Non invasive ventilation & High Flow therapy
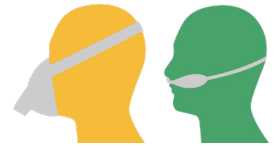
– Servo-air short guide

On/Off switch

Gas inlet for O₂

Batteries
At least one battery module must always be installed. The battery compartment is divided into two slots, optional (1) and main (2).
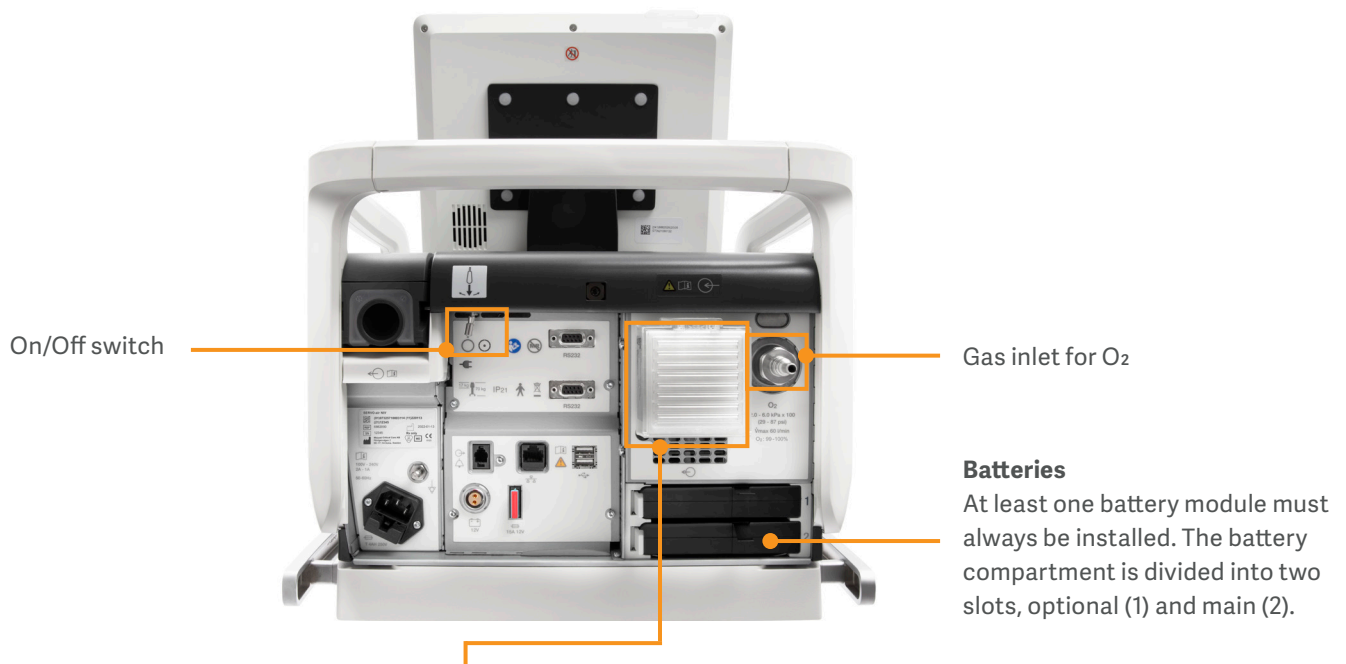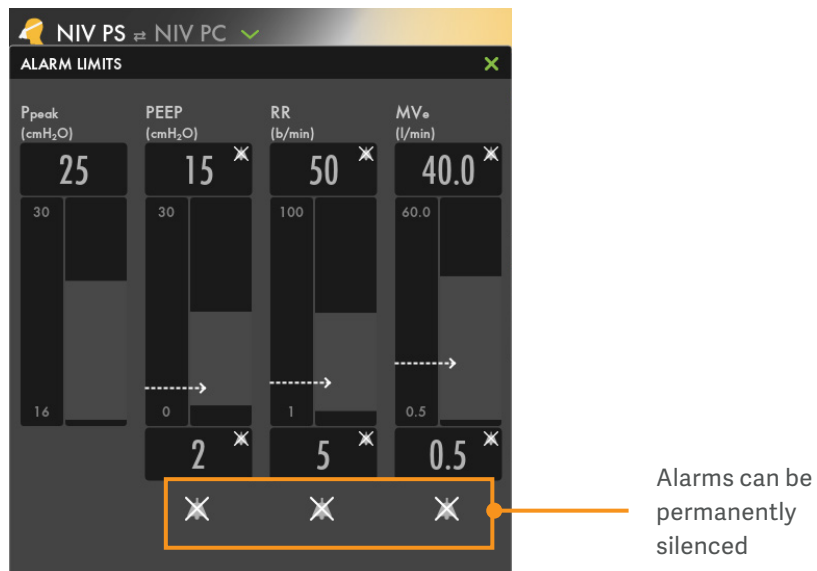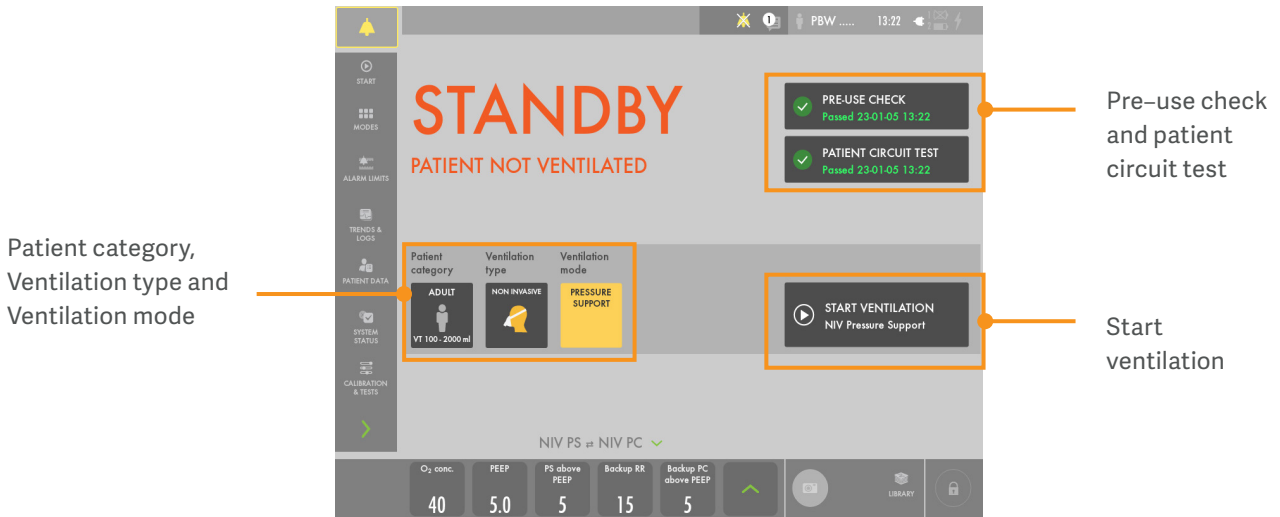
Air inlet filter must be replaced once per year.
Dust filter (inside), must be replaced at least once per month.

Patient circuit set up

Non invasive ventilation when using active humidifier.

Pre–use check
and patient
circuit test

STANDBY
PATIENT NOT VENTILATED

START

MODES

ALARM LIMITS

TRENDS & LOGS

PATIENT DATA

SYSTEM STATUS

CALIBRATION & TESTS

PRE-USE CHECK
Passed 23-01-05 13:22

PATIENT CIRCUIT TEST
Passed 23-01-05 13:22

Patient category,
Ventilation type and
Ventilation mode

Patient category	Ventilation type	Ventilation mode
ADULT	NON INVASIVE	PRESSURE SUPPORT
VT 100 - 2000 ml		

START VENTILATION
NIV Pressure Support

Start
ventilation

NIV PS ⇌ NIV PC

O₂ conc.	PEEP	PS above PEEP	Backup RR	Backup PC above PEEP
40	5.0	5	15	5

LIBRARY

Alarm silence

Tap on the alarm message, the alarm
management checklist is shown.

Respiratory rate high

PBW 13:31

NIV PS ⇌ NIV PC

Standby/Stop
ventilation

STANDBY

DISCONNECTION

Ventilation
modes

MODES

ALARM LIMITS

Alarm limits

TRENDS & LOGS

MANEUVERS

VIEWS

Paw cmH₂O

Ppeak
11
cmH₂O
25

RR
20
b/min
18
5

Tap on the active
alarm and you can
adjust the alarms
limits directly.

FLOW l/min

MV₀
18.7
l/min
40.0
10.5

O₂ conc.
39

V ml

Leakage
52

Leakage %

O₂ boost

100
O₂ BOOST

O₂ conc.	PEEP	PS above PEEP	Backup RR	Backup PC above PEEP
40	5.0	5	15	5

LIBRARY

Direct access to ventilation settings

NIV PS ⇌ NIV PC

ALARM LIMITS

Ppeak (cmH₂O)	PEEP (cmH₂O)	RR (b/min)	MV₀ (l/min)
25	15	50	40.0
30	30	100	60.0
16	0	1	0.5
	2	5	0.5

Alarms can be
permanently
silenced

Ventilation modes and settings

Ventilation mode	Breath types	Trigger sensitivity	Inspiratory Pressure	Inspiratory Time	End inspiration	Backup ventilation
NIV PS (Pressure Support)	Support/ Control (Backup PC)	Automatic (Flow/Volume or Pressure)	PS above PEEP/ Backup PC above PEEP	Set for PC Backup (in sec or I:E ratio)	Set % of peak inspiratory flow, or pressure cycled	Backup PC based on set Apnea time
NIV PS (CPAP)*	Spontaneous/ Control (Backup PC)	Automatic (Flow/Volume or Pressure)	PS above PEEP set to zero/ Backup PC above PEEP	Set for PC Backup (in sec or I:E ratio)	Set % of peak inspiratory flow, or pressure cycled	Backup PC based on set Apnea time
NIV PC (Pressure Control)	Assist/ Control	Automatic (Flow/Volume or Pressure)	PC above PEEP	Set for PC Assist/ Control (in sec or I:E ratio)	Time cycled	N/A
High Flow therapy	Spontaneous	N/A	N/A	N/A	N/A	N/A

* CPAP – Set PS above PEEP level to zero (0).

Disconnection flow and configuration options

Standby/Biomed/Configuration/Start up configuration it is possible to choose different NIV disconnection functionalities when the leakage exceeds 95%.

| Disabled	High flow	Low flow
The ventilation will continue even when leakage is excessive (> 95%)	The ventilation will be paused and a constant flow of 40 l/min in Adult category and in pediatric category 15 l/min, will be delivered.	The ventilation will be paused and a constant flow of 7.5 l/min will be delivered.
Alarms: Yellow – Medium priority "Leakage too high" alarm	Alarms: Red – High priority "Leakage too high" alarm A dialogue appears. "Leakage detected"	Alarms: Red – High priority "Leakage too high" alarm A dialogue appears "Leakage detected"

Nebulization

Nebulization may be used during Non invasive ventilation and High Flow therapy. The Aerogen nebulizer can be placed at the Y piece or between the inspiratory tube and the dry side of the humidifier.

NIV PS

- The PS breath is initiated by the patient. The patient controls the respiratory rate and partially the tidal volume.

- Delivers ventilator support using the preset pressure level and with a decelerating flow.

- The Trigger sensitivity is automatically set and leakage compensated. Trigger criteria are based on flow/volume or pressure.

- The Inspiratory Rise Time setting determines the time for the inspiratory pressure to reach the set value.

- The termination of breath delivery is determined by the End Inspiratory setting. It represents the percentage of peak inspiratory flow. The higher the End Inspiratory setting the shorter the inspiratory phase.
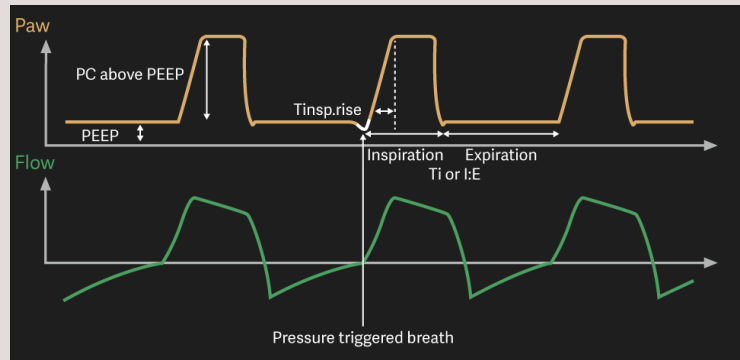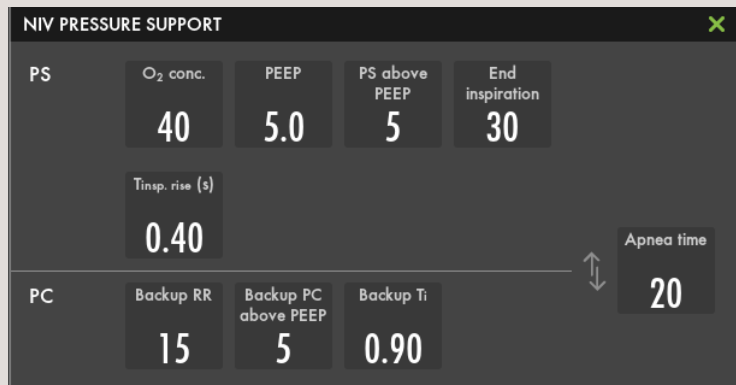

NIV PC

- Delivers a constant pressure over a preset inspiratory time and at a preset respiratory rate.

- Delivers the inspiratory pressure with a decelerating flow pattern.

- Changes in lung or thorax resistance or compliance will affect the volume delivered.

- The patient can also trigger a Pressure Controlled breath (i.e. assisted breath). Trigger criteria are based on flow/volume or pressure.
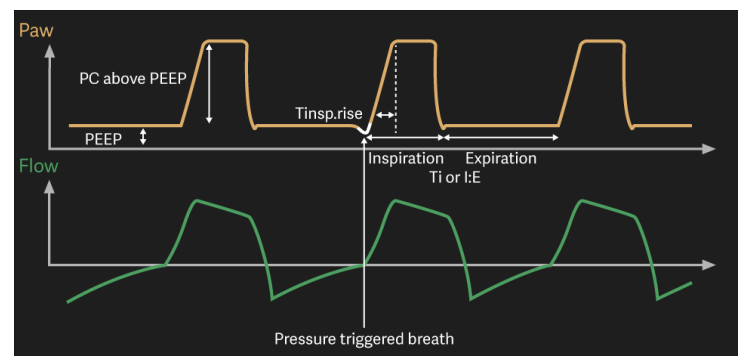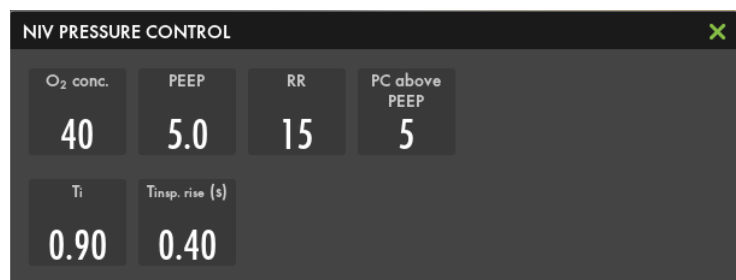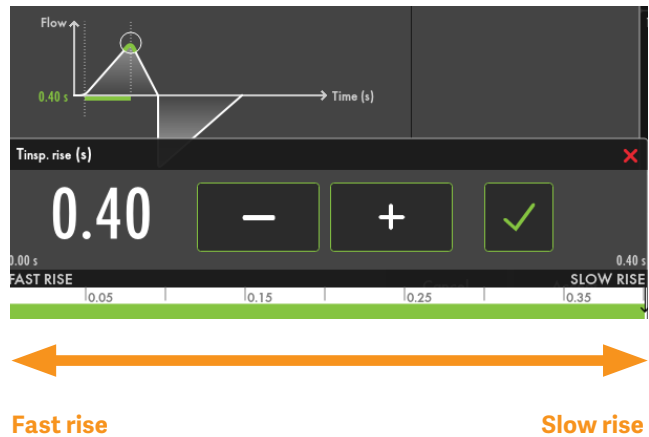
Settings

Trigger

In NIV the trigger sensitivity is automatically adjusted, by flow/volume or pressure. You can see how the breath is triggered by the white indication in the waveforms.

Pressure triggered breaths

Flow/volume triggered breaths
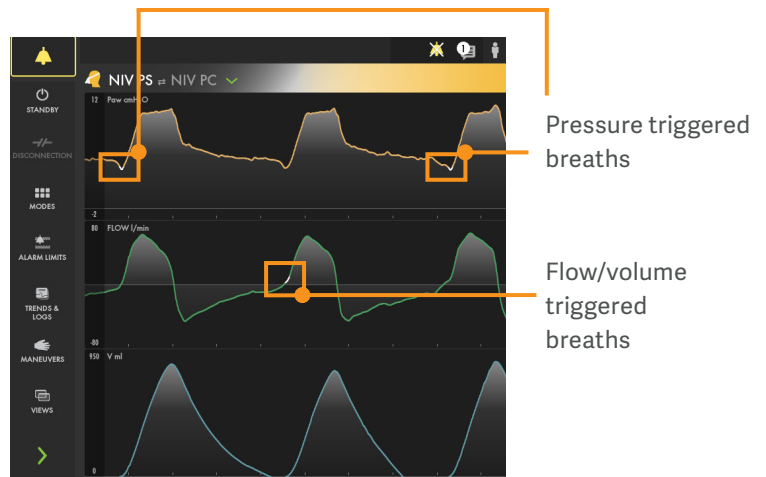
Inspiratory rise time

The Inspiratory rise time (Tinsp.rise) is the time to reach the set pressure target (PS above PEEP). The Tinsp.rise time may be increased to enhance patient comfort.

**Fast rise**   **Slow rise**

End inspiration

Duration of inspiration can be adjusted using the End inspiration setting.

End inspiration is set to assure patient-ventilator synchronization and comfort.

End inspiration can be set 10 – 70%

- if set too low, inspiration will be longer, which may cause pulmonary hyperinflation and increased work of breathing.

- if set too high, inspiration will be shorter, which may mean that the patient receives insufficient tidal volume.
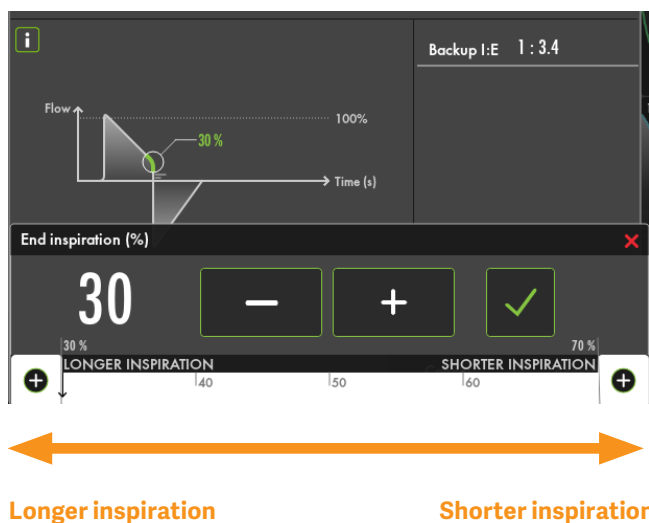
e.g. For a COPD patient, a lower end inspiration setting may improve synchronization and comfort.

Longer inspiration   **Shorter inspiration**

Setting up NIV
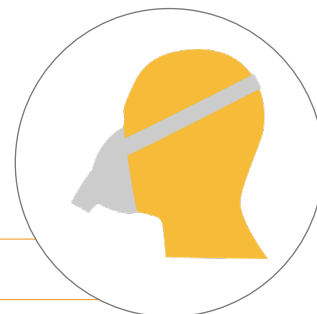
1 Plug in the power cord, connect the oxygen hose and switch ON the ventilator.

2 Start the PRE-USE CHECK. Follow on-screen instructions (you need the test tube during the pre-use check). The patient circuit test is included in the pre-use check.

3 Choose PATIENT CATEGORY: Adult or Pediatric.

4 Choose VENTILATION TYPE: Non invasive.

5 Tap VENTILATION MODES

6 Choose ventilation mode and adjust the settings. Start with low PEEP and PS/PC above PEEP.

7 Set the desired alarm limits in the alarm window. Certain alarms can be permanently silenced.

8 Tap START VENTILATION, a waiting position dialog is displayed. In this position, ventilation will start if the ventilator system detects patient activity.

9 If using a mask, hold the mask with one hand to minimize leakage for the first NIV breaths. This will allow early accurate monitoring and assessment of tidal volumes.

10 Secure the interface appropriately, e.g. with head straps.

11 Increase the support in steps of 1 cmH$_2$O. Titrate the End inspiration and Inspiratory rise time to achieve good patient synchrony and comfort.

Stop NIV and go to standby

1 Remove the patient interface from the patient.

2 Tap the standby symbol up in the left corner on the screen.

3 Tap and hold to go to Standby.

High Flow therapy

Delivers a set flow of heated and humidified gas with a set concentration of oxygen to the patient. The patient must be breathing spontaneously.

Flow settings ranges:
Adult: 5-60 l/min **Pediatric:** 2-30 l/min
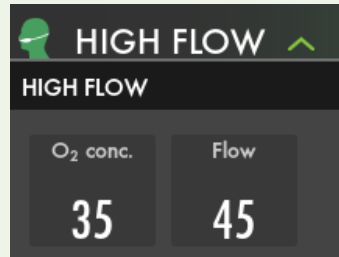
Alarms

No alarms to be set in High Flow. Two alarms are available in High Flow.

Flow through expiratory tube

If the patient circuit is connected to the expiratory inlet the alarm "Flow through expiratory tube" will be activated.
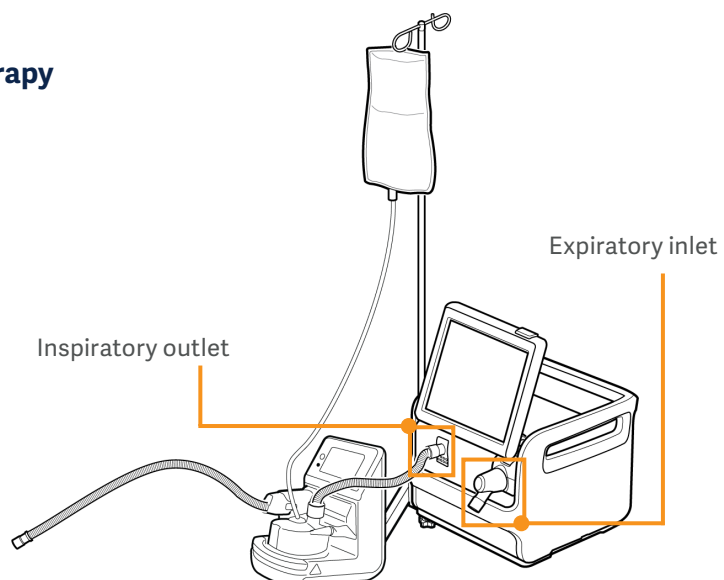

Inspiratory pressure high

If an occlusion occurs, the "Inspiratory pressure high" alarm will be activated.

Patient circuit set up High Flow therapy

1) Connect the patient circuit to the inspiratory outlet and the humidifier.

2) Connect the high-flow nasal cannula to the patient circuit.

Inspiratory outlet

Expiratory inlet

Refer to User´s manual for more detailed information.

This document is intended to provide information to an international audience outside of the US. Servo-air may be pending regulatory approvals to be marketed in your country. Contact your Getinge representative for more information.
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