



Because **OUTCOMES** matter
BEYOND the **NICU.**



fabianTM family of ventilators

TECHNICAL SPECIFICATION E-BOOK

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fabian™ Family
of Ventilators

Finding Your
Device

fabian™
Therapy

fabian™
+nCPAP

fabian™
HFO

HFO

FOT

PRICO

Volume
Guarantee



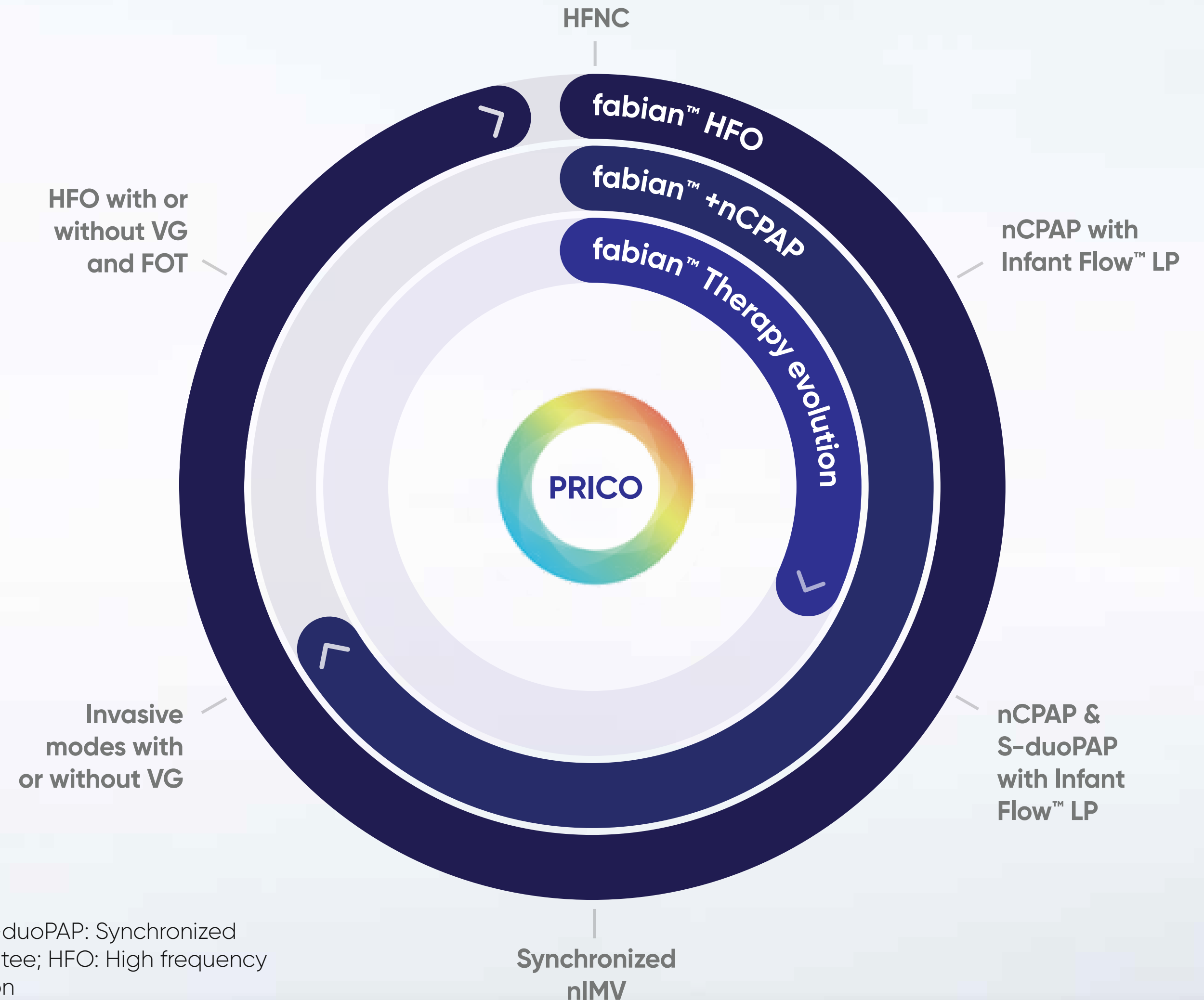
For every baby under your care

There is a fabian™ device that meets their specialized respiratory needs.

fabian™ ventilation devices deliver vital care across the entire neonatal acuity spectrum—from the newborn who needs help after a complicated delivery to the most fragile premature baby in the NICU.

Designed for improving your workflow and budget, the fabian™ ventilator empowers the clinician to maintain the highest level of care as the infant's condition and needs change.

Evolution of therapy as required to meet the infant's condition



HFNC: O₂ therapy-High flow nasal cannula; nCPAP: Nasal continuous positive airway pressure; S-duoPAP: Synchronized duo positive airway pressure; nIMV: Nasal intermittent mandatory ventilation; VG: Volume Guarantee; HFO: High frequency oscillation; FOT: Forced Oscillation Technique; PRICO: Predictive Intelligent Control of Oxygenation

The fabian™ family of ventilators

Our total commitment to respiratory care is reflected in the comprehensive solutions we offer, ensuring appropriate care is readily available.

To optimize outcomes in the NICU, you need ventilation devices that help both vulnerable newborns and overburdened care teams breathe easier. No matter which product you choose, you're getting a device that features the latest technology and is ready to ventilate across the continuum of care.



fabian™ Therapy evolution



fabian™ +nCPAP evolution



fabian™ HFO

Compare fabian™ models and see how they differ in features, modes and more.

[COMPARE](#)



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CLICK BUTTONS TO TURN
FEATURES **ON/OFF**



● **fabian™ Therapy evolution**



● **fabian™ +nCPAP evolution**



● **fabian™ HFO**



Main Features

O₂ Monitor (*FiO₂*)

Electronic Gas Blender

Inspiratory and Expiratory Flow (*Bias*)

Leak Compensation

Integrated Battery

Color TFT Display

Touch-screen Display

Volume Trigger/Flow Trigger/Pressure Trigger

Curves: Pressure

Curves: Pressure/Volume/Flow

Loops: F/P, P/V

Advanced Monitoring

CO₂ Module (*Side or Main-stream*)

SpO₂ Module (*Masimo*)

PRICO

PDMS

FOT

Ventilation Modes

CPAP

IPPV-IMV

SIPPV (A/C)

SIMV

SIMV + PSV

NIV (*nCPAP, duoPAP*)

NIV Trigger

HFO

Volume Limit

Volume Guarantee

O₂ High Flow Therapy

O₂ Flush

Manual Breath

● = standard ○ = optional

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● **fabian™ Therapy evolution**



● **fabian™ +nCPAP evolution**



● **fabian™ HFO**



Main Features

	fabian Therapy evolution
O ₂ Monitor (<i>FiO₂</i>)	●
Electronic Gas Blender	●
Inspiratory and Expiratory Flow (<i>Bias</i>)	-
Leak Compensation	●
Integrated Battery	●
Color TFT Display	●
Touch-screen Display	●
Volume Trigger/Flow Trigger/Pressure Trigger	○
Curves: Pressure	●
Curves: Pressure/Volume/Flow	○
Loops: F/P, P/V	-

Advanced Monitoring

CO ₂ Module (<i>Side or Main-stream</i>)	-
SpO ₂ Module (<i>Masimo</i>)	○
PRICO	○
PDMS	○
FOT	-

Ventilation Modes

	fabian Therapy evolution
CPAP	-
IPPV-IMV	-
SIPPV (A/C)	-
SIMV	-
SIMV + PSV	-
NIV (<i>nCPAP, duoPAP</i>)	●
NIV Trigger	○
HFO	-
Volume Limit	-
Volume Guarantee	-
O ₂ High Flow Therapy	●
O ₂ Flush	●
Manual Breath	●

● = standard ○ = optional

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● **fabian™ +nCPAP evolution**



● **fabian™ HFO**



	fabian Therapy evolution	fabian +nCPAP evolution
Main Features		
O ₂ Monitor (<i>FiO₂</i>)	●	●
Electronic Gas Blender	●	●
Inspiratory and Expiratory Flow (<i>Bias</i>)	-	●
Leak Compensation	●	●
Integrated Battery	●	●
Color TFT Display	●	●
Touch-screen Display	●	●
Volume Trigger/Flow Trigger/Pressure Trigger	○	●
Curves: Pressure	●	-
Curves: Pressure/Volume/Flow	○	●
Loops: F/P, P/V	-	●
Advanced Monitoring		
CO ₂ Module (<i>Side or Main-stream</i>)	-	-
SpO ₂ Module (<i>Masimo</i>)	○	○
PRICO	○	○
PDMS	○	○
FOT	-	-

	fabian Therapy evolution	fabian +nCPAP evolution
Ventilation Modes		
CPAP	-	●
IPPV-IMV	-	●
SIPPV (A/C)	-	●
SIMV	-	●
SIMV + PSV	-	●
NIV (<i>nCPAP, duoPAP</i>)	●	●
NIV Trigger	○	○
HFO	-	-
Volume Limit	-	●
Volume Guarantee	-	●
O ₂ High Flow Therapy	●	●
O ₂ Flush	●	●
Manual Breath	●	●

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● **fabian™ Therapy evolution**



● **fabian™ +nCPAP evolution**



● **fabian™ HFO**



Main Features

	fabian Therapy evolution	fabian +nCPAP evolution	fabian HFO
O ₂ Monitor (<i>FiO₂</i>)	●	●	●
Electronic Gas Blender	●	●	●
Inspiratory and Expiratory Flow (<i>Bias</i>)	-	●	●
Leak Compensation	●	●	●
Integrated Battery	●	●	●
Color TFT Display	●	●	●
Touch-screen Display	●	●	●
Volume Trigger/Flow Trigger/Pressure Trigger	○	●	●
Curves: Pressure	●	-	-
Curves: Pressure/Volume/Flow	○	●	●
Loops: F/P, P/V	-	●	●

Advanced Monitoring

CO ₂ Module (<i>Side or Main-stream</i>)	-	-	○
SpO ₂ Module (<i>Masimo</i>)	○	○	○
PRICO	○	○	○
PDMS	○	○	○
FOT	-	-	○

Ventilation Modes

	fabian Therapy evolution	fabian +nCPAP evolution	fabian HFO
CPAP	-	●	●
IPPV-IMV	-	●	●
SIPPV (A/C)	-	●	●
SIMV	-	●	●
SIMV + PSV	-	●	●
NIV (<i>nCPAP, duoPAP</i>)	●	●	●
NIV Trigger	○	○	○
HFO	-	-	●
Volume Limit	-	●	●
Volume Guarantee	-	●	●
O ₂ High Flow Therapy	●	●	●
O ₂ Flush	●	●	●
Manual Breath	●	●	●

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● **fabian™ HFO**



Main Features

	fabian +nCPAP evolution	fabian HFO
O ₂ Monitor (<i>FiO₂</i>)	●	●
Electronic Gas Blender	●	●
Inspiratory and Expiratory Flow (<i>Bias</i>)	●	●
Leak Compensation	●	●
Integrated Battery	●	●
Color TFT Display	●	●
Touch-screen Display	●	●
Volume Trigger/Flow Trigger/Pressure Trigger	●	●
Curves: Pressure	-	-
Curves: Pressure/Volume/Flow	●	●
Loops: F/P, P/V	●	●

Advanced Monitoring

CO ₂ Module (<i>Side or Main-stream</i>)	-	○
SpO ₂ Module (<i>Masimo</i>)	○	○
PRICO	○	○
PDMS	○	○
FOT	-	○

Ventilation Modes

	fabian +nCPAP evolution	fabian HFO
CPAP	●	●
IPPV-IMV	●	●
SIPPV (A/C)	●	●
SIMV	●	●
SIMV + PSV	●	●
NIV (<i>nCPAP, duoPAP</i>)	●	●
NIV Trigger	○	○
HFO	-	●
Volume Limit	●	●
Volume Guarantee	●	●
O ₂ High Flow Therapy	●	●
O ₂ Flush	●	●
Manual Breath	●	●

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Main Features

	fabian Therapy evolution	fabian HFO
O ₂ Monitor (<i>FiO₂</i>)	●	●
Electronic Gas Blender	●	●
Inspiratory and Expiratory Flow (<i>Bias</i>)	-	●
Leak Compensation	●	●
Integrated Battery	●	●
Color TFT Display	●	●
Touch-screen Display	●	●
Volume Trigger/Flow Trigger/Pressure Trigger	○	●
Curves: Pressure	●	-
Curves: Pressure/Volume/Flow	○	●
Loops: F/P, P/V	-	●

Advanced Monitoring

CO ₂ Module (<i>Side or Main-stream</i>)	-	○
SpO ₂ Module (<i>Masimo</i>)	○	○
PRICO	○	○
PDMS	○	○
FOT	-	○

Ventilation Modes

	fabian Therapy evolution	fabian HFO
CPAP	-	●
IPPV-IMV	-	●
SIPPV (A/C)	-	●
SIMV	-	●
SIMV + PSV	-	●
NIV (<i>nCPAP, duoPAP</i>)	●	●
NIV Trigger	○	○
HFO	-	●
Volume Limit	-	●
Volume Guarantee	-	●
O ₂ High Flow Therapy	●	●
O ₂ Flush	●	●
Manual Breath	●	●

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● **fabian™ Therapy evolution**



● **fabian™ +nCPAP evolution**



● **fabian™ HFO**



Main Features

	fabian +nCPAP evolution
O ₂ Monitor (<i>FiO₂</i>)	●
Electronic Gas Blender	●
Inspiratory and Expiratory Flow (<i>Bias</i>)	●
Leak Compensation	●
Integrated Battery	●
Color TFT Display	●
Touch-screen Display	●
Volume Trigger/Flow Trigger/Pressure Trigger	●
Curves: Pressure	-
Curves: Pressure/Volume/Flow	●
Loops: F/P, P/V	●

Advanced Monitoring

CO ₂ Module (<i>Side or Main-stream</i>)	-
SpO ₂ Module (<i>Masimo</i>)	○
PRICO	○
PDMS	○
FOT	-

Ventilation Modes

	fabian +nCPAP evolution
CPAP	●
IPPV-IMV	●
SIPPV (A/C)	●
SIMV	●
SIMV + PSV	●
NIV (<i>nCPAP, duoPAP</i>)	●
NIV Trigger	○
HFO	-
Volume Limit	●
Volume Guarantee	●
O ₂ High Flow Therapy	●
O ₂ Flush	●
Manual Breath	●

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CLICK BUTTONS TO TURN FEATURES **ON/OFF**



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Main Features

	fabian HFO
O ₂ Monitor (<i>FiO₂</i>)	●
Electronic Gas Blender	●
Inspiratory and Expiratory Flow (<i>Bias</i>)	●
Leak Compensation	●
Integrated Battery	●
Color TFT Display	●
Touch-screen Display	●
Volume Trigger/Flow Trigger/Pressure Trigger	●
Curves: Pressure	-
Curves: Pressure/Volume/Flow	●
Loops: F/P, P/V	●

Advanced Monitoring

CO ₂ Module (<i>Side or Main-stream</i>)	○
SpO ₂ Module (<i>Masimo</i>)	○
PRICO	○
PDMS	○
FOT	○

Ventilation Modes

	fabian HFO
CPAP	●
IPPV-IMV	●
SIPPV (<i>A/C</i>)	●
SIMV	●
SIMV + PSV	●
NIV (<i>nCPAP, duoPAP</i>)	●
NIV Trigger	○
HFO	●
Volume Limit	●
Volume Guarantee	●
O ₂ High Flow Therapy	●
O ₂ Flush	●
Manual Breath	●

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Compare **fabian™** models and see how they differ in features, modes and more.

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Our expertise helps them quickly get home



Learn more about each device

 Click on each item to learn more



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A complete and highly advanced non-invasive ventilator featuring all classic and new NIV modes.

- » Feature highlights
- » Standout ventilation modes
- » Technical specification summary



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Feature highlights

 Click categories below to view content

1 NIV with leak compensation

2 NIV trigger

3 SpO₂ with Masimo SpO₂ sensor technology

4 Predictive Intelligent Control of Oxygenation (PRICO)

5 Manual inspiration

6 O₂ flush

Adjustable levels of leak compensation in nCPAP and duoPAP modes may prevent triggering and cycling asynchrony



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Feature highlights

 Click categories below to view content

1 NIV with leak compensation

2 NIV trigger

3 SpO₂ with Masimo SpO₂ sensor technology

4 Predictive Intelligent Control of Oxygenation (PRICO)

5 Manual inspiration

6 O₂ flush

NIV trigger can be enabled in nCPAP and duoPAP to provide:

- Breath detection and Apnea monitoring with Alarms
- Triggered supported breaths

Depending on the nasal interface being used, fabian will then automatically select the proper NIV Trigger Sensor:

- Flow Sensor (Neonatal) with Infant Flow and Infant Flow LP generators
- Pressure Sensor with Medijet (by Medin) generator



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Feature highlights

Click categories below to view content

1 NIV with leak compensation

2 NIV trigger

3 SpO₂ with Masimo SpO₂ sensor technology

4 Predictive Intelligent Control of Oxygenation (PRICO)

5 Manual inspiration

6 O₂ flush

You can select the sensitivity mode, enable or disable a Fast SAT mode, and set the alarm delay and the SpO₂ averaging time

Fast SAT enables rapid tracking or arterial oxygen saturation changes by minimizing the averaging. This mode is clinically applicable during procedures when detecting rapid changes in oxygen saturation is paramount such as induction, intubation, and sleep studies



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Feature highlights

 Click categories below to view content

1 NIV with leak compensation

2 NIV trigger

3 SpO₂ with Masimo SpO₂ sensor technology

4 Predictive Intelligent Control of Oxygenation (PRICO)

5 Manual inspiration

6 O₂ flush

Closed loop FiO₂-SpO₂ is an important tool that protects babies from out of target oxygen ranges. PRICO is easy to apply in all modes.

[Click here](#) to learn more about PRICO



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Feature highlights

Click categories below to view content

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3 SpO₂ with Masimo SpO₂ sensor technology

4 Predictive Intelligent Control of Oxygenation (PRICO)

5 Manual inspiration

6 O₂ flush

A manual breath can be set for 2 to 30 seconds



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Feature highlights

Click categories below to view content

1 NIV with leak compensation

2 NIV trigger

3 SpO₂ with Masimo SpO₂ sensor technology

4 Predictive Intelligent Control of Oxygenation (PRICO)

5 Manual inspiration

6 O₂ flush

Short-term Oxygen Flush with an increased O₂ concentration and duration is permissible in all ventilation modes



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Standout ventilation modes

 Click categories below to view content

1 HFNC (HFOT) – O₂ Therapy

2 nCPAP

3 duoPAP

fabian™ provides an effective high and low flow nasal cannula O₂ therapy, with adjustable flow.

O₂ Therapy is an option which allows use of a continuous flow of blended gas, between 0 to 15 LPM in NEO and 0 to 30 LPM in PED mode. fabian™ allows the use of several nasal cannulas of various makes and sizes. Alarms are suppressed during O₂ Therapy operation, except for the set FiO₂.

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fabian™ +nCPAP

fabian™ HFO

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Standout ventilation modes

 Click categories below to view content

1 HFNC (HFOT) – O₂ Therapy

2 nCPAP

3 duoPAP

Supplies positive airway pressure with automatic leak compensation if needed. The maximum leak compensation is selectable.

This mode requires a special nCPAP Patient Set with nCPAP generator. Before using the nCPAP/ duoPAP mode the correct system must be specified in the specifications menu.

The following systems currently can be used:

- Infant Flow
- Infant Flow LP
- MediJet

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fabian™ +nCPAP

fabian™ HFO

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Standout ventilation modes

 Click categories below to view content

1 HFNC (HFOT) – O₂ Therapy

2 nCPAP

3 duoPAP

duoPAP is two different pressure levels with adjustable respiratory rate and inspiratory time.

Upper inspiratory pressure is set in duoPAP mode.

The lower pressure level is selected in duoPAP mode via the CPAP parameter.

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Technical specifications

Click categories below to view content

1 Setting ranges and parameters

2 Ventilation modes

3 Enhancements

4 Special procedures

5 Dimension

6 Input and output ports

Parameter \ Mode	NCPAP		DUOPAP		O ₂ Therapy	
	min	max	min	max	min	max
I-time [sec]			0.15	15		
E-time [sec]			0.2	30		
Frequency [1/min]			2	60		
O ₂ [%]	21	100	21	100	21	100
O ₂ Flush [%]	23	100	23	100	23	100
Flush Time [sec]	0	120	0	120	0	120
Man, Breath Time [sec]	2	30	2	30		
Flow _{min} [Lpm]					0	30
CPAP [mbar]	2	13	2	13		
P _{manual} [mbar]	5	15				
PDUO [mbar]			5	15		



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Technical specifications

 Click categories below to view content

1 Setting ranges and parameters

2 Ventilation modes

3 Enhancements

4 Special procedures

5 Dimension

6 Input and output ports

Non-Invasive Ventilation (NIV) with single limb circuits: nCPAP and duoPAP with variable flow pressure generators (i.e. Infant Flow LP)

HFNC (HFOT) - O₂ Therapy

PRICO (Predictive Intelligent Control of Oxygenation), option with Masimo SpO₂ sensor technology



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Technical specifications

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1 Setting ranges and parameters

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3 Enhancements

4 Special procedures

5 Dimension

6 Input and output ports

NIV with leak compensation

NIV Trigger, for flow triggered duoPAP and Apnea detection

Flow and Volume waves in nasal CPAP

SpO₂ with Masimo SpO₂ sensor technology



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Manual inspiration/hold
(Sustained Lung Inflation)

O₂ flush

PRICO, option



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4 Special procedures

5 Dimension

6 Input and output ports

(W x H x D) 24 cm x 27 cm x 35 cm

Approx. 10 kg. HFO module

Diagonal screen size 5.7"

TFT color touch-screen with LED backlight

Keypad with 14 buttons



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6 Input and output ports

1 USB port (for SW updates)

1 RS 232 (9 pin) port for PDMS/HIS

1 RJ 45 Ethernet port for PDMS/HIS

1 nurse call connector

External trigger connector



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Includes all of the noninvasive capabilities of the fabian™ Therapy evolution, enhanced with invasive features that promote ventilator precision and synchrony.

- » Feature highlights
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- » Technical specification summary



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Feature highlights

Click categories below to view content

1 Inspiratory (I-Flow) and expiratory flow (E-Flow)

2 Volume, flow and pressure trigger

3 Graphics

4 Managing tidal volume delivery

5 Predictive Intelligent Control of Oxygenation (PRICO)

6 Connectivity

Continuous, variable flow from 1 to 32 LPM

E-Flow is separately adjustable from the inspiratory flow

E-Flow supports flushing dead space in the wye-piece and maintaining the PEEP



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6 Connectivity

Designed with a Hotwire Anemometer flow sensor

Offers volume trigger which can be valuable for indirect evaluation of patient's drive

The sensitivity of the flow trigger of 0.12 - 1.2 LPM is ideal for extremely low birthweight babies

The trigger sensitivity can be adjusted from level 1 - 10



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6 Connectivity

This model includes pressure/volume and volume/flow for better visualization of the patient's lung condition



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fabian™ +nCPAP

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PRICO


Volume Guarantee



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Feature highlights

 Click categories below to view content

- 1 Inspiratory (I-Flow) and expiratory flow (E-Flow)
- 2 Volume, flow and pressure trigger
- 3 Graphics
- 4 Managing tidal volume delivery**
- 5 Predictive Intelligent Control of Oxygenation (PRICO)
- 6 Connectivity

fabian™ +nCPAP offers volume limit (Vlimit) and volume guarantee (VG) functionality. Vlimit enables the ability to set the maximum delivered tidal volume setting. When the volume limit is reached, inspiratory phase is stopped.

The VG feature allows volume-targeted ventilation (VTV) in low birthweight neonatal patients. Compared to pressure limited ventilation, VTV keeps PaCO₂ more stable, therefore minimizing hypocarbia which is dangerous to the preterm infant's brain.¹ VG can also be used for weaning the infant from the ventilator. As the baby's respiratory condition improves, the ventilator automatically reduces the PIP.



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- 4 Managing tidal volume delivery
- 5 Predictive Intelligent Control of Oxygenation (PRICO)**
- 6 Connectivity

Closed loop FiO_2 - SpO_2 is an important tool that protects babies from out of target oxygen ranges. PRICO is easy to apply in all modes.

[Click here](#) to learn more about PRICO



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fabian™ has a complete communication protocol to deliver ventilator data to hospital data management systems



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Standout ventilation modes

 Click categories below to view content

1 Non-Invasive Ventilation (NIV)

2 Volume guarantee (VG)

3 Conventional ventilation

HFNC, nCPAP, duoPAP, and CPAP are all available in this model.

In CPAP Ventilation the patient breathes spontaneously, the ventilator does NOT provide mandatory breaths. This mode provides a continuous distending positive pressure during inspiration and expiration in order to splint open the airways and lungs, noticeably reducing the patient's breathing effort. In the event of an interruption in the patient's breathing following the default Apnea Period, the ventilator performs a default number of mechanical breaths to stimulate spontaneous breathing. After breathing commences, stimulation stops and only commences with the next Apnea event.

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Standout ventilation modes

 Click categories below to view content

1 Non-invasive Ventilation (NIV)

2 Volume guarantee (VG)

3 Conventional ventilation

VG can be set between 0.8 to 300 mL, ideal for extremely low birth weight babies.

[Click here](#) to learn more about VG.

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Standout ventilation modes

 Click categories below to view content

1 Non-invasive Ventilation (NIV)

2 Volume guarantee (VG)

3 Conventional ventilation

IPPV – Intermittent Positive Pressure Ventilation: Positive pressure during Inspiration with passive expiration. This mode should only be used if no spontaneous breathing from patient is expected. IPPV can be applied also in Non-Invasive mode (Nasal IPPV or NIPPV). A higher I-flow can be requested during nIPPV mode, because of potential higher leakages.

SIMV – Synchronized Intermittent Mandatory Ventilation: The patient can spontaneously breathe in between breaths but receives no pressure support. Ideal for weaning from ventilation. If Apnea is detected, ventilation will commence with the specified TI and TE frequency. The synchronization window for the next mechanical breath is maximum $\frac{1}{2} T_e$.

SIMV + PSV – Synchronized Intermittent Mandatory Ventilation combined with PSV: The patient can initiate a PSV breath in between the mandatory SIMV breaths. The machine breaths (SIMV) are synchronized with the patient's breathing pattern. The number of mandatory breaths is the same as the preset rate. Every spontaneous Inspiratory effort of the patient is supported with the preset pressure support level. It ends when flow termination criteria are met.

SIPPV – Synchronized Intermittent Positive Pressure Ventilation: Each spontaneous patient inspiratory effort triggers a mechanical breath of the ventilator according to the ventilator parameters set for inspiratory period and pressure. The number of breaths per minute supported by the ventilator is controlled by the patient.

PSV – Pressure Support Ventilation: This option is used to support spontaneous breathing. The ventilator provides pressure during the spontaneous inspiration to offset part of the patient work of breathing. The breathing frequency is determined by the spontaneously breathing patient. However, the ventilator will now control expiration. If the patient stops breathing spontaneously the ventilator will assume alternate breathing with the parameter settings. Apnea Backup Ventilation will start after preset Apnea Time. PSV is only available with active flow sensor measurement.

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Technical specifications

Click categories below to view content

1 Special procedures

2 Dimension

3 Input and output ports

4 Setting ranges and parameters

Manual inspiration/hold
(Sustained Lung Inflation)

PRICO, option



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Technical specifications

 Click categories below to view content

1 Special procedures

2 Dimension

3 Input and output ports

4 Setting ranges and parameters

(W x H x D) 24 cm x 27 cm x 35 cm

Approx. 10 kg

Diagonal screen size 5.7"

TFT color touch-screen with LED backlight

Keypad with 10 buttons



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Technical specifications

Click categories below to view content

1 Special procedures

2 Dimension

3 Input and output ports

4 Setting ranges and parameters

1 USB port (for SW updates)

1 RS 232 (9 pin) port for PDMS/HIS

1 RJ 45 Ethernet port for PDMS/HIS

1 nurse call connector

External trigger connector



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Technical specifications

Click categories below to view content

1 Special procedures

2 Dimension

3 Input and output ports

4 Setting ranges and parameters

Parameter	Mode		IPPV		DUPAP		O2 Therapy			
			Neonatal		Pediatric		Neonatal		Pediatric	
	min	max	min	max	min	max	min	max	min	max
I-time [sec]					0.15	15				
E-time [sec]					0.2	30				
Frequency (Rate) [1/min]					2	60				
O ₂ [%]	21	100	21	100	21	100	21	100	21	100
O ₂ Flush [%]	23	100	23	100	23	100	23	100	23	100
Flush Time [sec]	0	120	0	120	0	120	0	120	0	120
Man, Breath Time [sec]	2	30	2	30						
Flowmin [l/min]							1	85	1	85
CPAP [mbar]	2	13	2	13						
Pmanual [mbar]	5	15								
PDUO [mbar]			5	15						

Parameter	Mode		PSV		CPAP					
			Neonatal		Pediatric		Neonatal		Pediatric	
	min	max	min	max	min	max	min	max	min	max
I-flow [LPM]	1	32	1	32						
E-flow [LPM]	1	32	1	32						
Rise Time [sec]	0.1	2	0.3	2						
I-time [sec]	0.1	2	0.3	2						
E-time [sec]	0.2	30	0.2	30						
Frequency (Rate) [1/min]	2	200	2	100						
Backup Rate [mbar]	0	30	0	30						
P _{backup} [mbar]	4	80	4	80						
PPSV [mbar]	2	80	2	80						
Trigger	1	10	1	10						
V _{limit} [mL]	1	150	10	500						
V _{guarant} [mL]	0.8	60	10	300						
O ₂ [%]	21	100	21	100	21	100	21	100	21	100
O ₂ Flush [%]	23	100	23	100	23	100	23	100	23	100
Flush Time [sec]	0	120	0	120	0	120	0	120	0	120
Man, Breath Time [sec]	2	30	2	30	2	30	2	30	2	30
Termination criteria PSV [%]	1	85	1	85						
Flowmin [Lpm]					4	16	4	16		
CPAP [mbar]					1	30	1	30		
P _{manual} [mbar]					4	100	4	100		
Backup					0	5	0	5		

Parameter	Mode		SIMV				SIMV + PSV			
			Neonatal		Pediatric		Neonatal		Pediatric	
	min	max	min	max	min	max	min	max	min	max
I-flow [LPM]	1	32	1	32	1	32	1	32	1	32
E-flow [LPM]	1	32	1	32	1	32	1	32	1	32
Rise Time [sec]	0.1	2	0.3	2	0.1	2	0.3	2	0.1	2
I-time [sec]	0.1	2	0.3	2	0.1	2	0.3	2	0.1	2
E-time [sec]	0.5	30	0.5	30	0.5	30	0.5	30	0.5	30
Frequency (Rate) [1/min]	2	200	2	100	2	200	2	100	2	100
Backup Rate [mbar]	0	30	0	30	0	30	0	30	0	30
P _{backup} [mbar]	4	80	4	80	4	80	4	80	4	80
PPSV [mbar]					2	80	2	80		
Trigger	1	10	1	10	1	10	1	10	1	10
V _{limit} [mL]	1	150	10	500	1	150	10	500	1	150
V _{guarant} [mL]	0.8	60	10	300	0.8	60	10	300	0.8	60
P _{max} [mbar]	4	80	4	80	4	80	4	80	4	80
O ₂ [%]	21	100	21	100	21	100	21	100	21	100
O ₂ Flush [%]	23	100	23	100	23	100	23	100	23	100
Flush Time [sec]	0	120	0	120	0	120	0	120	0	120
Man, Breath Time [sec]	2	30	2	30	2	30	2	30	2	30
Termination criteria PSV [%]					1	85	1	85		

Parameter	Mode		IPPV		SIPPV					
			Neonatal		Pediatric		Neonatal		Pediatric	
	min	max	min	max	min	max	min	max	min	max
I-flow [LPM]	1	32	1	32	1	32	1	32	1	32
E-flow [LPM]	1	32	1	32	1	32	1	32	1	32
Rise Time [sec]	0.1	2	0.3	2	0.1	2	0.3	2	0.1	2
I-time [sec]	0.1	2	0.3	2	0.1	2	0.3	2	0.1	2
E-time [sec]	0.2	30	0.2	30	0.2	30	0.2	30	0.2	30
Frequency (Rate) [1/min]	2	200	2	100	2	200	2	100	2	100
PEEP [mbar]	0	30	0	30	0	30	0	30	0	30
P _{insp} [mbar]	4	80	4	80	4	80	4	80	4	80
Trigger					1	10	1	10		
V _{limit} [mL]	1	150	10	500	1	150	10	500	1	150
V _{guarant} [mL]	0.8	60	10	300	0.8	60	10	300	0.8	60
P _{max} [mbar]	4	80	4	80	4	80	4	80	4	80
O ₂ [%]	21	100	21	100	21	100	21	100	21	100
O ₂ Flush [%]	23	100	23	100	23	100	23	100	23	100
Flush Time [sec]	0	120	0	120	0	120	0	120	0	120
Man, Breath Time [sec]	2	30	2	30	2	30	2	30	2	30

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fabian™ HFO




The fabian™ HFO with a 10.4" touch screen is our most comprehensive ventilator. This model has true single membrane high frequency oscillation with active inspiration and expiration.

- » Feature highlights
- » High frequency oscillator (HFO)
- » Technical specification summary



fabian™ HFO

Feature highlights

 Click categories below to view content

1 High frequency oscillator (HFO)

2 Volume, flow and pressure trigger

3 Lung recruitment

4 Predictive Intelligent Control of Oxygenation (PRICO)

5 Forced Oscillation Technique (FOT)

6 Volume guarantee (VG)

7 etCO₂ microstream and mainstream

The fresh gas port allows for use of Nitric Oxide (NO). Also, additional enhancements like lung recruitment are available during HFO treatment.

[Click here](#) to learn more about high frequency oscillation.



[fabian™ HFO](#)



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Designed with a Hotwire Anemometer flow sensor

Offers volume trigger which can be valuable for indirect evaluation of patient's drive

The sensitivity of the flow trigger of 0.12 – 1.2 LPM is ideal for extremely low birthweight babies

The trigger sensitivity can be adjusted from level 1 – 10



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Lung recruitment is an optional setting in HFO

HFO in lung recruitment -Adjustable 5 to 20 Hz

Inspiratory Time Lung Recruitment -Adjustable 2 to 13 seconds

The Pmean is thereby increased cyclically to an adjustable value "Pmean rec"

The repetition frequency is selectable from one cycle / hour to four cycles / minute

The Inspiratory Time can be set from 2 to 60 seconds if the Expiratory Time is ≥ 2 seconds

Manual breath HFO Predictive



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Closed loop FiO₂-SpO₂ is an important tool that protects babies from out of target oxygen ranges. PRICO is easy to apply in all modes.

[Click here](#) to learn more about PRICO



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Feature highlights

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FOT measures the reactance (XRs). XRs is a powerful tool for optimal PEEP/CPAP and MAP setting and an effective measurement for safe Lung Recruitment.

[Click here](#) to learn more about FOT



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VG can be set between 0.8 to 300 mL, ideal for extremely low birth weight babies.

[Click here](#) to learn more about VG.



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7 ETCO₂ microstream and mainstream

The fabian™ HFO supports three different etCO₂ module types to provide etCO₂ monitoring:

1. Microstream, MicroPod™ External etCO₂ Module from Oridion® (Covidien/Medtronic).
2. Capnostat® 5 Mainstream etCO₂ Sensor from Resironics® (Philips).
3. LoFlo Sidestream etCO₂ Sensor from Resironics (Philips).



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Technical specifications

Click categories below to view content

1 Setting ranges and parameters

2 Dimension

3 Input and output ports

Parameter	Mode		HFO			
			Neonatal		Pediatric	
	min	max	min	max	min	max
V _{guarant} [mL]	0.33	01	01	00		
AMP _{max} [mbar]5		1005		100		
O ₂ [%]	21	1002	11	00		
O ₂ Flush [%]	23	1002	31	00		
P _{manual} [mbar]	48	04		80		
H _{famp} [mbar]	5	1005		100		
H _{Freq} [Hz]	5	20	5	20		
P _{mean} 5		505		50		
I:E	1:3	1:1	1:3	1:1		
Flow [Lpm] (constant / bias)	5	20	5	30		
Freq _{rec} [1/h]1		2401		240		
P _{mean rec} [mbar]7		507		50		
I-time _{rec} [sec]	26	02		60		

Parameter	Mode		SIMV				SIMV + PSV			
			Neonatal		Pediatric		Neonatal		Pediatric	
	min	max	min	max	min	max	min	max	min	max
I-flow [LPM]	1	32	1	32	1	32	1	32	1	32
E-flow [LPM]	1	32	1	32	1	32	1	32	1	32
Rise Time [sec]	0.1	2	0.3	2	0.1	2	0.3	2	0.1	2
I-time [sec]	0.1	2	0.3	2	0.1	2	0.3	2	0.1	2
E-time [sec]	0.5	30	0.5	30	0.5	30	0.5	30	0.5	30
Frequency (Rate) [1/min]	2	200	2	100	2	200	2	100	2	100
Backup Rate [mbar]	0	30	0	30	0	30	0	30	0	30
P _{backup} [mbar]	4	80	4	80	4	80	4	80	4	80
PPSV [mbar]					2	80	2	80		
Trigger	1	10	1	10	1	10	1	10	1	10
V _{limit} [mL]	1	150	10	500	1	150	10	500	1	150
V _{guarant} [mL]	0.8	60	10	300	0.8	60	10	300	0.8	60
P _{max} [mbar]	4	80	4	80	4	80	4	80	4	80
O ₂ [%]	21	100	21	100	21	100	21	100	21	100
O ₂ Flush [%]	23	100	23	100	23	100	23	100	23	100
Flush Time [sec]	0	120	0	120	0	120	0	120	0	120
Man, Breath Time [sec]	2	30	2	30	2	30	2	30	2	30
Termination criteria PSV [%]					1	85	1	85		


Parameter	Mode		IPPV		DUPAP		O ₂ Therapy			
			min	max	min	max	min	max	min	max
	I-time [sec]					0.15	15			
E-time [sec]					0.2	30				
Frequency [1/min]					2	60				
O ₂ [%]	21	100	21	100	21	100	21	100	21	100
O ₂ Flush [%]	23	100	23	100	23	100	23	100	23	100
Flush Time [sec]	0	120	0	120	0	120	0	120	0	120
Man, Breath Time [sec]	2	30	2	30						
Flowmin [l/min]					1	85	1	85		
CPAP [mbar]	2	13	2	13						
P _{manual} [mbar]	5	15								
PDUO [mbar]			5	15						

Parameter	Mode		PSV				CPAP			
			Neonatal		Pediatric		Neonatal		Pediatric	
	min	max	min	max	min	max	min	max	min	max
I-flow [LPM]	1	32	1	32						
E-flow [LPM]	1	32	1	32						
Rise Time [sec]	0.1	2	0.3	2						
I-time [sec]	0.1	2	0.3	2						
E-time [sec]	0.2	30	0.2	30						
Frequency (Rate) [1/min]	2	200	2	100						
Backup Rate [mbar]	0	30	0	30						
P _{backup} [mbar]	4	80	4	80						
PPSV [mbar]	2	80	2	80						
Trigger	1	10	1	10						
V _{limit} [mL]	1	150	10	500						
V _{guarant} [mL]	0.8	60	10	300						
O ₂ [%]	21	100	21	100	21	100	21	100	21	100
O ₂ Flush [%]	23	100	23	100	23	100	23	100	23	100
Flush Time [sec]	0	120	0	120	0	120	0	120	0	120
Man, Breath Time [sec]	2	30	2	30	2	30	2	30	2	30
Termination criteria PSV [%]	1	85	1	85						
Flowmin [Lpm]					4	16	4	16		
CPAP [mbar]					1	30	1	30		
P _{manual} [mbar]					4	100	4	100		
Backup					0	5	0	5		

Parameter	Mode		IPPV				SIPPV			
			Neonatal		Pediatric		Neonatal		Pediatric	
	min	max	min	max	min	max	min	max	min	max
I-flow [LPM]	1	32	1	32	1	32	1	32	1	32
E-flow [LPM]	1	32	1	32	1	32	1	32	1	32
Rise Time [sec]	0.1	2	0.3	2	0.1	2	0.3	2	0.1	2
I-time [sec]	0.1	2	0.3	2	0.1	2	0.3	2	0.1	2
E-time [sec]	0.2	30	0.2	30	0.2	30	0.2	30	0.2	30
Frequency (Rate) [1/min]	2	200	2	100	2	200	2	100	2	100
PEEP [mbar]	0	30	0	30	0	30	0	30	0	30
P _{insp} [mbar]	4	80	4	80	4	80	4	80	4	80
Trigger					1	10	1	10		
V _{limit} [mL]	1	150	10	500	1	150	10	500	1	150
V _{guarant} [mL]	0.8	60	10	300	0.8	60	10	300	0.8	60
P _{max} [mbar]	4	80	4	80	4	80	4	80	4	80
O ₂ [%]	21	100	21	100	21	100	21	100	21	100
O ₂ Flush [%]	23	100	23	100	23	100	23	100	23	100
Flush Time [sec]	0	120	0	120	0	120	0	120	0	120
Man, Breath Time [sec]	2	30	2	30	2	30	2	30	2	30

fabian™ HFO

Technical specifications

 Click categories below to view content

1 Setting ranges and parameters

2 Dimension

3 Input and output ports

(W x H x D) 30 cm x 37 cm x 40 cm

Weight approx. 20 kg with HFO module

Diagonal screen size 10.4"

TFT color touch-screen with LED backlight

Keypad with 10 buttons



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Technical specifications

 Click categories below to view content

1 Setting ranges and parameters

2 Dimension

3 Input and output ports

1 USB port (for SW updates/Log files)

1 RS 232 (9 pin) port for PDMS/HIS

1 RJ 45 Ethernet port for PDMS/HIS

1 CO₂ sensor connection

1 SpO₂ sensor connection

1 Video out connector (HDMI)

1 nurse call connector



fabian™ HFO



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HFO

FOT

PRICO

Volume
Guarantee



High Frequency Oscillation

fabian™ offers high frequency oscillation in addition to all standard NIV and conventional modes

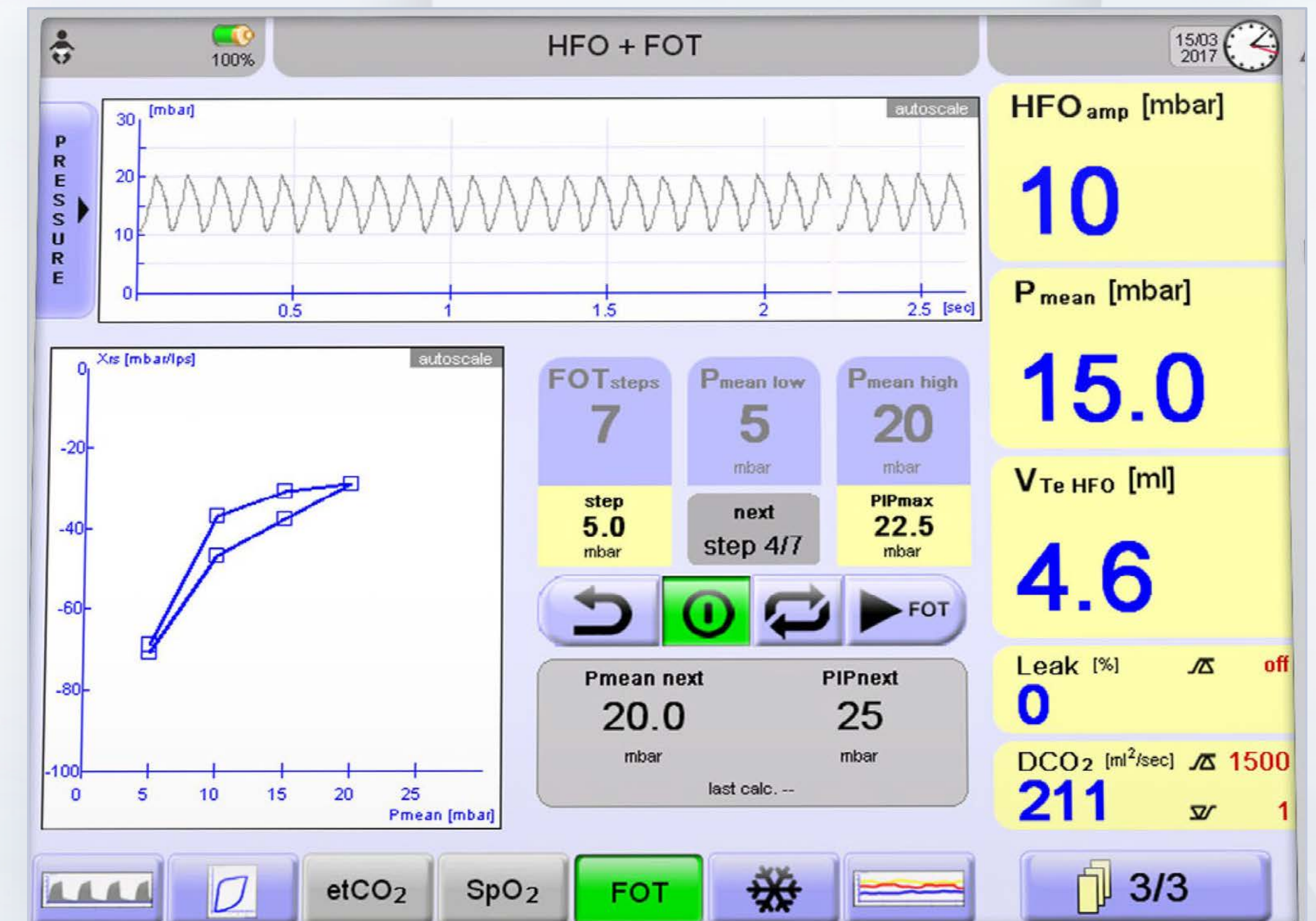
High frequency oscillation (HFO) in the fabian™ is designed with a single membrane and piston technology. The design enables high performance with active inspiration and expiration. This is the same working principle behind the 3100A oscillator.

HFO is fully integrated into the inspiratory section. The fresh gas port allows for easier use of Nitric Oxide (NO) systems and functions as the nCPAP port, making it even easier to switch modalities.

The bias flow and expiratory valve mechanism minimizes mean airway pressure (MAP) instability in instances of high leaks.

Other optional settings during HFO therapy include:

- Volume limit
- Volume guarantee
- FOT
- PRICO
- Manual inspiration
- Nasal-HFO
- Nebulizing treatment
- O₂ flush
- ETCO₂



Forced Oscillation Technique

Intelligent lung optimization from the very start



Available on the fabian™ HFO

The patented Forced Oscillation Technique (FOT) is a non-invasive, protective and easy method that allows the clinician to optimize lung volume. During a recruitment maneuver FOT determines the optimal reactance Xrs by sending a small and well defined pressure oscillation into the airway opening, and subsequently measures the flow response of the respiratory system. The reactance Xrs is a very precise measure of how the lung reacts to the pressure pulse. By setting the optimal CPAP, PEEP and MAP level for the individual patient, FOT greatly reduces mechanical stress to the lungs.

The following sensors and ventilation additives can be used together with FOT:

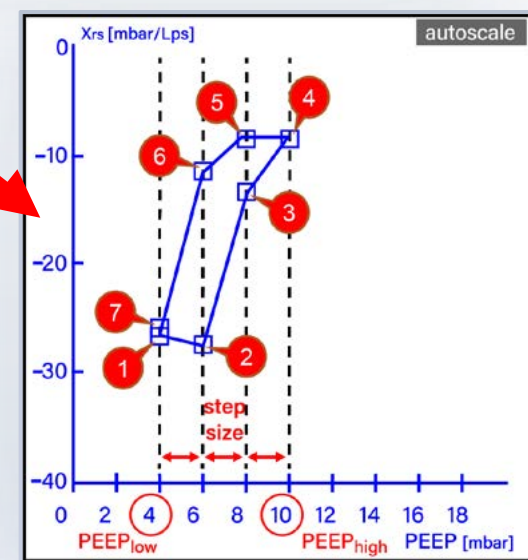
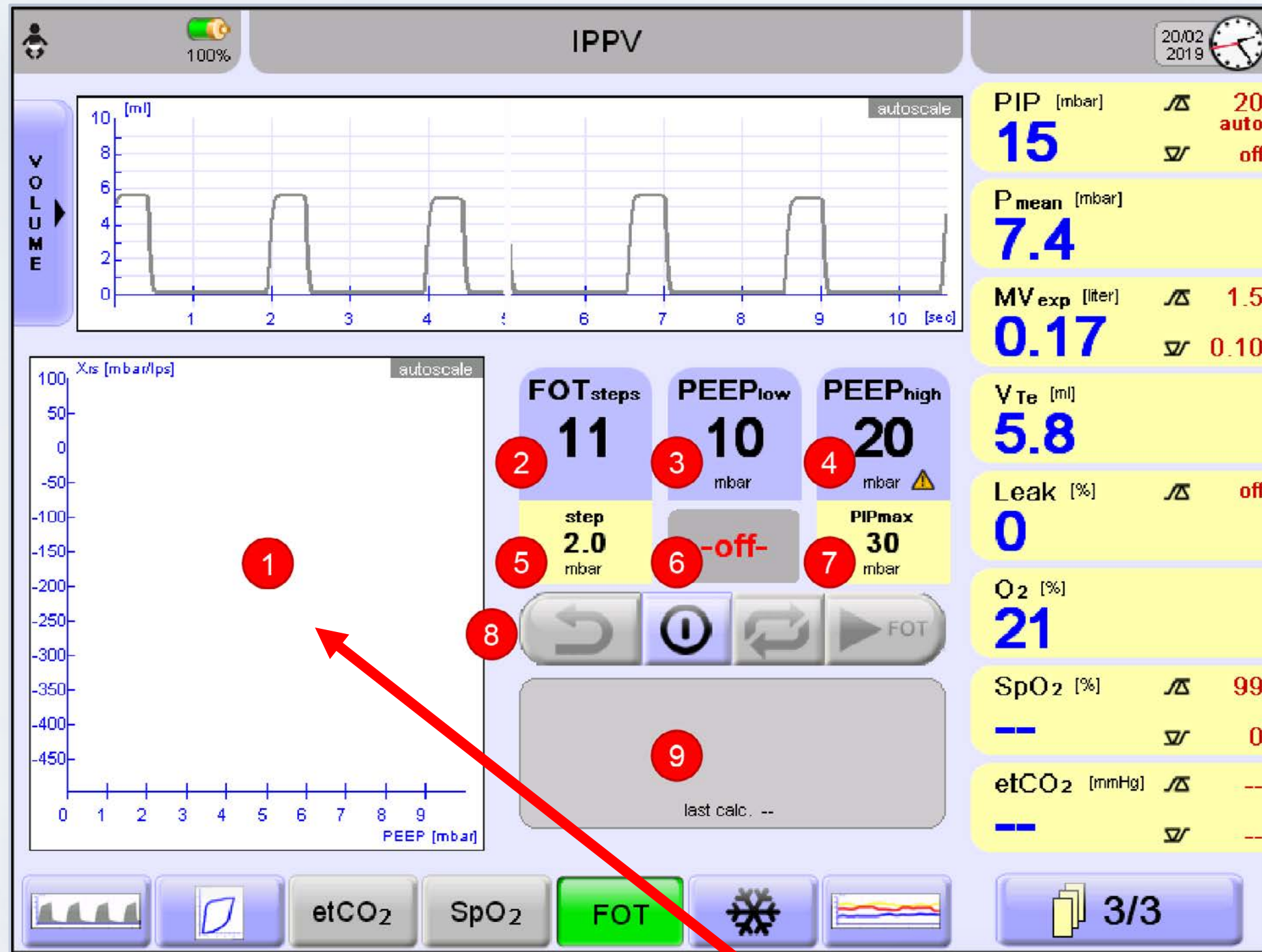
- Volume Guarantee (VG)
- Volume Limit (VL)
- SpO₂ sensor
- Predictive Intelligent Control of Oxygenation (PRICO)

FOT is available as a submenu under Waves / loops in fabian™ HFO ventilators in the following modes:

Ventilation Mode	FOT Type
HFO	FOT-HFO
CPAP	FOT-Conventional
IPPV	
PSV	
SIMV	
SIMV+PSV	
SIPP	

[Click here](#) for FOT display.

FOT on display



1. **FOT graph:** Displays and connects the calculated Xrs values (always auto scaled).
2. **FOT_{steps}** setting: Used to set the number of reactance measurements between the pressure range defined by low and high-pressure settings.
3. **P_{mean low} / PEEP_{low}** setting: Used to set the lower (starting and ending) point of recruitment / derecruitment procedure.
4. **P_{mean high} / PEEP_{high}** setting: Used to set the upper (turnaround) point of recruitment / derecruitment maneuver procedure.
5. **Step** size information field: The pressure difference between two consecutive FOT measurements. It is automatically calculated out of the difference between the low and high-pressure settings and FOT.
6. **Information field:** Depending on the status of FOT it displays if it is OFF; the remaining time of the stabilization period; the remaining time of forced oscillation; the number of next step.
7. **PIPmax** information field: The maximally reached peak pressure during the whole recruitment procedure. It is automatically calculated out of the high pressure setting and the ventilation's actual ΔP .
8. **Control buttons:** Reverse; ON / OFF; Repeat; Next step/Start measurement.
9. **Information field:** Depending on the status of FOT it displays the current and next PEEP/ Pmean and PIP values; the date and time of last recruitment / derecruitment maneuver; feedback

IPPV settings		FOT settings			
PEEP	P _{insp}	PEEP _{low}	PEEP _{high}	FOT _{steps}	Step
6 mbar	14 mbar	4 mbar	10 mbar	7	2 mbar

Predictive Intelligent Control of Oxygenation

Predictive Intelligent Control of Oxygenation (PRICO) is the next generation of Intelligent Closed-Loop FiO_2 - SpO_2 control, maintaining the patient's SpO_2 within the desired range. Together with the Masimo Set[®] SpO_2 -Sensors, its unique algorithm FiO_2 adjustments are performed automatically, quickly, and more reliably than ever before.

PRICO not only supports caregivers in their daily goal for best possible patient comfort and safety, but also helps clinicians save time, reduce cost, and improve their workflow.

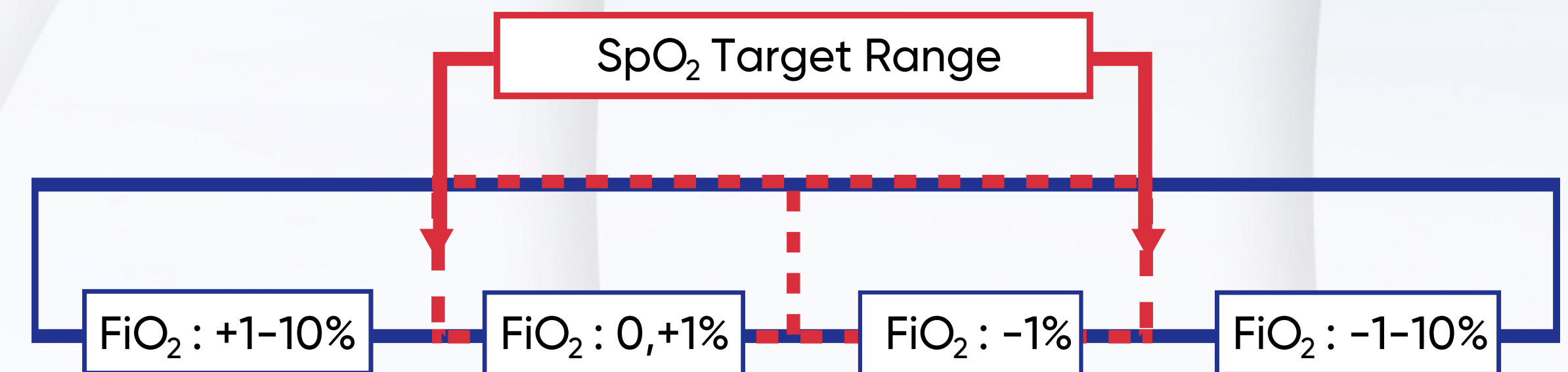


Diagram of the *PRICO* Algorithm

The *PRICO* algorithm works as outlined in the diagram above. After every 30 seconds, an FiO_2 adjustment is made based on the current SpO_2 and its position in one of the four regions.

- Outside the SpO_2 target range: the FiO_2 step size (1 to 10%) is determined by current SpO_2 trend of SpO_2 data and an extrapolation of SpO_2 data.
- Inside the SpO_2 target range: FiO_2 step of +1%, if FiO_2 is in lower half. If FiO_2 is in upper half decrease FiO_2 by 1%.
- FiO_2 adjustments are made up to the pre-set FiO_2 limits (Min FiO_2 to Max FiO_2).

»» How PRICO works

»» PRICO parameters

»» PRICO modes

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»» PRICO modes

PRICO Parameters

1	Min FiO_2	Range: 21 to 99%
2	Max FiO_2	Range: 22 to 100%
3	SpO_2 low target	Range: 0 to 99%
4	SpO_2 high target	Range: 1 to 100%
5	PRICO ON / OFF	ON / OFF switch for PRICO (touch screen softkey in fabian HFO, hard key in fabian =nCPAP evolution and fabian Therapy evolution)



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Volume Guarantee



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»» How PRICO works

»» PRICO parameters

»» PRICO modes

- Continuous Positive Airway Pressure (CPAP)
- High and Low Flow Oxygen Therapy HFNC (O_2 Therapy)
- Intermittent Positive Pressure Ventilation (IPPV)
- NIV Bi-levels positive airway pressure (duoPAP)
- NIV Continuous Positive Airway Pressure (NCPAP)
- Pressure Support Ventilation (PSV)
- Synchronized Intermittent Mandatory Ventilation (SIMV)
- Synchronized Intermittent Mandatory Ventilation with PSV support (SIMV+PSV)
- Synchronized Intermittent Positive Pressure Ventilation (SIPPV)



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Volume
Guarantee



Precision for delicate lungs with volume guarantee



The challenge Ventilate gently by controlling VTe

Not all volume control modes are the same. Pressure limited ventilation delivers a fixed Peak Inflating Pressure (PIP). PIP is used to push a tidal volume into the lungs. However the tidal volume may fluctuate widely due to the baby's breathing effort, changes in lung mechanics and variable endotracheal tube leak.¹



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HFO

HFO

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PRICO

**Volume
Guarantee**



Precision for delicate lungs with volume guarantee



The challenge Ventilate gently by controlling VTe

For some patients, a strategy of targeting a required exhaled tidal volume while maintaining pressure within a prescribed range can improve gas exchange without the risk of lung injury associated with volume control ventilation in preterm infants.¹ The fabian™ series of ventilators allow volume-targeted ventilation for lungs as delicate as those of extremely low birthweight neonates. The operator sets a Target Expired VTe. The ventilator measures the Expired VTe for each inflation and automatically adjusts the PIP (Ppeak) aiming to deliver the VTe around the Set Level. Measurements are done with the proximal flow sensor placed at the wye-piece. The Flow Sensor measures Inspired and Expired tidal volume, and ETT Leak is calculated and displayed. The maximum difference in pressure from breath to breath is limited to one-third of the previous breath to avoid any overdistension due to excessive pressure compensation.



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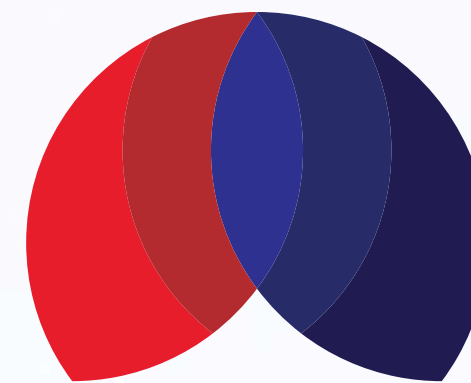
HFO

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REFERENCE: 1. 1. COLIN J. MORLEY, VOLUME-LIMITED AND VOLUME-TARGETED VENTILATION, CLINICS IN PERINATOLOGY, 39 (2012), 513-523 [HTTP://DX.DOI.ORG/10.1016/J.CLIP.2012.06.016](http://dx.doi.org/10.1016/j.clp.2012.06.016)

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