By generating random changes in inspiratory pressure, Variable Pressure Support (Variable PS) mimics the subtle variability of normal breathing. Improved pulmonary function and a reduced risk of ventilator-associated lung injury (VALI) are the main potential effects of this gentle variation. Patients feel more comfortable and there are fewer adjustments to the ventilator settings.
Variable Pressure Support

Breathing is a cyclic activity with variable inspiratory and expiratory phases. It is almost impossible to observe two spontaneous breaths with exactly the same characteristics. This variability of spontaneous breathing is called "noise".

Controlled mechanical pressure support ventilation is even characterized by fixed support level. To provide a more physiological respiratory pattern and to improve outcome, the option of Variable PS mimics noise of the nature. It generates random variation values in pressure support levels and then applies those values to the pressure support delivered to the patient. Finally, biologically variable ventilation or "noisy pressure support" seems to improve oxygenation and lung function.

Variation of ventilation follows a random function

The addition of noise (random changes) to a monotonously treated nonlinear biological system, such as the lung, induces stochastic resonance that contributes to the recruitment of collapsed alveoli and atelectasis in the lung segments. This random variation is based on the variability according to Gaussian normal distribution.

The level of Variable PS breaths follows a random function according to a Gaussian distribution. Regardless of the patient’s spontaneous breathing effort, Variable PS therefore induces tidal volume variation. The variation is performed for every single breath. To make it easier for the user, the variability in Variable PS can be set directly in percent: “Press. Var. %”. Settings for “PEEP” and “ΔPS” remain the same.

The amount of variation desired can be adjusted from 0 to 100%. The maximum possible variation is limited by the set Paw high alarm threshold. If the variation level is set 100%, the maximum possible pressure is the PS-level + 100%. The minimum possible pressure is limited to the set CPAP level. Variable PS does not lead to increased mean airway pressure. Resultant mean values for inspiratory and expiratory tidal volumes are displayed.

The option can be used in conjunction with Automatic Tube Compensation (ATC®) and Apnea Ventilation.

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5. Wysocki M et al.; Reduced breathing variability as a predictor of unsuccessful patient separation from mechanical ventilation.; Crit Care Med. 2006
“More homogenous ventilation, surfactant production and pulmonary perfusion without negative hemodynamic effects of elevated intrathoracic pressures.” 

“More natural breathing with improved patient ventilation synchrony.”

**CUSTOMER INSIGHTS**

“Variable Pressure Support ventilation could improve lung mechanics and thus unload the respiratory muscles at the same support level.”

Dr. Tommaso Mauri,
Milan, Italy

“Variable pressure support could replace traditional pressure support ventilation.”

Prof. Dr. med. habil.
Marcelo Gama de Abreu, DEWA

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**Pressure support variability 25%**

![Pressure support variability 25% diagram](image)

**Pressure support variability 50%**

![Pressure support variability 50% diagram](image)

**Pressure support variability 100%**

![Pressure support variability 100% diagram](image)
Variable Pressure Support is available for the following Dräger ventilators:

![Dräger Evita V800](image1)  ![Dräger Evita V600](image2)  ![Evita® Infinity V500*](image3)

* Infinity Acute Care System Workstation Critical Care

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**TECHNICAL DATA**

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<th>Supplement for</th>
<th>SPN-CPAP/PS (in invasive mode only)</th>
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<td>Adjustable</td>
<td>0-100%</td>
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