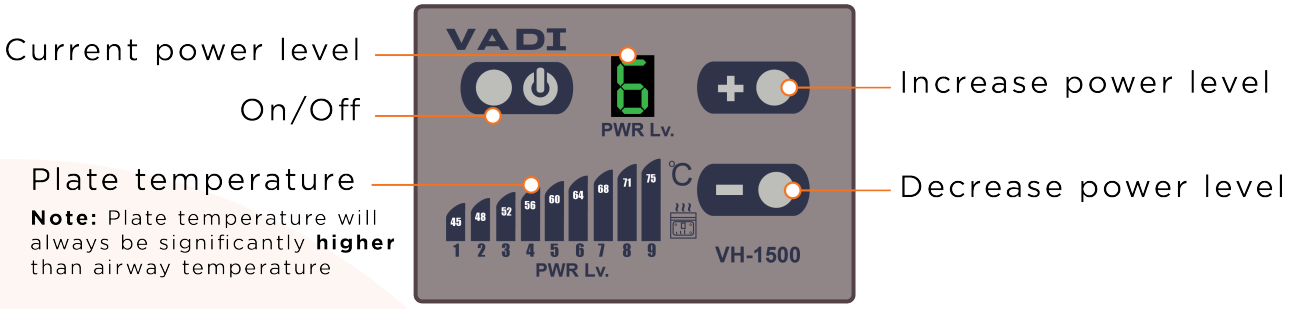
GRADIAN CCV: HEATED HUMIDIFIER

User Interface



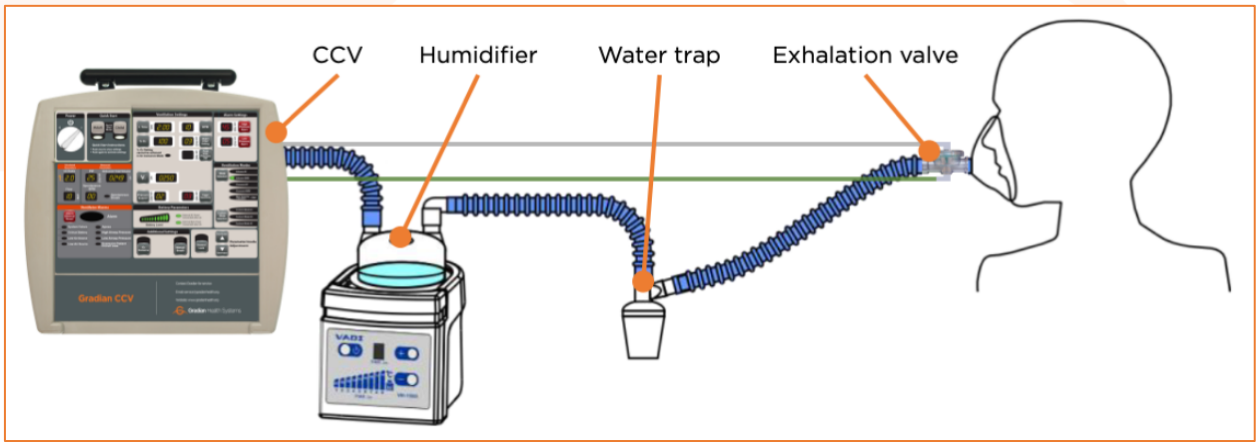
Assembly and Use

1. Ensure that the humidifier is securely mounted to the Workstation and connected to power, and that all accessories are cleaned and sterilized.
2. Fill the water chamber with distilled water, up to the maximum level mark.
3. Assemble the circuit limbs so that the water trap is between the humidifier and the exhalation valve, as shown below.
4. Turn the humidifier heater on, and allow it to warm up.
5. Check the breathing circuit and exhalation valve to verify that there is an appropriate amount of humidification, and adjust the power level as needed:

   → If no humidity is visible, increase the power level.

   → If excessive condensate forms in the circuit, reduce the power level.

   Note: The temperatures indicated for each power level signify the heater plate temperature; the **airway temperature** is generally about **half as much.**
6. Monitor the breathing circuit and water chamber during ventilation; ensure that there is water in the water chamber, and drain the water trap as needed to ensure that it does not overflow.
7. Disinfect or autoclave the water chamber, circuit, and water trap after each use.



Principle of Operation

The Heated Humidifier utilizes a temperature-regulated water chamber to add water vapor and heat to inspiratory gas. Heated Humidifiers provide more humidification than passive Heat/Moisture Exchangers (HMEs), and generally deliver an absolute humidity level of 33-44 mg H_2O/L (at 34-41°C) at the patient exhalation valve.

Indications for Heated Humidification

Heated humidification is recommended for every patient receiving invasive ventilation and is also suggested for non-invasive ventilation (NIV). The longer the anticipated duration of ventilation, the more important heated humidification becomes.

Precautions and Warnings

- Position the humidifier below the bed, so that any condensate drains away from the patient.
- Position the water trap so that it is at the lowest point of the breathing circuit, and check it frequently to avoid overflowing.
- Monitor the patient circuit to assess whether adequate humidity is being delivered, particularly when ventilating at higher flow rates (>40 LPM).
- To reduce the chance of infection, always appropriately dispose of condensate collected in the water trap and ensure that the water chamber is cleaned regularly.
- Temperatures on the PWR Lv. chart correspond to the temperature of the heater plate; the airway temperature is usually 40-60% cooler.
- Never touch the heater plate of the humidifier when it is hot.
- Always fill the water chamber with distilled water.
- Do not fill the water chamber above the maximum level mark (300 cc).
- Always use appropriate mains power (200-240 VAC).

Alarms and Safety Features

- **Over-Heat Protection**: If the heater plate temperature exceeds 95°C, the High Temperature Alarm will activate, the display will read “H”, and the heater will automatically shut off to protect the patient.
- **Low Temperature Alarm**: When the temperature set is less than 5°C, the alarm will activate, and power may be discontinued at any time.