

PulmoWaves 2

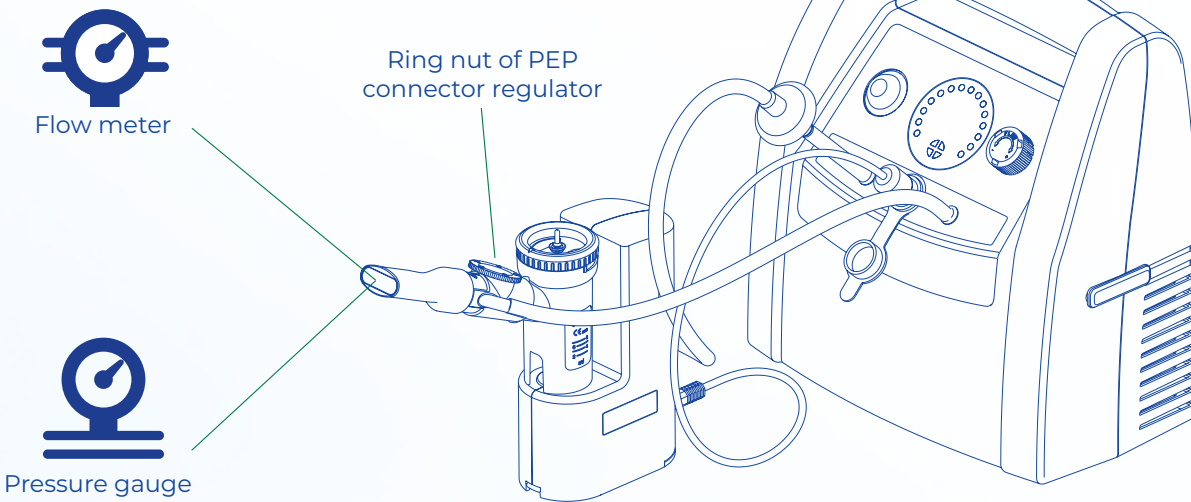


Table showing maximum and minimum flow and pressure values supplied by PulmoWaves 2 and combined with dispenser with PEP ring nut adjusted in the 5 available positions connector holes

Ring nut of PEP connector regulator	Max flow regulator		Min flow regulator	
	Hole diameter	Flow val.	Pressure val.	Flow val.
Ø 2	7.5 l/min	7 mbar	1.2 l/min	2 mbar
Ø 3	6.4 l/min	6 mbar	1.1 l/min	1 mbar
Ø 4	3.9 l/min	3 mbar	1.0 l/min	0 mbar
Ø 5	3.3 l/min	2 mbar	0.8 l/min	0 mbar
Ø 6	3.2 l/min	1 mbar	0.6 l/min	0 mbar

Technical specifications

Compressor	
Power supply/power	230 V~ 140 VA
Frequency	50Hz
Fuse	1x T2AL 250V
Noise (at 1 m)	55 dB(A) (approx.)

Code	VI06P00
Model	P0112EM F1000



Nebulizer device	
Power source	12 V
Nebulisation ml/min ⁽¹⁾	0.32 ml/min'
MMAD ⁽²⁾	4.26 µm
Breathable fraction <5µm ⁽²⁾	51.7 % (approx.)
Medication tray capacity	8 ml

⁽¹⁾ Data collected according to Flaem internal procedure I29-P07.5. ⁽²⁾ Data calculated on the basis of the values obtained with the Malvern Spraytec and compared with the values of the tests performed at the University of Parma.

Appliance dimensions	22 (L) x 11 (P) x 23 (H) cm
Weight	2.200 Kg
Bag size	27 (L) x 17 (P) x 25 (H) cm

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MADE IN ITALY

PulmoWaves 2

by **FLAEM**
PRO LINE



Medical device
for removing
tracheobronchial
secretions



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Medical Devices



Respiratory physiotherapy technology

Accumulation of secretions in certain parts of the human respiratory system can take place for different reasons.

For example, some thorax or abdominal surgery operations may require prolonged anaesthesia and force the patient to a long period of reduced mobility, thus conditioning its psychophysical recovery.

The reduced mobility of thorax and abdomen reduces the amplitude of breathing and, subsequently, oxygen supply and, at the same time, it causes secretions to increase or stagnate. Particularly debilitated patients often cannot cough properly to remove secretions.

In other cases, patients suffer from serious pathologies which cause an excessive production of secretions or mucociliary clearance anomalies. Examples include ciliary dyskinesia or cystic fibrosis with all related complications.

The treatment of airways for the removal of secretions, that is respiratory physiotherapy, can be executed with different pneumatic devices available on the market, which generally modify the patient's expiratory phase, in particular regulating the pressure or the volume of the air expired.

The positive expiratory pressure (PEP) mask is definitely widespread, in particular for the treatment of patients suffering from chronic bronchial obstruction (COPD).

Essentially, the PEP mask can be positioned on the face in order to enclose mouth and nose and is endowed with a one-way valve and an adjustable resistance which intercepts the expiratory output of the valve. Breathing with PEP allows the creation of a positive endobronchial pressure during the expiratory phase.

The effect of the positive pressure is to maintain the airways open for a longer period during the expiration phase, thus preventing bronchial collapse in areas with unstable and damaged walls. Therefore, temporary increase in pressure facilitates ventilation in most peripheral lung areas,

re-expansion of scarcely ventilated areas or not ventilated at all, and mobilisation of secretions from peripheral areas towards the centre of the bronchi.

In addition, there are many devices available on the market that exploit the same functional principle as PEP masks; in particular, they create a positive pressure during the expiratory phase for about two-thirds of the phase itself, thus allowing the patient to terminate expiration spontaneously, that is at atmospheric pressure.

Basically, it is composed of a mouthpiece with PEP function, but it is also equipped with a resistance that can be timely adjusted in terms of oscillatory mode.

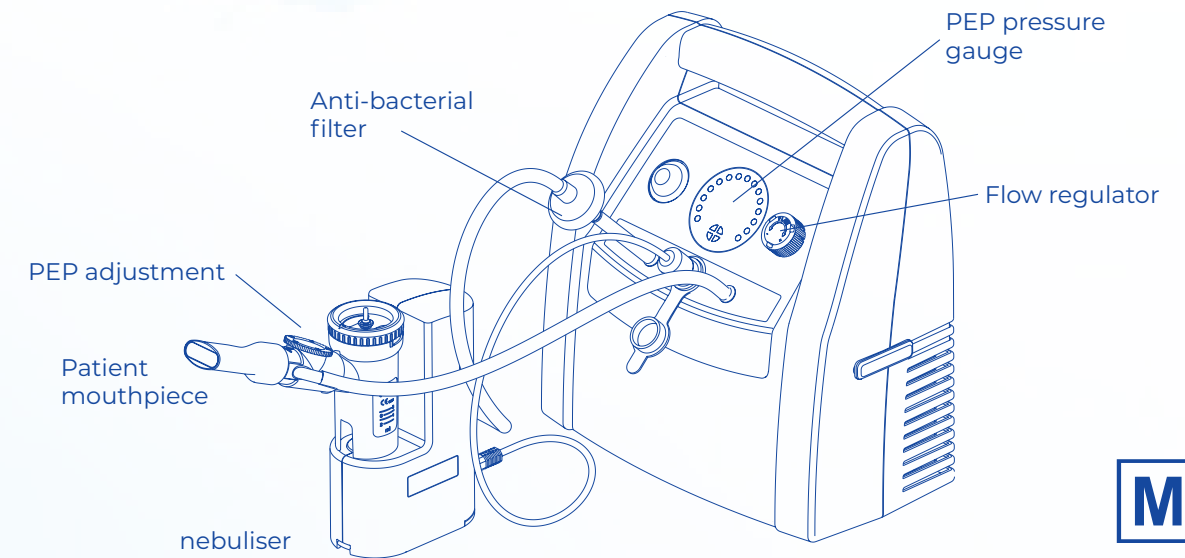
The resistance that obstructs patient expiration in an oscillatory way, determines the creation of an oscillatory positive expiratory pressure in the relevant airways, ranging between 10 and 20 cmH₂O, which facilitates the separation of mucus from bronchial walls.

Variations in positive expiratory pressure are slow, that is they have a reduced frequency below 15 Hz.

Another device is composed by an air compressor connected to a facial mask configured to accelerate the air expired by the patient, that is to increase air flow during expiratory phase, with the aim of creating a vacuum in airways to facilitate secretion separation.

As stated above, the solutions available on the market generally operate during the patient's expiratory phase, exploiting only one phase of breathing.

An integrated solution for removal of tracheobronchial secretions



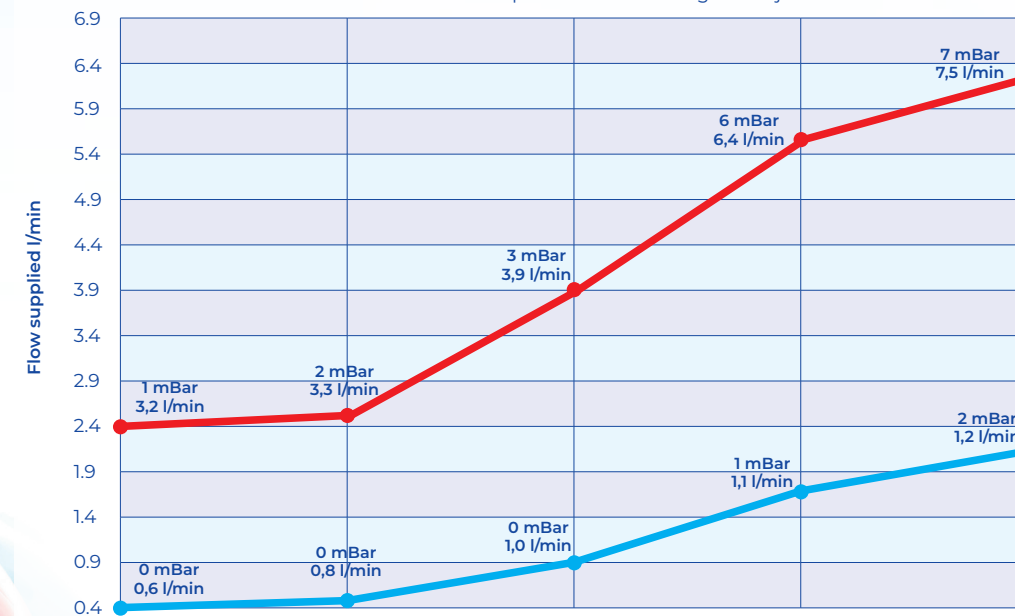
It is a system composed of a pneumatic compressor, a jet nebuliser and a dispenser with a PEP device.

The operation is based on the generation of vibrations by the pneumatic compressor that is automatically activated by the patient's inspiratory action. These vibrations, whose amplitude is adjustable via the flow regulator on the device console, enable the removal of mucus obstructions that clog the airways.

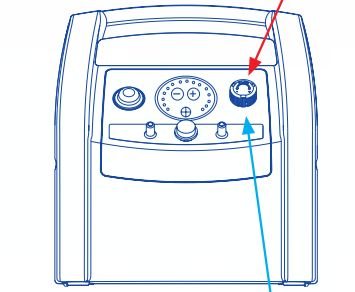
In order to prevent airways becoming dry during treatment, the flow inhaled by the patient also draws saline solution nebulized and produced by the jet nebulizer. The system features a 5-position adjustable PEP device for the management of the expiration phase; the intensity of flow can be measured by the digital pressure gauge on the device console.

PulmoWaves 2 can also be used without the nebuliser.

Graphical representation of maximum and minimum flow and pressure values supplied by PulmoWaves 2 and combined with dispenser with PEP ring nut adjusted in the 5 available



Vibrations amplitude with regulator set at max
Flow regulator set at Max



Flow regulator set at Min
Vibrations amplitude with regulator set at Min

