

## Options for spontaneous breathing

Let your patients breathe spontaneously at any time during mechanical ventilation with the options PC-SIMV+, PC-APRV\*, VC-MMV\* and AutoFlow®.

- Savina® 300 Select
- Savina® 300 Classic



### The advantages of the PC-SIMV+, PC-APRV, VC-MMV and AutoFlow options:

- Reduced invasiveness
- Improved ventilation
- Less need for sedation
- Lung protective ventilation
- Effective, continuous weaning

### MASTERING THE CHALLENGES OF MECHANICAL VENTILATION Avoiding trauma

The improper setting of mechanical ventilation may lead to distension of the lungs beyond normal physiological limits. Pulmonary pathology and concomitant critical illness can increase the stresses within the lung tissue even further. These unnaturally high pressures can lead to compromised hemodynamic and reduced pulmonary perfusion, which in turn can limit gas exchange. Modern ventilation strategies can help minimize these effects by reducing invasiveness.

### Activating problem zones

Another challenge involves the basal segments of the lung – the problem zones of mechanical ventilation. Due to their peripheral location, it is often difficult to aerate them effectively with mechanical

ventilation. Spontaneous breathing can help improve the ventilation of these areas. It has been shown<sup>1,2</sup> that spontaneous respiration can recruit alveoli in atelectatic regions of the lung, which in turn improves gas exchange and reduces intrapulmonary shunting.

### Letting your patient breathe

During conventional mechanical ventilation, the ventilator may not allow the patient to breathe spontaneously. Breathing efforts by the patient are often considered to be disruptive in these modes and are usually controlled by sedation. In contrast, modern ventilation strategies allow spontaneous breathing at any time, helping to stimulate the patient's respiratory drive. This can help to reduce weaning times.<sup>2</sup>

### Protecting the lung

By increasing the ratio of spontaneous to mechanical respiration, mean airway pressures can be reduced. Ventilation is less invasive and consistent, lung protective ventilation becomes possible. Spontaneous breathing translates to less stress for the patient, thereby reducing the need for sedation and weaning times.



Savina® 300 Select /  
Savina® 300 Classic

\*not available for Savina® 300 Classic



- The improvement of gas exchange is the primary goal of any ventilation strategy in critically ill patients.
- Spontaneous breathing has inherent advantages that lead to an increase in alveolar recruitment and pulmonary perfusion.
- Highly homogeneous gas distribution within the lungs, together with stable hemodynamics, lead to improved organ oxygenation.

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**PHYSIOLOGICAL CONDITIONS AS SOON AS POSSIBLE**

With the PC-SIMV+, PC-APRV, VC-MMV and AutoFlow option, your patients breathe freely during mechanical ventilation. This highly sensitive system encourages your patients to breathe at any time during the ventilation cycle and at any pressure level.

**Optimizing gas distribution, avoiding barotrauma**

PC-SIMV+ and AutoFlow deliver air with decelerating flow. This allows for slow areas of the lung to have enough time

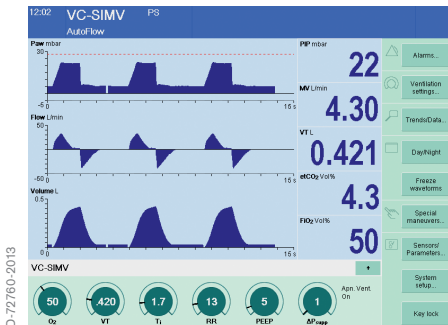
for effective gas exchange while more compliant areas of the lung are not over-distended. The avoidance of biotrauma and optimization of gas distribution within the

lung is an important contribution to a lung protective ventilation strategy.

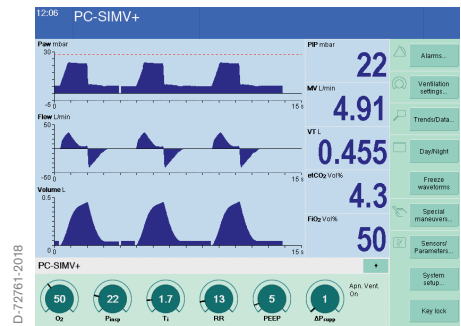
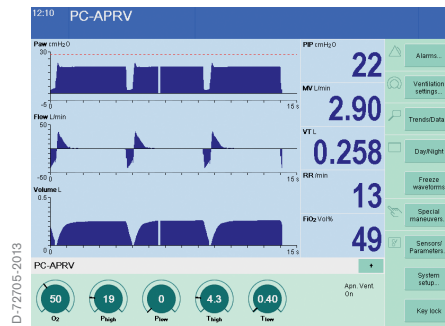
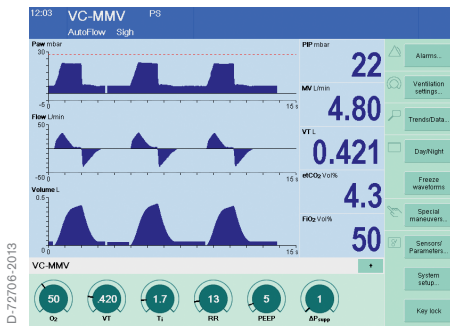
**OPTION AUTOFLOW**

Pulmonary mechanics can often change during the course of treatment, making the continuous adjustment of ventilation parameters necessary. The Dräger AutoFlow option offers automatic flow and pressure regulation in combination with the VC-AC, VC-CMV, VC-SIMV and VC-MMV ventilation modes. The pressure is adjusted according to compliance values, while the flow profile reacts to

changes in resistance. The result is a homogeneous gas distribution with the lowest possible inspiratory pressures and guaranteed minute volumes. Local shear forces are reduced and dead space ventilation is largely avoided. As manual adjustments are no longer necessary, ICU staff saves valuable time.



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Ventilation displays on page 2 and 3 are Savina® 300 screens

**OPTION VC-MMV**

VC-MMV facilitates that the patient always receives at least the set minute volume MV. The patient can always breathe spontaneously at PEEP level.

As patient activity increases, VC-MMV automatically and gradually reduces the number of time cycled strokes.

Therefore, it can be used well to facilitate weaning of uncomplicated postoperative patients. In combination with AutoFlow, the pressure is reduced in accordance with the contribution of the patient to the set tidal volume. VC-MMV with AutoFlow allows automatic weaning by frequency and inspiratory pressure.

**OPTION PC-APRV**

The clinical use of PC-APRV has been shown to facilitate spontaneous breathing and is associated with decreased peak airway pressures and improved oxygenation/ventilation when compared with conventional ventilation. Additionally, improvements in hemodynamic parameters, splanchnic perfusion, and reduced sedation/neuromuscular blocker requirements have been reported.

PC-APRV may offer potential clinical advantages for ventilator management of acute lung injury/acute respiratory distress syndrome and may be considered as an alternative “open lung approach” to mechanical ventilation<sup>3</sup>.

**OPTION PC-SIMV+**

Weaning with the Savina 300 in PC-SIMV+ mode is continuous – from the moment of intubation until the patient is extubated. The decisive advantage of this mode is the smooth, automatic transition between mechanical ventilation and natural, spontaneous breathing in a single mode. It’s no longer necessary to manually switch between modes, which simplifies the weaning process and increases the efficacy of therapy. The patient is motivated to assume the work of breathing as soon as possible, further accelerating recovery.

**References**

1. Putensen C, Mutz N J, Putensen-Himmer G, Zinserling J. Am J Resp and CC Medicine, Vol. 159, 1999
2. Baum, Benzer, Putensen, Koller, Putz. Anaesthetists 38, 452 - 458, 1999
3. Habashi Crit Care Med 2005 Vol. 33, No. 3 (Suppl.)

The options PC-SIMV+, PC-APRV, VC-MMV and AutoFlow provide the next step in protective lung ventilation. These options give your patients room to breathe, encourage them to progress and adjust automatically to changes in pulmonary mechanics. For your patients, this means less stress and quicker recovery.

For ICU staff, workflow is simplified, saving both valuable time and effort.

## TECHNICAL DATA

### PC-SIMV+

### Savina® 300 Select / Savina® 300 Classic

Pressure Control-Synchronized Intermittent Mandatory Ventilation (PC-SIMV+)

$P_{insp}$	1 to 99 mbar / 1 to 99 mbar
PEEP	0 to 50 mbar / 0 to 50 mbar
$\Delta P_{supp}$ (pressure support over PEEP)/Pressure support $P_{supp}$	0 to 50 mbar / 0 to 50 mbar
$T_i$	0.2 s to 10 / 0.2 s to 10
RR	2 /min to 80 /min / 2 /min to 80 /min
FlowAcc (flow acceleration)/Slope (Rise time for pressure support)	5 to 200 mbar/s / 5 to 200 mbar/s

### PC-APRV

### Savina® 300 Select / Savina® 300 Classic

Pressure Control-Airway Pressure Release Ventilation, spontaneous breathing under continuous positive airway pressure with brief pressure releases

Inspiratory time Thigh	0.2 to 22.0 s / ---
Expiratory time Tlow	0.1 to 22.0 s / ---
Inspiratory pressure Phigh	1 to 95 mbar (or hPA or cmH <sub>2</sub> O) / ---
Expiratory pressure Plow	1 to 95 mbar (or hPA or cmH <sub>2</sub> O) / ---

### AutoFlow

Available in conjunction with all volume controlled ventilation modes VC-CMV, VC-AC, VC-SIMV and VC-MMV (optional)

Performance features:

- Automatic flow adjustment and ventilation pressure adjustment to the smallest possible value with constant tidal volume.
- Spontaneous breathing at any time during the respiration cycle.

### Ordering information

### Savina® 300 Select / Savina® 300 Classic

Option	PPC-SIMV+	84 17 800 / 84 17 800
Retrofit Kit	PC-SIMV+	84 14 150 / 84 14 150
Option	AutoFlow	84 17 800 / 84 17 800
Retrofit Kit	AutoFlow	84 14 150 / 84 14 150
Option	PC-APRV	84 17 800 / ---
Retrofit Kit	PC-APRV	84 14 150 / ---
Option	VC-MMV	84 17 800 / ---
Retrofit Kit	VC-MMV	84 14 150 / ---

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