



InH2™ Heated Humidifier

User Manual

CE 0123

The InH2™ Heated Humidifier is designed only for use with specific BMC RESmart® CPAP/Auto CPAP or BPAP devices. Do not use InH2™ with any other devices. The humidifier moistens the air delivered by the BMC RESmart® CPAP/BPAP devices. The InH2™ Heated Humidifier is only used for single patient and must not be re-used on another person. This is to avoid the risk of cross-infection. The InH2™ Heated Humidifier is not intended for use with a patient whose upper airways have been bypassed.

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Warnings & Cautions

IMPORTANT!

- Read all instructions before using the humidifier.
- Use only with BMC RESmart devices whose instructions specify the use of this humidifier.

CAUTIONS!

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

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 BMC.
- 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 if necessary.
- Do not operate the device in direct sunlight or near a heating appliance because these conditions can increase the temperature of the air coming out of the device.
- When humidifier is used outside the specified ambient temperature range or humidity range, the performance of humidifier will be compromised.

Symbols



Attention, Consult
Accompanying Documents



Type BF Applied part



Class II (Double Insulated)

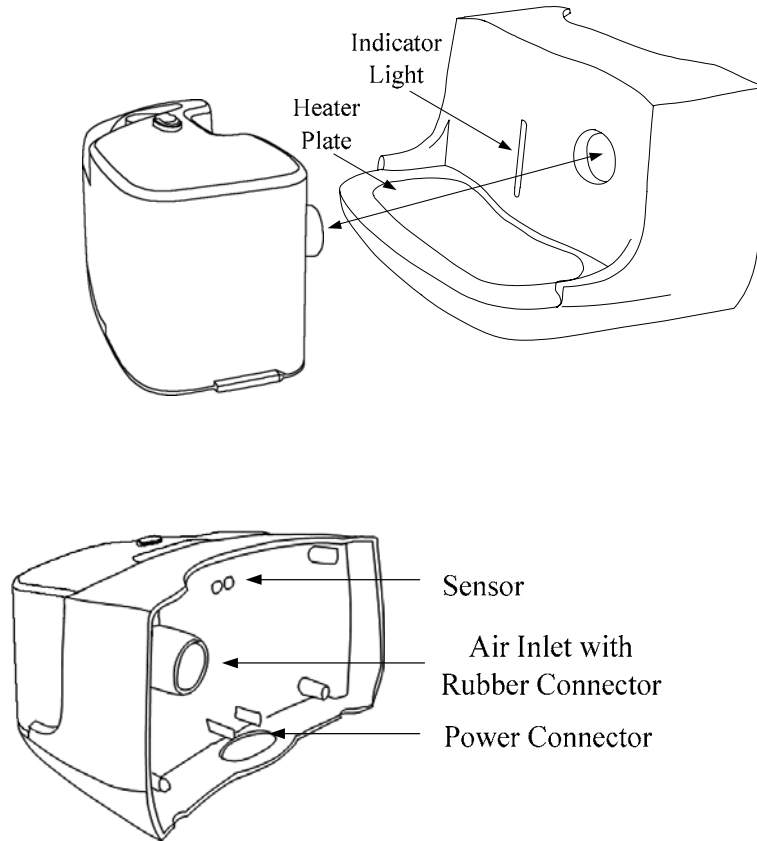
--- DC Power

IPX1 Drip-Proof, Vertical



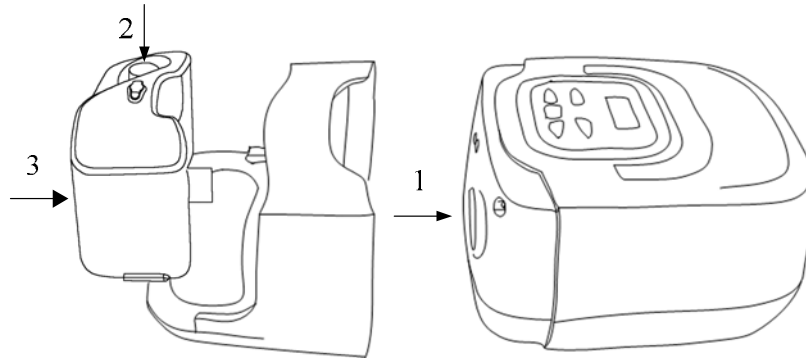
0123 European CE Declaration
of Conformity

Features



- Power Connector:** Plug this connector into the power outlet on the BMC RESmart Device.
- Heater Plate:** Warms the water in the water chamber.
- Indicator Light:** When lit, this indicates that the heater plate has been turned on.
- Air Inlet with Rubber Connector:** Connect to the outlet port on the RESmart device.
- Outlet Port:** Connect the flexible tubing (coaxial 22 mm) here.
- Water Chamber:** The removable water chamber holds the water for humidification. It has a silica gel cover to outflow the water in cleaning.
- Fill Line:** This indicates the maximum water level for safe operation.
- Sensor:** Do not block this sensor. The humidifier will not operate unless it can detect that the RESmart device is connected correctly.

Set Up



1. Connect the Humidifier to the RESmart device. Make sure they are connected completely.
2. Place the RESmart device and humidifier on a firm, flat surface at a level lower than your sleeping position.

CAUTION!

Do not turn the humidifier on without the water chamber installed.

CAUTION!

Take precautions to protect furniture from water damage.

Daily Use

1. Fill the chamber to the fill line with water (approx. 350 ml) from the outlet port. Distilled water is recommended. Do not overfill the water chamber.

CAUTION! *Always remove the chamber from the humidifier before filling with water.*

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

3. Connect the flexible tubing to the outlet port on the water chamber.

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

4. Press the humidifier button on the RESmart device after CPAP is blowing. The humidifier key will be lighted and the yellow indicator light on the humidifier will turn on.

5. The ideal humidity setting depends on room temperature and humidity. Initially, a setting of 3 is recommended. You can adjust this setting at any time. Please adjust the humidifier setting according to the CPAP User Manual.

IMPORTANT! *When the air flow is turned off, the humidifier will automatically shut off. If you restart the air flow within 30 minutes, the humidifier will be reactivated automatically.*

Cleaning

The water chamber should be cleaned daily or after each use.

WARNING! *Emptying and cleaning the water chamber daily will help to prevent mold and bacteria growth.*

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

WARNING! *To avoid electrical shock, disconnect the power cord of RESmart device before cleaning the humidifier. DO NOT immerse the humidifier into any fluids.*

Water Chamber

1. Turn the RESmart 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.
3. Open the silica gel cover of water chamber and discard any remaining water. Fill a solution of warm water and a mild dishwashing detergent into the chamber, cover the silica gel cover, rock the chamber a few minutes, and then outflow the solution. Rinse the chamber several times with clean water and allow to air dry.
4. Fill the water chamber and close the silica gel cover. Inspect the water chamber for any leak or damage. Replace the water chamber if any damage is present.

Humidifier Platform

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

Silicone Tube of Humidifier

1. Clean the Silicone Tube by wiping with an alcohol cotton stick. Allow to air dry.

Service

The humidifier does not require routine servicing.

If the humidifier malfunctions, contact your home care provider immediately. Never attempt to open the humidifier's enclosure. If necessary, contact your local authorized dealer or BMC Medical Co., Ltd. for technical support and documents.

Specifications

Size **Dimensions:** 120 × 194 × 112 mm
 Weight: < 0.8 kg

Water Capacity > 350 ml at recommended water level

Product Use, Transport and Storage

	Operation	Transport and Storage
Temperature:	5 to 30°C	-20 to 55°C
Humidity:	≤ 80% Non-condensing	≤ 93% Non-condensing
Atmospheric Pressure:	860 to 1060 hPa	500 to 1060 hPa

Power Requirements

24V DC 1.0A max

Type of Protection Against Electric Shock

Class II Equipment

Degree of Protection Against Electric Shock

Type BF Applied Part

Degree of Protection Against Ingress of Water

IPX1 –Drip-Proof, Vertical

Heater Settings

1 to 5 (104 to 149° F / 40 to 65°C)

Maximum Operating Pressure

30 hPa

Pressure Drop w/ Humidifier

<0.5 hPa at 60 LPM flow

Maximum Delivered Gas Temperature

<40°C

Humidity Range

10 to 45 mg H₂O/L

Disposal

When necessary, dispose of the device and accessories in accordance with local regulations.

Traveling With the System

Packing the System

When traveling, the optional CPAP carrying case is for carry-on luggage only. The carrying case will not protect the humidifier if it is put through checked baggage.

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 security personnel.

EMC Requirements

Guidance and manufacturer's declaration - electromagnetic emissions		
The RESmart is intended for use in the electromagnetic environment specified below. The user of the RESmart should ensure that it is used in such an environment.		
Emissions Test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1, Class B	The RESmart is suitable for use in all establishments including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
RF emissions CISPR 11	Group 1, Class B	
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations /flicker emissions IEC 61000-3-3	Class D	

Guidance and manufacturer's declaration - electromagnetic immunity


The RESmart is intended for use in the electromagnetic environment specified below. The user of the RESmart should make sure that 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	Floor 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 power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical home or hospital.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical home or hospital.
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 s	<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 s	Mains power quality should be that of a typical commercial or hospital environment. If the user of the RESmart requires continued operation during power mains interruptions, it is recommended that the RESmart be powered from an uninterruptible power supply or from a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	0.3 A/m	If the pressure deviates more than is indicated in the device specification, it may be necessary to position the RESmart further from sources of power frequency magnetic fields. The power frequency magnetic field should be measured in the intended installation location to ensure that it is sufficiently low.

NOTE: U_T is the AC mains voltage prior to application of the test level.

Guidance and manufacturer's declaration - electromagnetic immunity

The RESmart is intended for use in the electromagnetic environment specified below. The user of the RESmart should make sure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	<p>Portable and mobile RF communications equipment should be used no closer to any part of the RESmart, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance $d=1.2\sqrt{P}$</p> <p>$d=1.2\sqrt{P}$ 80 MHz to 800 MHz $d=2.3\sqrt{P}$ 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 transmitter, 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> 
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applied.

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

^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 RESmart is used exceeds the applicable RF compliance level above, the RESmart should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the RESmart.

^b Over the frequency range 150 kHz to 80 MHz, the field strengths should be less than 3 V/m.

Warranty

BMC Medical Co., Ltd. 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 one (1) year from the date of sale by BMC Medical Co., Ltd. to the dealer. If the product fails to perform in accordance with the product specifications, BMC Medical Co., Ltd. will repair or replace, at its option, the defective material or part. BMC Medical Co., Ltd. will pay customary freight charges from BMC Medical Co., Ltd. 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 dealers or:

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