



# SOPHIE



THE INNOVATIVE  
NEONATAL  
VENTILATION SYSTEM

# SO PRECISE. SO PERFECT. SOPHIE.

Sophie was developed to meet the demand of neo-natologists for a sensitive ventilator. SOPHIE offers state-of-the-art ventilation technology with the option of using customized ventilation strategies for pre-mature and newborn babies. Its high-tech trigger technology provides you with flexible synchronization for both invasive and non-invasive ventilation.

The major challenge in non-invasive ventilation (NIV) of newborn and premature infants is the adjustment of ventilation and oxygen saturation to the current, frequently changing patient situation.

This is one of SOPHIE's strengths; thanks to innovative sensor technology, the device immediately recognizes changes and adjusts therapy parameters accordingly. In addition, you have the option of activating high-frequency oscillation at the touch of a single button if the situation so requires. Plus: SOPHIE allows effective monitoring at every stage during therapy to ensure optimal supervision.

## REDUCING THE RISK OF BRAIN DAMAGE AND BLINDNESS.

SOPHIE uses SPO<sub>2</sub>C, an integrated oxygen saturation controller, which automatically maintains optimum oxygen saturation. By adjusting saturation in real time, SOPHIE helps reducing the risk of brain damage and blindness.

Monitoring the course of therapy is also simplified considerably, as all relevant parameters are continuously recorded and can be accessed in trend view at any time.



## SO INNOVATIVE. SO INTELLIGENT. SOPHIE.

SOPHIE not only automatically adapts the therapy to the patient's needs but also documents the entire course of therapy. This relieves the strain from care staff and creates space for the important aspects of care which cannot be automated. The advantages in everyday hospital life are obvious:

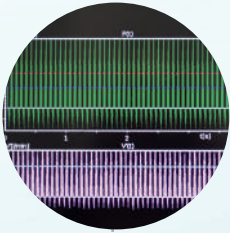
- + No manual recording of oxygen saturation
- + Reduction of manual therapy adjustments
- + Optimal ventilation of the little patients at all times

If required, simply activate high-frequency oscillation at the push of a button. Thanks to the integrated solution, there is no need for changing patient tubes.

Because little patients change their breathing pattern with every movement, SOPHIE is particularly flexible. The respiratory sensor converts abdominal movements into a trigger signal and ventilation is adapted automatically. The child's breathing and NIV ventilation are synchronized in real time. As a result, your benefit from significantly reduced re-intubation rates. Another major advantage of SOPHIE is its electronic flow sensor. It allows accurate measurement of flow rates to record tidal volume (V<sub>t</sub>) and flow with minimal dead space. The sensor is heated to prevent condensation. Respiratory gas is optimally humidified thanks to the integrated humidification system, which heats and humidifies respiratory gas for the little patients.



# THESE FEATURES MAKE SOPHIE UNIQUE.



+ Integrated high-frequency oscillation



+ External respiration sensor for synchronized non-invasive ventilation and apnea detection



+ Automatic integrated respiratory humidification



+ Clearly arranged, user friendly touch panel



+ Heated electronic flow sensor



+ SpO<sub>2</sub> controller SPO<sub>2</sub>C for optimum oxygen saturation



# SOPHIE



## + HFO & VG

Sophie 2020 provides maximum patient safety and exceptionally intuitive operation thanks to high-frequency oscillation with optional volume guarantee (HFO-Vosz).

## + HFO frequency

For optimal coverage of all clinical applications, we have expanded our adjustable high-frequency oscillation range from 15 Hz to up to 20 Hz.

## + High Flow function

Integrated high-flow functionality allows for highly accurate adjustment within a range of 1 to 25 l/min and is specifically designed to address the needs of premature and newborn infants.



## + HL7 compatibility

Integration with the HL7 protocol ensures easy and seamless connectivity between Sophie and your hospital information system.

## + PDFS

For maximum ventilation efficiency, Sophie 2020 now supports dead-space-free ventilation. Simply connect the PDFS flow sensor to the existing flow sensor port.

## + NIVA

By integrating NIVA (Noninvasive Ventilatory Assist), we are expanding the range of noninvasive ventilation options available with Sophie 2020 to include proportional respiratory support. In addition to individual manual adjustment of the boost factor, automatic, on-demand adjustment allows for comfortable and precise adaptation to patients' needs.

# TECHNICAL DATA

## General

Patient range	Neonates and pediatric patients up to 25 kg
Classification	II b (according to 93/42 ECC)
Dimensions	470 x 342 x 332 mm (WxHxD)
Weight	26 / 42 kg (without/with trolley)
Function principle	time cycled, pressure controlled

## Operational specifications

Power supply	100-240 V AC, 50-60 Hz, 210 VA
Battery backup	min. 80 min. (with internal, rechargeable Li-Ion-Battery)
Gas supply	
AIR	2.7 - 6.5 bar
O <sub>2</sub>	2.7 - 6.5 bar

## Ventilation parameters

Ventilation modes	
Invasive	CPAP, PC-IMV, PC-Ass./Cont., PC-SIMV, PC-HFO (opt.), PC-IMV-HFO (opt.), PC-Ass./Con.-ITT, PC-SIMV-ITT
Non-invasive	nCPAP, NIPPV, SNIPPV (opt.), PC-HFO, PC-sHFO, High Flow O <sub>2</sub> Therapy
Modifications	Volume guarantee (VtLim/VtTar) Inspiratory Time Termination (ITT) PSV Volume guarantee in HFOV (HFO-Vosz)
Maneuver functions	Inspiration Hold / Manual, Pre-oxygenation, Medication nebulization

## Flow sensor

Single use or reusable, electrical, heated

## Ventilation settings

Frequency	1 - 300/min
Inspiration time	0.1 - 2 s
Expiration time	0.1 - 60 s
Tidal volume	2 - 150 ml (VtTar/VtLim)
Pmax	5 - 60 mbar
PEEP	0 - 30 mbar
Inspiration pattern	Rectangle, sinusoidal, linear
Trigger sensitivity	
Flow	0.2 - 2.9 l/min
Pressure	0.2 - 2.9 mbar
Abdominal movement	0.2 - 2.9 Arbs
NIV MaxFlow	Off/20 - 6 l/min
High Flow O <sub>2</sub> Therapy	1-25lpm
Breathing gas temp.	30 - 40° C
FiO <sub>2</sub>	21 - 100%
Inspiratory Time Termination (ITT) PSV	
Exp.-Trigger KV%	5 - 40% V' Peak
High frequency oscillation HFO	
Frequency	5 - 20 Hz
Inspiration	33 - 50%
MAP	0 - 30 mbar
Amplitude Posc	5 - 100%
Amplitude Vosc	max. 24 ml @ 10 Hz
Base FiO <sub>2</sub>	21 - 100%
Backup FiO <sub>2</sub>	Base, 21 - 100%
SpO <sub>2</sub> UL	84 - 100%
SpO <sub>2</sub> LL	80 - 96%
Inspiration	Hold / Manual
Max. hold time	T <sub>insp</sub> 1 - 7 s
Medication nebulization	
Aerosol time	30 - 420 s
Pre-Oxygenation	
FiO <sub>2</sub>	0 - 100%
Preoxy time	0 - 420 s

## Parameters

Insp. pressure	-20 - 99 mbar (Pmax)
End Expiration pressure	-20 - 99 mbar (PEEP)
Mean airway pressure	-20 - 99 mbar (Pmean)
Osc. amplitude	0 - 120 mbar (Posc)
Volume measurement	
Insp. tidal volume	0 - 999 ml (VTins)
Exp. tidal volume	0 - 999 ml (VTexp)
Leak volume	0 - 999 ml (VTleak)
Exp. minute volume	0 - 999 l/min (MV)
Osc. minute volume	0 - 999 l/min (MVo)
Ventilation time parameters	
Breathing frequency (F)	0 - 999 /min
Inspiration	0 - 100% (Insp%)
O <sub>2</sub> measurement	
FiO <sub>2</sub>	0 - 100%
Breathing gas temperature	
Proximal measurement	12 - 60° C
Lung mechanics	
Resistance (R)	0 - 999 mbar/l/s
Compliance (C)	0 - 999 ml/mbar
SpO <sub>2</sub>	0 - 100%
BaseFiO <sub>2</sub>	0 - 100%
Curve display	Paw(t), V'(t), V(t), V(P), V'(V), V'(P), Arbs(t)
Trend display	Pmean(t), MV(t), VT(t), FiO <sub>2</sub> (t), BaseFiO <sub>2</sub> (t), SpO <sub>2</sub> (t)
Trend duration	0,5; 1; 2; 4; 12; 24 (h)

## Alarms / Monitoring

Airway pressure	high/low (Pmax)
Exp. minute volume	high/low (MV)
Exp. tidal volume	high/low (VT)
Insp. O <sub>2</sub> Conc. FiO <sub>2</sub>	high/low
Breathing gas temp.	high/low
End Exp. pressure	high (PEEP)
Mean airway pressure	high/low (Pmean)
Osc. amplitude	high/low (Posc)
Osc. tidal volume	high/low (Vosc)
Osc. minute volume	high/low (MVo)
Base FiO <sub>2</sub>	high
FiO <sub>2</sub> Limit	
Disconnection	
Water level humidifier bottle	
Apnea	

## Features

Abdominal trigger (external)	
SPO <sub>2</sub> C (SpO <sub>2</sub> -Controller)	
Refill-System (automatically) for integrated humidification	
Automatic Leak Compensation	

## Interfaces / Monitore

RS232 (Vue Link, PDMS, IntelliBridge), USB, Ethernet, HL7 Compatibility	
GE Healthcare	Patient monitor DASH, SOLAR, CARESCAPE Unity Network Interface Device in connection with pulse oximeter option
Masimo	Radical 7 Signal Extraction pulse CO oximeter
Philips	IntelliVue X2, MP series, MX series
Dräger	Infinity series

## Operating unit

Screen	12.1" Colour Touchscreen
Color scheme	Day view / night view
Input devices	Buttons + Turn-Push-Button, Touchscreen



Fritz Stephan GmbH Medizintechnik  
Kirchstraße 19  
56412 Gackebach  
Germany



**Tel** +49 6439 9125 0  
**Fax** +49 6439 9125 111  
**E-Mail** [info@stephan-gmbh.com](mailto:info@stephan-gmbh.com)  
**Web** [www.stephan-gmbh.com](http://www.stephan-gmbh.com)