

# F&P 810™ Humidification System

designed for use with NIV to deliver increased humidity while reducing condensate



The F&P 810 Humidification System, incorporating the:

- F&P MR810 Heated Humidifier
  - F&P Evatherm Heated Breathing Tube
- provides a solution to humidity and condensate.

It is able to deliver increased levels of humidity and reduce condensation (rain out) compared to that provided by non-heated alternatives; improving patient care and outcomes.





## Maintaining the natural balance

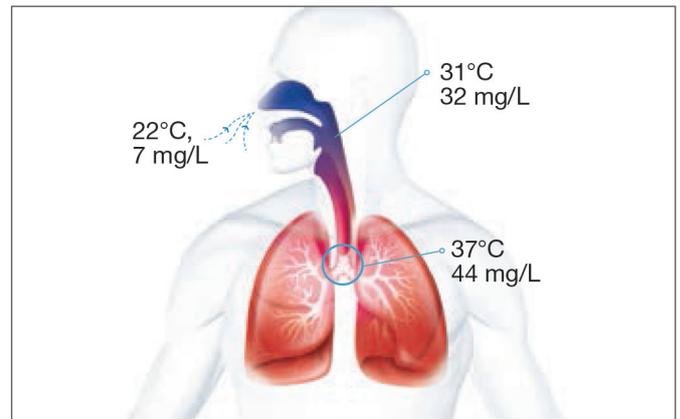
**The F&P 810 Humidification System, from the developers of ThermoSmart™ technology, is designed to deliver increased humidity while reducing condensate.**

### Physiological Humidity

The goal of airway humidification is to maintain and support the normal physiological environment in the airways. Healthy individuals breathing in ambient air, e.g. 22°C, 7 mg/L, warm and humidify the air to an average of 31°C, 32 mg/L with nasal breathing at the pharynx.<sup>1</sup>

Patients on NIV breathe at much higher pressures and flows than normal. They often have compromised airways, due to the nature of their respiratory failure,<sup>2</sup> and are less efficient at warming and humidifying gas.<sup>3</sup>

The F&P 810 Humidification System is designed to deliver physiological humidity, with the aim of making noninvasive ventilation (NIV) a more comfortable experience, increasing tolerance and avoiding complications.

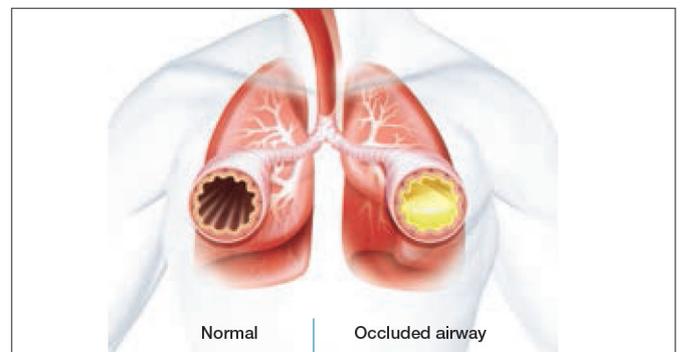


### Humidity to Avoid Complications of NIV Therapy

There are several factors associated with NIV that can compromise the patient's ability to heat and humidify inspired air. These include:

- Secretion removal problems<sup>4,5</sup>
- Oral breathing to reduce work of breathing<sup>6</sup>
- Increased respiratory rate as patient is short of breath<sup>5</sup>
- Fluid depletion due to increased respiratory effort and air leaks<sup>3,6</sup>

Providing physiological humidity aims to minimize these complications.

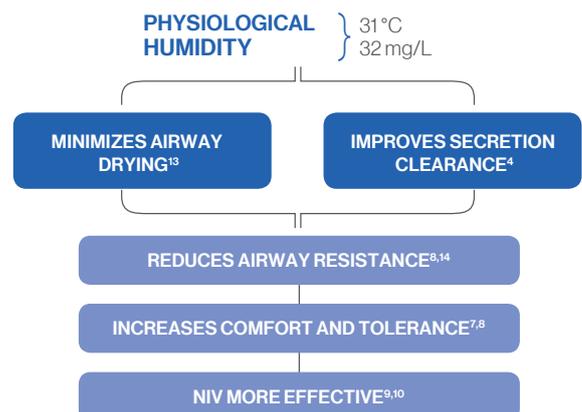


### Humidity to Increase Patient Tolerance

Lack of comfort due to low humidification and related complications can lead to poor patient compliance<sup>7,8</sup> and therefore loss of effectiveness.<sup>9,10</sup>

By heating and humidifying the gas flow to physiological levels, airway drying is minimized and secretion clearance is improved.<sup>11</sup>

This reduces airway resistance and leads to improved comfort and increased tolerance to NIV, making NIV more effective.<sup>11</sup>



# The F&P810 Humidification System

**Consists of the F&P MR810 Heated Humidifier and the F&P Evatherm Heated Breathing Tube. It is designed to deliver improved humidity while reducing condensation, using technology similar to ThermoSmart™ in CPAP devices, in NIV therapy applications.**

ThermoSmart technology in CPAP devices is the culmination of 45 years of experience as pioneers of heated humidification technology, first in intensive care and later in CPAP settings. It has been developed to deliver heated humidification at physiological levels while sensing and responding to changing environmental conditions.

## Delivering Humidity

The graph below illustrates the synergies between the two components of the F&P 810 Humidification System, allowing it to deliver heated humidification at physiological levels.

The MR810 Heated Humidifier can operate at three temperature and humidity levels, with the high setting providing increased levels of humidity. The F&P Evatherm Heated Tube can deliver higher levels of humidity than non-heated alternatives. When the two components work together in synergy, the F&P 810 Humidification System meets its objective of delivering physiological levels of humidity.

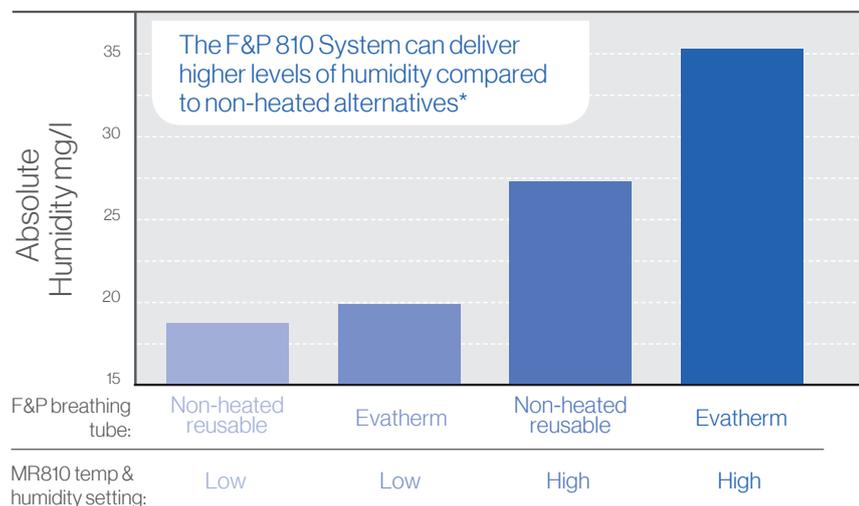


**F&P MR810  
Heated Humidifier**



**F&P 900MR810 Evatherm  
Heated Breathing Tube**

## Humidity performance



\* Based on Fisher & Paykel Healthcare internal testing results, this graph compares MR810 and Evatherm with MR810 and a non-heated reusable breathing tube.

When the MR810 is used with a non-heated breathing tube it is often set on the low setting to mitigate excessive condensate.

## F&P MR810 Heated Humidifier

**Designed for use with noninvasive ventilation and face mask oxygen, and working in synergy with the F&P Evatherm Breathing Tube, the F&P MR810 delivers a comfortable level of humidity to improve patient tolerance.**

- An active heated humidifier with the capacity to deliver physiological levels of humidity, when used in synergy with the F&P Evatherm Heated Tube.
- There are three incremental temperature levels (low, medium, high), allowing adjustment of the temperature and humidity for patient comfort. The humidity delivered is within ranges appropriate for face mask oxygen, noninvasive ventilation and to increase patient tolerance.
- A temperature sensor monitors room temperature to allow the humidifier to respond to changing conditions for better condensation control.
- The end of the heater wire adaptor is permanently attached to the MR810 with only one connection, ensuring the heater wire adaptor is not misplaced.



## F&P Evatherm™

**Developed as a component of the F&P 810 System, F&P Evatherm is a heated-wall, reusable breathing tube that ensures high levels of humidity are delivered to the patient while significantly reducing condensation.**

- A heated breathing tube, retaining heat along the tube so the intended level of humidity reaches the mask and patient, as well as working to minimize condensation.
- Can be used with many F&P humidification chambers and patient interfaces.
- Designed to be cleaned and reused.

A fully assembled breathing tube that does not require additional temperature probes or adapters.

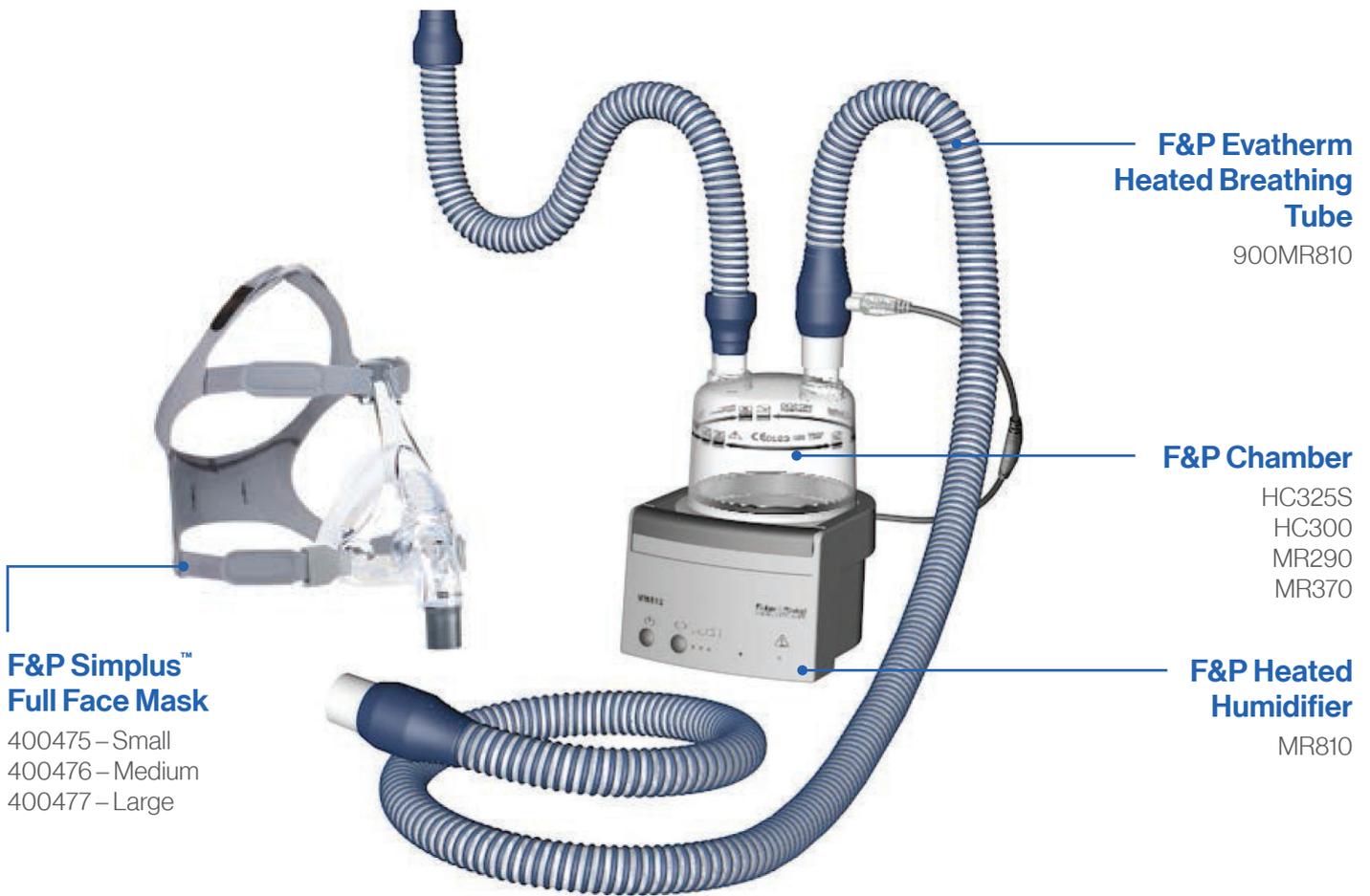


# Product specifications

MR810 Heated Humidifier		900MR810 Evatherm Breathing Tube	
<b>COMPONENTS &amp; COMPOSITION</b>			
<b>Pack components</b>	MR810 Humidifier, may contain breathing tubes (model dependant), User Instructions	<b>Pack components</b>	900MR810 Humidifier, may contain breathing tubes (model dependant), User Instructions
<b>Packaging dimensions and weight</b>	Length: 280mm Width: 210mm Height: 290mm Weight: 3.1kg - 3.6kg (model dependant)	<b>Packaging dimensions and weight</b>	Length: 390mm Width: 210mm Height: 425mm Weight: 2.8kg
<b>Manufacturing mode</b>	Produced in controlled working environment	<b>Manufacturing mode</b>	Produced in controlled working environment
<b>Humidifier dimensions</b>	94mm x 154mm x 125mm (no chamber fitted)	<b>Predominant materials</b>	Polyethylene elastomer, Polypropylene, Polysulfone and Styrene-Ethylene-Butylene-Styrene (S-EB-S) block thermoplastic elastomer Not made with natural rubber latex
<b>PERFORMANCE SPECS</b>			
<b>Supply voltage</b>	AXX: 230V~ ; GXX: 100V~ ; JXX: 115V~	<b>Resistance to flow at rated flow</b>	0.4 cmH <sub>2</sub> O @ 60 ± 1 L/min
<b>Frequency</b>	All Models: 50/60Hz	<b>Internal diameter</b>	19mm
<b>Supply current</b>	AXX: 0.8 A Max; GXX: 1.6 A Max; JXX: 1.8 A Max	<b>Ambient range</b>	18°C – 26°C
<b>Flow range</b>	5-60 L/min > 10 mg/L H <sub>2</sub> O	<b>Compliance</b>	4.6 mL/kPa/m
<b>Temperature and humidity settings</b>	Low, medium and high	<b>Humidifier compatibility</b>	Compatible with MR810 heated humidifier only
<b>Heater plate capacity</b>	150 W at nominal mains voltage	<b>Compressible volume</b>	640mL
<b>Heater plate thermal cutout</b>	93 ± 6°C	<b>Duration of use</b>	Discard tubes and all circuit components after 20 cleaning cycles, or six months after first use, whichever occurs earlier
<b>Heater wire supply</b>	22V~, 1.36 A, 30 W max	<b>Recommended gas source</b>	Air/Oxygen
<b>Humidifier weight</b>	2.0kg	<b>Carton quantity</b>	Box of 10
<b>Warm-up time</b>	Less than 60 minutes	<b>Interface connections</b>	ISO 5356-1 Conical Connectors
<b>Maximum heater plate temperature</b>	70°C		
<b>Electrical classification</b>	Class I, Type BF		
<b>REGULATORY</b>			
<b>Classification</b>	Au IIa, EU IIa, Canada II, USA II. For further regulatory information visit: <a href="http://www.fphcare.com/regulatory">www.fphcare.com/regulatory</a>		
<b>Country of origin</b>	New Zealand		
<b>Notified body</b>	TÜV SÜD Product Service GmbH, CE 0123		

# Set Up Guide

## Ventilator



### F&P Simplus™ Full Face Mask

400475 – Small  
400476 – Medium  
400477 – Large

### F&P Evatherm Heated Breathing Tube

900MR810

### F&P Chamber

HC325S  
HC300  
MR290  
MR370

### F&P Heated Humidifier

MR810

## References

1. Primiano FJ, Saidel G, Montague FJ, et al. Water vapour and temperature dynamics in the upper airways of normal and CF subjects. *Eur Respir J* 1988;1(5):407-14.
2. Cosio BG, R R-R. Treatment of chronic obstructive pulmonary disease: acute and chronic. *Noninvasive ventilation and weaning, principles and practice 2010*; Chapter 21 (Editors: Elliott M, Nava S, Schonhofer B.): Published Hodder Arnold, London.
3. Esquinas Rodriguez AM, Scala R, Soroksky A, et al. Clinical review: Humidifiers during non-invasive ventilation - key topics and practical implications. *Crit Care* 2012;16(1):203.
4. Kilgour E, Rankin N, Ryan S, et al. Mucociliary function deteriorates in the clinical range of inspired air temperature and humidity. *Intensive Care Med* 2004;30:1491-4.
5. Hill N. Complications of noninvasive positive pressure ventilation. *Resp Care* 1997;42(4):432-42.
6. Oto J, Nakataki E, Okuda N, et al. Hygrometric properties of inspired gas and oral dryness in patients with acute respiratory failure during noninvasive ventilation. *Respir Care* 2014;59(1):39-45.
7. Massie C, Hart R, Peralez K, et al. Effects of humidification on nasal symptoms and compliance in sleep apnea patients using continuous positive airway pressure. *Chest* 1999;116(2):403-8.
8. Tuggey JM, Delmastro M, Elliott MW. The effect of mouth leak and humidification during nasal non-invasive ventilation. *Resp Med* 2007;101(9):1874-9.
9. Borel JC, Pepin JL, Pison C, et al. Long-term adherence with non-invasive ventilation improves prognosis in obese COPD patients. *Respirology (Carlton, Vic)* 2014.
10. Carlucci A, Richard J-C, Wysocki M, et al. Noninvasive versus conventional mechanical ventilation: an epidemiologic survey. *American journal of respiratory and critical care medicine* 2001;163(4):874-80.
11. Branson RD, Gentile MA. Is humidification always necessary during noninvasive ventilation in the hospital? *Respiratory Care* 2010;55(2):209-16.
12. Oto J IH, Nishimura M. Clinical factors affecting inspired gas humidification and oral dryness during noninvasive ventilation. *J Crit Care* 2011;26(5):535.e9-e15.
13. Moloney E, O'Sullivan S, Hogan T, et al. Airway dehydration: a therapeutic target in asthma? *Chest* 2002;121(6):1806-11.

For more information please contact us at:

Air Liquide Healthcare, Stratus House, Unit 1 IDA College Park, Blanchardstown Road North, Blanchardstown, Dublin 15, D15 PEC4.

Tel: +353 (0)1 809 1800 Freephone: 1800 24 02 02 (ROI only) 0800 328 5875 (NI only)

Fax: +353 (0)1 829 3966 Email: [healthie@airliquide.ie](mailto:healthie@airliquide.ie) Website: [www.airliquidehealthcare.ie](http://www.airliquidehealthcare.ie)