RESMED

S9™ Series AutoSet™ & Elite™

POSITIVE AIRWAY PRESSURE DEVICE

Data Management Guide

English

The following table shows where data from the S9 Series devices can be viewed. Data displayed in ResScan™ can be downloaded via:

- S9 USB adapter and cable, connected directly from the S9 Series device to the computer
- SD card.

***Note**: Please refer to your S9 Series device Clinical Guide for further details.*

Viewing Data

Parameter	S9 Sleep Report Screen	ResScan[1]
Type of Data	STORED	STORED
S9 AutoSet /S9 Elite		
AHI/AI/CAI	✓	✓
OAI/UAI		✓
Events		✓
Flow Limitation		✓
Flow (L/sec)		✓
Leak (L/sec)	✓	✓
Minute Ventilation (L/min)		✓
Pressure (cm H_2O)	✓	✓
Pulse Rate (beats/min)[2]		✓
Snore		✓
SpO_2 (%)[2]		✓
Usage	✓	✓

1. In ResScan, via the SD card, data for all parameters is available for viewing, as shown in the table above. Via the S9 USB adapter and cable, data available for viewing includes only values for AHI/AI/CAI/OAI/UAI, Leak, Pressure, and Usage.
2. Only available if an oximeter is used with the S9 device.

ResScan Downloaded Data

	Via S9 USB Adapter	Via SD Card
S9 AutoSet/S9 Elite	✓ 365 summary sessions	✓ 365 summary sessions 30 detailed sessions 7 high-rate detailed sessions

ResScan Review Screen Displays

	Statistics	Summary Graphs	Detailed Graphs	Oximetry Statistics[1]
S9 AutoSet/S9 Elite	✓	✓	✓	✓

1. Only available if an oximeter is used with the S9 device.

ResScan Review Screen Display Descriptions

	Statistics	Summary Graphs	Detailed Graphs
Apnea Indices	✓ Shows the AHI, AI, HI, OAI, CAI and UAI for the selected sessions in the Data Browser.	✓ Shows a vertical bar graph where the lower segment is the median AI per hour, and the upper segment is the median AHI per hour.	✓ Shows a cumulative total of the number of apneas and hypopneas that have occurred. The cumulative total is reset every hour, on the hour.
Events			✓ Apneas are shown at the time they end. The duration of the apnea, in seconds, is displayed above the symbol. Apneas are represented by colored symbols, where the height of the symbol is proportional to the duration of the apnea. The type of apnea (obstructive, central, or unknown), is indicated by the symbol and its color. The duration of the apnea, in seconds, is displayed above the symbol Hypopneas are recorded and displayed after ten seconds. Hypopneas are represented by a blue rectangle.
Flow Limitation			✓ Shown on a scale ranging from flat to round.
Flow			✓ Shown as a blue trace.
Leak (L/sec)	✓ Shows the maximum, 95th percentile, and median statistics for the selected sessions in the Data Browser.	✓ Shows the maximum, 95th percentile, and median statistics for single sessions.	✓ Shown as a blue trace. A red line provides a reference level of the recommended maximum acceptable leak.
Minute Ventilation (L/min)			✓ Shown as a blue trace.
Pressure (cm H_2O)	✓ Shows the maximum, 95th percentile, and median statistics for the selected sessions in the Data Browser.	✓ Shows the maximum, 95th percentile, and median statistics for single sessions.	✓ Shown as a blue trace.
Pulse Rate (beats/min)			✓ Shown as a blue trace.
Snore			✓ Shown on a scale ranging from quiet to loud.
SpO_2 (%)			✓ Shown as a blue trace. A red line provides the 90% reference level to assist identification of desaturations.
Usage	✓ Total hours used, Daily usage, Used Days ≥ X:YY hours, Used Days < X:YY hours, Total days and % Used Days. Calculated for the sessions selected in the Data Browser.	✓ Each period is shown as a solid bar. A hollow bar indicates a period of usage where the end-time is unknown. There is a limit on the maximum number of separate bars shown for a single session.	

Updating Settings

Parameter	Mode		ResScan via S9 USB Adapter	ResScan via SD Card
	CPAP	AutoSet		
S9 AutoSet/S9 Elite				
Therapy Mode[1]	✓	✓	✓	✓
Set Pressure	✓	–	✓	✓
Maximum Pressure	–	✓	✓	✓
Minimum Pressure	–	✓	✓	✓
Start Pressure	✓	✓	✓	✓
Maximum Ramp Time	✓	✓	✓	✓
EPR	✓	✓	✓	✓
EPR Level	✓	✓	✓	✓
EPR Inhale	✓	–	✓	✓
Mask	✓	✓	✓	✓
Tube	✓	✓	✓	✓
Climate Control	✓	✓	✓	✓
Sleep Quality	✓	✓	✓	✓
SmartStart™	✓	✓	✓	✓
Language	✓	✓	✓	–
Local Date & Time	✓	✓	✓	–
Reminders	✓	✓	✓	✓

1. Therapy Mode for the S9 Elite is fixed as CPAP.

ResScan Detailed Graphs Specifications

Parameter	Resolution	Range	Sampling period (sec)	
			via S9 USB Adapter	via SD Card
Events (sec)	1 (apnea duration)	10–120 (apnea duration)	Aperiodic	Aperiodic
AHI	1 (event per hour)	0–120 (events per hour)	n/a	Aperiodic
Flow Limitation	n/a	Round to flat	n/a	2
Flow (L/min)	1	-127 to 127	n/a	25Hz
Leak (L/sec)	0.02	0–5	60	2
Minute Ventilation (L/min)	0.1	0–180	n/a	2
Therapy Pressure (cm H_2O)	0.2	4–20	60	2
Pulse Rate (beats/min)[1]	1	18–300	n/a	5
Snore	n/a	Quiet to loud	n/a	2
SpO_2 (%)[1]	1	0–100	n/a	1

1. Only available if an oximeter is used with the S9 device.

Glossary

Apnea

An apnea is the temporary absence or cessation of breathing. An apnea is scored when there is reduction in breathing by 75% of the baseline breathing for at least 10 seconds.

ResScan shows three types of apneas:

- **Central Apnea**
  A central apnea is an apnea during which the upper airway remains open.
- **Obstructive Apnea**
  An obstructive apnea is an apnea during which there is a physical closing of the upper airway.
- **Unknown Apnea**
  An unknown apnea is an apnea during which a leak higher than 30 L/min occurs, precluding accurate determination of whether the apnea is obstructive or central.

Apnea Indices

For all indices, the value shown for Statistics is the total number of events divided by Daily Usage.

- **AHI — Apnea–Hypopnea Index**
  The total number of events is calculated by adding the number of apnea and hypopnea events.

  For graphs, the AHI count is incremented at the occurrence of every event and reset every hour.
- **AI – Apnea Index**
- **HI – Hypopnea Index**
- **CAI – Central Apnea Index**
- **OAI – Obstructive Apnea Index**
- **UAI – Unknown Apnea Index**

Daily Usage

Daily Usage is total usage in a single session (a session starts at midday and finishes 24 hours later).

- **Average Daily Usage**
  Average daily usage is the result of the sum of Daily Usage divided by Used Days, over a selected time period.
- **Median Daily Usage**
  Median Daily Usage is the middle value for daily usage, where values for Daily Usage are listed from low to high, over a selected time period. While a few exceptionally high or low values can have a significant influence on an average measure, the median is typically more reflective of the true central tendency.

Events

An event is the occurrence of a residual apnea or hypopnea.

Events are recorded as they occur. The maximum number of events stored per session is 500.

Flow

Flow is an estimate of the airflow entering the lungs.

It is derived by taking the total flow and then removing the leak and mask vent flow components.

Flow Limitation

Flow Limitation is a measure of partial upper airway obstruction.

This measure is based on the shape of the inspiratory flow–time curve. A flat shape suggests upper airway obstruction.

Hypopnea

A hypopnea is an episode of shallow breathing during sleep. A hypopnea is scored when there is a reduction in breathing by 50% of baseline breathing with partial upper airway obstruction for 10 seconds or more. The event is scored after 10 seconds of the hypopnea.

Leak

Leak is an estimate of the total rate of air escaping due to mouth and mask leaks.

It is derived by analyzing the inspiratory and expiratory airflows, together with the expected mask vent flows.

High or changing leak rates may affect the accuracy of other measurements.

Minute Ventilation

Minute ventilation is the volume of air breathed in (or out) within any 60-second period.

Pulse Rate

The number of heart beats in a 60-second time frame. The pulse rate is calculated by an attached oximeter.

Snore Index

Snore index is a measure based on the amplitude of the pressure wave generated by a patient's snoring.

SpO_2

SpO_2 is a measure of the saturation of blood hemoglobin with oxygen, expressed as a percentage. The oxygen saturation is calculated by an attached oximeter.

Therapy Pressure

In CPAP mode, therapy pressure is the set CPAP pressure. In AutoSet mode, therapy pressure is the pressure derived by the AutoSet algorithm.

Tidal Volume

Tidal volume is the volume of air inspired or expired in one respiratory cycle (breath).

Total Hours Used

Total hours used is the total patient usage over a selected time range.

Usage

Usage is the length of time that a patient receives therapy from the device.

The start and end times of the first ten individual periods of usage are available for each session when using ResScan.

Used Days

Used days is the total number of days during which daily usage exceeded the compliance threshold (X hours Y minutes).

% Used Days

% used days calculates the percentage of used days out of the total number of days selected.

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