Supplementary Table 1: Main characteristics of tested ventilators

Tested ventilator	Software version	Control principle	Neonatal and or pediatric modes	Flow sensor	Triggering and cycling parameters	Leak compensation	Leaks unit
SLE®5000 (SLE Ltd, South Croydon, UK) http://www.sle.co.uk	4.3	Continuous flow (8L/min)	0.350-20Kg Delivering volumes from 2 to 200ml	Proximal dual-hotwire 10 mm anemometer flow sensor	Inspiratory flow trigger: 0,2 à 2 L/min Cycling: 0-50%; default value 5%	Leak compensation included in the latest versions 4000 and 5000 In the presence of a leak the ventilator automatically increases the termination sensitivity to just above the measured leak and thereby allows inspiration to be cycled off. The leak compensation is effective from 10% - 50%.	%
Leoni®Plus (Heinen & Loöwenstein, Bad Ems, Germany) www.hul.de	2.2.12	Continuous flow, flow-cycled, pressure-limited	From premature infants to 30 Kg Delivering volumes from 2 to 200ml	Proximal flow sensor; 10 mm dual-hotwire Anemometer	Inspiratory flow trigger: (0,1 à 1 lpm) Cycling: fixed value 25% of peak inspiratory flow	Leak compensation : automatic adjustment of difference between VTI and VTE	%
Fabian® (Acutronic Medical Systems AG, Hirzel – Switzerland) www.acutronic-medical.ch	1.0.0.30	Continuous flow, flow-cycled, pressure-limited	Neonatal and pediatric modes Identical, except for the inspiratory flow limitation : neonatal = 1 - 20 L/min and paediatric 1 - 32 L/min	Proximal hot wire flow sensor	Inspiratory Trigger: (Scales 1 to 20) - Volume trigger with sensitivity of 5 to 20 % of inspiratory volume - Flow trigger with 5 to 20% of Cycling: 10-70% Peak inspiratory flow	Flow always available and the exhalation valve just maintains a constant pressure To compensate the trigger level, the continuous flow through ET tube is taken as offset for the trigger level.	%
Babylog®VN500 Plus or VN®500 (Dräger, Lübeck, Germany) www.draeger.com	1.21	Demand flow system with a base flow of: - 6l/min in neo.mode - 3l/min in ped.mode	Neonatal mode: 400g - 10kg Pediatric mode: 5kg - 20kg	Proximal flow sensor hot wire anemometer	Inspiratory flow trigger: 0.2 to 5 L/min Cycling: fixed value 15% of peak flow.	Calculation of a leak index: measurements of the leak flow by subtracting expiratory to inspiratory flow and determination of the leak index as a function of airway pressure. Compensation by an increased inspiratory flow. Only the patient flow is used for the flow trigger or the inspiratory termination criterion. The adaptation to the level of leaks takes few breaths.	% and L/Min
Evita option NeoFlow (Dräger Inc., Lübeck, Germany) www.draeger.com	7.0	Pediatric: Demand flow system Neonatal: Demand flow system with base flow of 6l/min (can be adjusted by biomed up to 9l/min)	Neomode: 0.5-6Kg Pediamode : 3-15Kg	Proximal flow sensor hot wire anemometer	Flow trigger 0.3 to 5l/min Cycling: 5-70% of the Peak inspiratory flow for pediatric mode; 15% in neomode.	Evita XL takes into account both the flow signal from the neonatal flow sensor (Flowinsp) and the calculated leakage minute volume (MVleak). The leakage flow is converted to the momentary pressure level (PAW): FlowPatient, insp = Flowinsp – MVleak x PAW / Pmean. The automatic compensation of leaks allows for direct adjustment of tidal volume down to 3 mL.	% L/min
Engstrom Carestation (GE Healthcare, Madison, USA) www.gehealthcare.com	6.0	Variable flow combined to continuous flow	Pediatric mode from 0.250 Kg to 7Kg	Proximal dual hotwire Anemometer flow sensor	Inspiratory flow trigger: 0.2-9L/min; Pressure flow trigger -10 to 0.25 cm H2O Cycling: 5-80% of the peak inspiratory flow. Default value: 25%	Instantaneous leak flow calculation: - Vleak = Volume leakage during the last 30s - Leakage: Vleak x (Instantaneous pressure / mean pressure during the last 30sec) Flow patient: measured flow-leak flow Patient flow is compensated according to the leakage. Compensation up to 50L/min	%

AVEA® Comprehensive (CareFusion, Yorba Linda, USA) www.carefusion.com	4.4	Variable flow	Neonatal mode 0.1-16Kg	Proximal hotwire flow sensor (a two stage variable orifice flow sensor is available too, for single use)	Inspiratory flow trigger 0.1-20L/min Peak inspiratory flow 0.4-30L/min. Bias flow 2-5L/min Pressure Support: 0-80 cm H2O PEEP:0-50 cm H2O Cycling: 5-45 % of peak inspiratory. Default value = 10%	No specific NIV algorithm but leak compensation, designed to compensate for loss of pressure, but not for inspiratory or expiratory triggers. To compensate the leaks, the ventilator maintains the set pressure by increasing the inspiratory flow if necessary.	%
G5, (Hamilton, Bonaduz, Switzerland) www.hamilton-medical.ch	2.0	Variable flow	Pediatric mode from 3 to 42Kg	Proximal pressure differential flow sensor;	Inspiratory flow trigger: 0.1-15L/min. Pressure trigger:0-10 cm H_2O Cycling: 1-70 % of the peak inspiratory flow. Default value 15%	Leak compensation already included in the PS mode; increase of the flow in order to compensate for the loss of the flow due to the leak.	% ml/cycle L/min
PB840 (Covidien, Mansfield, MA, USA) www.covidien.com	AH	Variable flow	Neonatal mode, from 300g to 7Kg; pediatric mode 3.5-35 Kg VTs delivered from 2ml	Distal flow sensors, two inspiratory and one expiratory. All are hot film anemometer	Inspiratory flow trigger 0.1-10 L/min neonatal; pediatric 0.2-20L/min Bias flow = Flow trigger + 1.5 L/min Cycling: 1-80% of the peak inspiratory flow. Default value = 25%	The leak compensation option adds flow to the breathing circuit to compensate for leaks. When enabled, the leak compensation function compensated for circuit leaks during exhalation in order to maintain PEEP and avoid auto-triggering. No flow is added if no leak is present. Accuracy for VTE changes. Compensated up to 10L/min for neonates and 40L/min for pediatrics Leak at PEEP: exhalation leak—the leak rate during exhalation at PEEP	% L/min
SERVO-i® (Maquet Critical Care AB, Solna, Sweeden) www.maquet.com	5.0	Variable flow	Pediatric mode from 0.5 to 30 Kg (NIV 3-30 Kg)	Ultrasonic flow sensor, located in the ventilator	Inspiratory flow trigger: 0 – 100 % (100% = 0,5 l/min); pressure trigger: -20 to 0 cmH_2O. Cycling: 1-70 %Peak inspiratory flow. Default value= 30%	NIV algorithm: Measurement (sampling rate 2000Hz) and compensation of the leak by increasing the inspiratory flow to maintain, up to 25L/min. Sustainment of the end expiratory pressure (minimum level 1-2 cmH_2O) during expiration and adjusted pressure during inspiration Inspiratory trigger becomes automatic: PEEP decrease of 1 cm H_2O during expiration or expiratory flow decrease of 6 ml during 100 ms.(first come – first serve principle)	%

In this table are presented the ten ventilators tested characteristics. Leaks in % are calculated as follows: VTI-VTE/VTI * 100