

REMstar® Heated Humidifier



The REMstar Heated Humidifier is an accessory for positive pressure ventilation systems to provide moisture to the patient circuit. It is intended for use with adult patients (>30 kg), in the home or hospital/institutional environment, who use mask-applied positive pressure ventilation therapy.

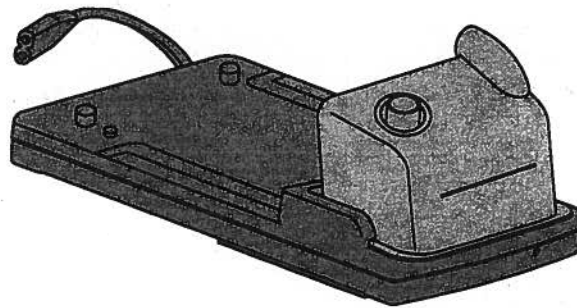


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WARNINGS AND CAUTIONS

CAUTION!

US federal law restricts this device to sale by or on the order of a physician.

WARNINGS! Indicates the possibility for injury to the user or the operator.

Use the humidifier only for its intended use as described in this manual. Use only accessories recommended by Respironics.

Never operate the humidifier if any of the parts are damaged, if it is not working properly, or if the humidifier has been dropped or mishandled. Do not use the humidifier if the water chamber is leaking or damaged in any way. Have any damaged parts replaced before continuing use.

Never touch the heater plate unless the humidifier is unplugged and the plate has cooled down.

This equipment is not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

Periodically inspect the power cord for signs of wear or damage. Replace the power cord if necessary.

When installing the chamber, do not allow any water to spill into the PAP device.

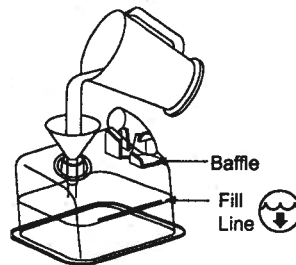
CAUTIONS! Indicates the possibility of damage to the device.

If fluids are spilled onto the humidifier platform, unplug the power cord from the AC wall outlet and allow the humidifier platform to drain and dry before using.

Take precautions to protect furniture from water damage.

Do not fill above line.

Make sure the baffle is securely in place.

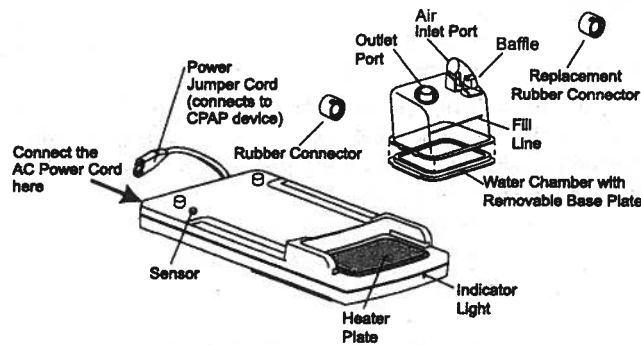


IMPORTANT!

Read all instructions before using the humidifier.

Use only with Respironics therapy devices with instructions that specify the use of this humidifier.

FEATURES



Power Cord	Use the power cord included with your therapy device.
Power Jumper Cord	Plug this cord into the AC inlet on the therapy device.
Heater Plate	Warms the water in the water chamber.
Indicator Light	When lit, this green light indicates that the heater plate has been turned on.
Air Inlet Port	Connect to the outlet port on the therapy device.
Outlet Port	Connect the flexible tubing here (included with your therapy device system).
Water Chamber	The removable water chamber holds the water for humidification. It has a removable base plate for easy cleaning.
Fill Line	This indicates the maximum water level for safe operation.
Baffle	This minimizes splashing back into the unit.
Sensor	Do not block this sensor. The humidifier will not operate unless it can detect that the therapy device is positioned correctly.
Rubber Connector	Connects the air outlet on the therapy device with the inlet port on the water chamber. Latex-free.
Replacement Rubber Connector	This can be used if the rubber connector becomes damaged. Latex-free.

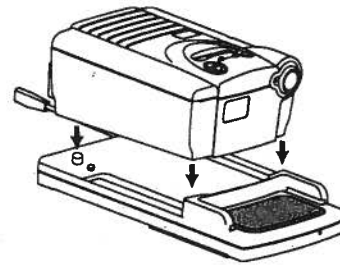
SYMBOLS

	Maximum Fill Line
	Hot Surface
	Type BF Applied Part
	Class II (Double Insulated)
IPX0	Ordinary Equipment
	Attention, consult accompanying documents
	European CE Marking

SETUP

1. Place the therapy device on the humidifier platform. Position the device so that the four feet match up with the humidifier base.

Note: *If you are using a therapy device without an external AC power supply, follow the instructions in Step 2a. If you are using a therapy device with an external AC power supply, follow the instructions in Step 2b.*

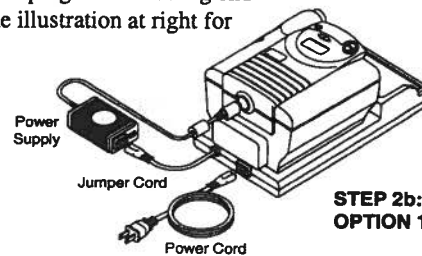


- 2a. Connect the humidifier's power jumper cord to the AC inlet on the therapy device. Plug the therapy device's power cord into the AC connector on the humidifier. Plug the remaining end of the power cord into an AC outlet. (See figure at right.)

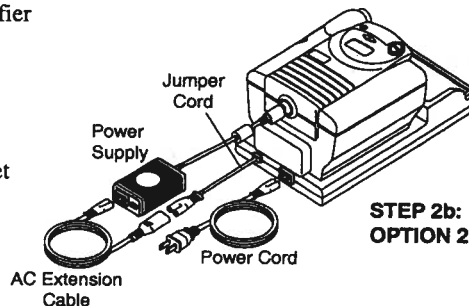


- 2b. You have two options for connecting the humidifier to a device that has an external AC power supply:

- **Option 1** – Connect the humidifier's power jumper cord to the inlet on the external AC power supply, and then plug the power supply's cord into the power inlet on the back of the therapy device. Plug the therapy device's power cord into the AC connector on the humidifier, and then plug the remaining end of the power cord into an AC outlet. See the illustration at right for an example of this setup.

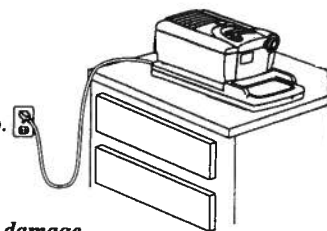


- **Option 2** – Some devices, such as the BiPAP Pro 2, include an AC extension cable with the system. You can use this AC extension cable to increase the length of the humidifier's jumper cord to allow the external AC power supply to be placed on the floor when connecting the humidifier to the device. To connect the humidifier using the extension cable:



- a. Plug the large connector end of the extension cable into the humidifier's jumper cord, and then plug the other end of the extension cable into the inlet on the external AC power supply.
- b. Plug the power supply's cord into the power inlet on the back of the therapy device.
- c. Plug the therapy device's power cord into the AC connector on the humidifier, and then plug the remaining end of the power cord into an AC outlet. See the illustration at right for an example of this setup.

3. Place the therapy device and humidifier platform on a firm, flat surface at a level lower than your sleeping position.



CAUTION! *Take precautions to protect furniture from water damage.*

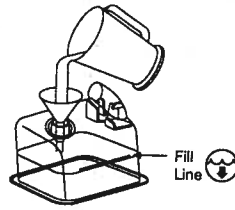
CAUTION! *Do not turn the humidifier on without the water chamber installed.*

DAILY USE

1. Rinse the chamber with water. Fill the chamber to the fill line with distilled water (approx. 1-2/3 cups or 400 ml). Use only distilled water in chamber.

CAUTION! Do not overfill the water chamber. Damage to the therapy device may occur.

CAUTION! Do not allow the water chamber to sit for any length of time after it has been filled with water. Immediately install the chamber in the humidifier (step 2). Allowing water to sit in the chamber (when it is not connected to the humidifier) may cause the chamber to separate from the bottom plate and may cause water leakage.

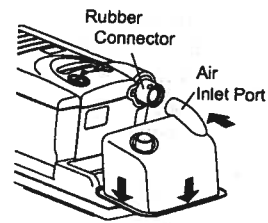


2. Slide the rubber connector over the air outlet on the therapy device. Press down on the spring-loaded heater plate with the water chamber and slide the chamber into place. Make sure the chamber's air inlet port fits securely into the rubber connector.

CAUTION! When installing the chamber, do not allow any water to spill into the PAP device.

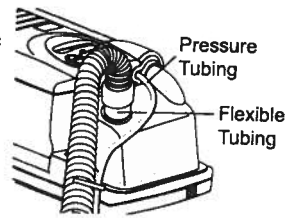
CAUTION! Do not touch the heater plate with your hands.

CAUTION! Avoid moving the humidifier when the water chamber has water in it.



3. Connect the flexible tubing (included with your therapy device system) to the outlet port on the water chamber. If pressure tubing is used with your therapy device, connect the pressure tubing to the pressure outlet on the front of the device.

IMPORTANT! Before each use, examine the flexible tubing for any kinks, damage, or debris. If necessary, clean the tubing to remove the debris. Replace any damaged tubing.



4. Preheat the water before turning on the airflow and going to bed. To turn on the humidifier, press and hold the humidifier button on the therapy device until the green indicator light on the platform turns on.



5. The ideal humidity setting depends on room temperature and humidity. Initially a setting of 2 is recommended. You can adjust this setting at any time. Press and hold the humidifier button on the therapy device. The humidifier symbol and setting will appear. Press the humidifier or ramp buttons to change the setting.



IMPORTANT! If the airflow is not turned on after 20 minutes, the preheat mode will end and the humidifier will turn off. If you do not wish to preheat the water, you can press the humidifier button after the airflow is turned on.

IMPORTANT! When the airflow is turned off, the humidifier will automatically shut off. If you restart the airflow, and heated humidification is desired, you must press the humidifier button to reactivate the humidifier.

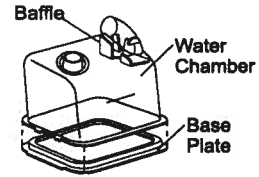
CLEANING

Water Chamber

WARNING! Empty and clean the water chamber daily to prevent mold and bacteria growth.

WARNING! Allow the water in the chamber to cool to room temperature before removing the chamber from the humidifier.

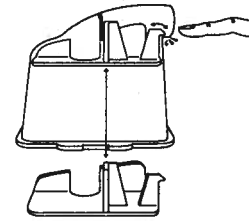
1. Turn the therapy device off and allow approximately 15 minutes for the heater plate and water to cool.
2. Disconnect the tubing from the water chamber. Press down on the water chamber and slide it out of the humidifier platform. Empty any remaining water.
3. Gently remove the base of the chamber with your hands, being careful not to damage the rubber seal.
4. Remove the baffle (see instructions below).
5. Wash all parts in the dishwasher or in a solution of warm water and a mild dishwashing detergent. Rinse the parts with clean water and allow them to air dry.
6. Reassemble and fill the water chamber. Inspect the water chamber for any leaks or damage. Replace the water chamber if any damage is present.



Baffle Instructions

To Remove

1. After carefully removing the base of the chamber, reach in and hold the baffle steady.
2. Slide a finger into the air inlet port and gently push on the hook tab to release the baffle. Pull down gently on the baffle to remove it from the water chamber.



To Install

1. Slide the baffle into the water chamber with the hook tab facing the air inlet port. Make sure the 'T' shaped protrusion is positioned in front of the air inlet port wall.
2. Gently push the baffle into place until the hook tab 'snaps' into the air inlet port.

Humidifier Platform

WARNING! To avoid electrical shock, disconnect the power cord and power jumper cord before cleaning the humidifier platform. DO NOT immerse the humidifier platform or power jumper cord in any fluids.

1. Clean the humidifier platform by wiping it with a damp cloth. Allow the platform to air dry before reconnecting the power cord.
2. Inspect the humidifier platform and power jumper cord for any damage and replace it if necessary.

SERVICE

The humidifier does not require routine servicing.

WARNING! If the humidifier malfunctions or if the green indicator light starts flashing, contact your home care provider immediately. Never attempt to open the humidifier's enclosure.

When necessary, dispose of the humidifier in accordance with local regulations.

SPECIFICATIONS

Size	Dimensions: 13.25" x 6.5" x 2.125" (33.7 x 16.5 x 5.4 cm) Weight: < 1.85 lbs. (< .84 kg)												
Water Capacity	1 2/3 cups (400 ml) at recommended water level												
Product Use, Transport, and Storage	<table><thead><tr><th></th><th>Operation</th><th>Transport & Storage</th></tr></thead><tbody><tr><td>Temperature:</td><td>41 to 95° F (5 to 35° C)</td><td>-4 to 140° F (-20 to 60° C)</td></tr><tr><td>Humidity: condensing</td><td>15 to 95% Non-condensing</td><td>15 to 95% Non-</td></tr><tr><td>Atmospheric Pressure:</td><td>76.7 to 102 kPascals</td><td>N/A</td></tr></tbody></table>		Operation	Transport & Storage	Temperature:	41 to 95° F (5 to 35° C)	-4 to 140° F (-20 to 60° C)	Humidity: condensing	15 to 95% Non-condensing	15 to 95% Non-	Atmospheric Pressure:	76.7 to 102 kPascals	N/A
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Standards Compliance	<p>This humidifier is designed to conform to the following standards:</p> <ul style="list-style-type: none">IEC 60601-1 General Requirements for Safety of Medical EquipmentEN ISO 8185:1998 General Requirements for Humidification Systems												
Power Requirements	AC Power Consumption: 100 - 240 VAC, 50/60 Hz, 1.7 A max.												
Type of Protection against Electric Shock	Class II Equipment												
Degree of Protection against Electric Shock	Type BF Applied Part												
Equipment Type	IPX0 - Ordinary Equipment												
Heater Settings	1 to 5 (104° to 149° F / 40° to 65° C)												
Pressure Drop w/ Humidifier	(max.) 0.2 cm H ₂ O at 60 LPM flow												
Humidity Range	10 to 40 mg H ₂ O/L												
LED Type	Type 1 per IEC 60825-1												

TRAVELING WITH THE SYSTEM

Packing the System

When you are traveling, the optional CPAP carrying case can be used for carry-on luggage only. The carrying case will not protect the humidifier if it is stored as checked baggage. **CAUTION!** *Always empty the water chamber before packing the humidifier.*

Security Stations

For ease at security stations, there is a note on the bottom of the humidifier stating that it is medical equipment. It may be helpful to bring this manual along with you for review by security personnel.

DC Power

This humidifier is suitable for use with typical DC-to-AC inverters and UPSs (uninterruptible power supplies). (300 watts minimum)

Checking the Power Cord

If you are traveling to a country with a line voltage different than the one you are using, an international plug adapter may be required to make your power cord compatible with the power outlets of that country.

IMPORTANT!

For more information, contact Respironics Customer Service department at 1-800-345-6443 (USA and Canada) or 1-724-387-4000.

WARRANTY

Respironics, Inc.® warrants that this humidifier shall be free from defects of workmanship and materials and will perform in accordance with the product specifications for a period of two (2) years from the date of sale by Respironics, Inc. to the dealer. If the product fails to perform in accordance with the product specifications, Respironics, Inc. will repair or replace, at its option, the defective material or part. Respironics, Inc. will pay customary freight charges from Respironics, Inc. to the dealer location only. This warranty does not cover damage caused by accident, misuse, abuse, alteration and other defects not related to material or workmanship. To exercise your rights under this warranty, contact your local, authorized Respironics, Inc. dealer or Respironics.

EMC INFORMATION

Guidance and Manufacturer's Declaration - Electromagnetic Emissions

The REMstar Heated Humidifier is intended for use in the electromagnetic environment specified below. The user of this device should make sure it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment - Guidance
RF emissions CISPR 11	Group 1	The REMstar Heated Humidifier uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The REMstar Heated Humidifier is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ Flicker emissions IEC 61000-3-3	Complies	

EMC INFORMATION

Guidance and Manufacturer's Declaration - Electromagnetic Immunity


The REMstar Heated Humidifier is intended for use in the electromagnetic environment specified below. The user of this device should make sure it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment - Guidance
Electrostatic Discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast Transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input-output lines	±2 kV for supply mains ±1 kV for input/output lines	Mains power quality should be that of a typical home or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV for common mode	Mains power quality should be that of a typical home or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	Mains power quality should be that of a typical home or hospital environment.
NOTE: U_T is the a.c. mains voltage prior to application of the test level.			

EMC INFORMATION

Guidance and Manufacturer's Declaration - Electromagnetic Immunity

The REMstar Heated Humidifier is intended for use in the electromagnetic environment specified below. The user of this device should make sure it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment - Guidance
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical home or hospital environment.
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	3 Vrms 3 V/m	<p>Portable and mobile RF communications equipment should be used no closer to any part of the device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance $d = 1.2 \sqrt{P}$ $d = 1.2 \sqrt{\frac{P}{f}}$ 80 MHz to 800 MHz $d = 2.3 \sqrt{\frac{P}{f}}$ 800 MHz to 2.5 GHz</p> <p>where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,^a should be less than the compliance level in each frequency range.^b</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
<p>NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p>NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.</p> <p>^a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the device is used exceeds the applicable RF compliance level above, the device should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the device.</p> <p>^b Over the frequency range 150 kHz to 80 MHz, the field strengths should be less than 3 V/m.</p>			

EMC INFORMATION

Recommended Separation Distances between Portable and Mobile RF Communications Equipment and This Device

The REMstar Heated Humidifier is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of this device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the REMstar Heated Humidifier as recommended below, according to the maximum output power of the communications equipment.

Rated Maximum Power Output of Transmitter W	Separation Distance According to Frequency of Transmitter m		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

Note 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.



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