that the system leak was above 95l/min |
| | EPI – Exhale Puff Index (mouth breathing) |
| SleepCube AutoPlus SleepCube AutoBilevel | **As above including the following parameters:** |
| | Time at Pressure – 90th / 95th percentile pressure |
| | Pressure Plateau – percentage of time at upper pressure limit |
| SleepCube BiLevel ST | **As above including the following parameters:** |
| | % Machine Inspiration – % breaths in which the Timed Backup has been initiated on inspiration |
| | % Machine Expiration – % breaths in which the Timed Backup has been initiated on expiration |

# Features & Accessories



SmartFlex and Flow Rounding settings

### SmartFlex – Expiratory Relief

SmartFlex increases the comfort and adherence to the CPAP therapy by reducing the pressure when the patient is exhaling. SmartFlex has three settings, each of which reduces the CPAP pressure by 1 cm $H_2O$ during exhalation. SmartFlex can either be used for the whole night or simply during the ramp period to enable patients to fall asleep more easily. If an apnoea, hypopnoea or a snore is detected SmartFlex will turn off and will only resume once events are no longer detected. SmartFlex is available in the SleepCube Standard Plus and Auto Plus.

### Flow Rounding

Flow Rounding is a patented technology from DeVilbiss Healthcare which enables a smooth transition from inspiratory (IPAP) to expiratory pressure (EPAP). There are 6 levels of flow rounding with level 0 having the steepest slope and quickest transition and level 5 having the gentlest slope and slowest transition. By tailoring the pressure waveform (see diagram) according to the users requirements, the chances of waking the patient are reduced and comfort is increased.

### Heated Humidifier

The optional heated humidifier integrates seamlessly into the SleepCube CPAP devices and offers the patient 10 heat settings to ensure maximum comfort during therapy.



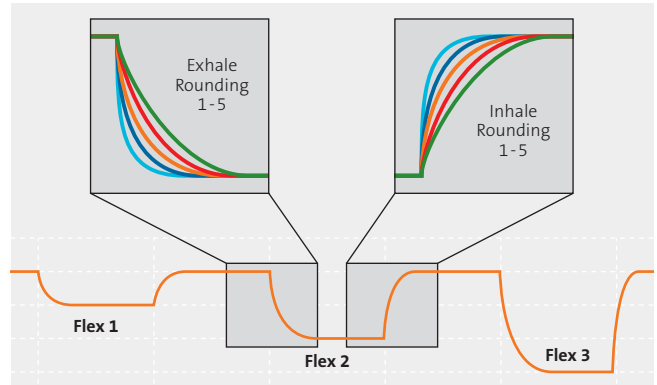Optional SleepCube Heated Humidifier

### SmartLink Module

(For Sleep Labs and Physicians only)

The SmartLink module can be added to any SleepCube device increasing its capability from being a CPAP to a complete therapy management system. When attached to a SleepCube Auto Plus up to 3 years usage data, 120 detailed nights data and 72 hours of oximetry data (using optional oximeter) can be collected, providing all the parameters to optimize patient therapy management.



SmartLink Module and Software package

### Pulse Oximeter

By adding the oximeter accessory to the SleepCube, it becomes the ideal device for conducting CPAP titrations and split night studies. A selection of different probes are available including finger probes and an ear probe. The oximetry reports are combined within the SmartLink 2 desktop software for greater ease of patient analysis.



SleepCube with SmartLink Module and pulse oximeter attached

# sleepcube

| Specifications | SleepCube Standard | SleepCube Standard Plus | SleepCube Auto Plus | SleepCube BiLevel S | SleepCube AutoBilevel | SleepCube BiLevel ST |
|---|---|---|---|---|---|---|
| **Dimensions (H x W x L)** | 10.7 x 16.5 x 17.5 cm | | | | | |
| **Weight** | 1.2 kg | | | | | |
| **Pressure Range (cm H₂O)** | 3 - 20 CPAP | | | 3 - 25 BiLevel | | |
| **Operating modes** | CPAP | CPAP | CPAP, AutoAdjust | CPAP, Spontaneous | CPAP, Spontaneous, AutoBilevel | CPAP, Spontaneous, Spontaneous Timed, Timed only |
| **Operation** | 5° C to 40° C; 0 % to 95 % R.H. non-condensing | | | | | |
| **Atmospheric conditions** | Sea level to 2,700 m | | | | | |
| **Storage and transportation** | - 40° C to + 70° C; 0 % to 95 % R.H. non-condensing | | | | | |
| **Sound level** | 26 dBA (tested to ISO17510) | | | | | |
| **Power consumption** | Maximum 65 W from AC power source (PAP device only) | | | | | |
| **Electrical requirements** | 100 - 240 VAC, 50/60 Hz | | | | | |
| **Equipment classification (protection against electric shock)** | Class II | | | | | |
| **Degree of electric shock protection** | Type BF Applied Part | | | | | |
| **Degree of protection against ingress of liquids** | IPX1 | | | | | |
| **Auto altitude adjustment** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Max. operating altitude (approx.)** | 2,700 m | | | | | |
| **Ramp time** | Linear Ramp 0 - 45 min., in 5 min. increments | | | | | |
| **Auto ON/OFF** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **SmartFlex** | – | ✓ | ✓ | – | – | – |
| **Quick view option** | – | ✓ | ✓ | – | – | – |
| **Real-time display** | – | – | – | ✓ | ✓ | ✓ |
| **Flow rounding** | – | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Event detection (AP, HYP, SN)** | – | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Visual mask off alert** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## DeVilbiss HEALTHCARE

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